ANIMAL HEALTH SURVEILLANCE

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PREFACE

This issue of *Animal Health Surveillance Quarterly* contains articles on a variety of topics. These include information about an international emergency animal disease training workshop, a report on the Quadrilateral group meeting, an update on the activities of the Australian Biosecurity Cooperative Research Centre for Emerging Infectious Disease, details of staff changes that have recently occurred at Animal Health Australia, an outline of the requirements to report disease in companion animals and wildlife, and a description of changes to the National Animal Health Information System database and reporting mechanism.

Other topics 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 *Animal Health Surveillance Quarterly* 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 (at http://www.animalhealthaustralia.com.au/status/nahis.cfm).

Gardner Murray, Australian Chief Veterinary Officer

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Australian Biosecurity CRC update

Epidemiology training for Iraqi veterinarians

The Australian Biosecurity Cooperative Research Centre for Emerging Infectious Disease (AB-CRC), in collaboration with its partner organisations AusVet Animal Health Services Pty Ltd, Murdoch University and the Department of Agriculture Western Australia, hosted five senior veterinarians from the Iraqi Ministry of Agriculture for a training program in epidemiology. The seven-week program was titled *Focused Technical Training Program in Epidemiology*. It took place in Perth, the south-west region of Western Australia, Orange, Canberra and Toowoomba during November and December 2005.

The training program resulted from successful negotiations between the AB-CRC (Lisa Adams and Chris Baldock) and the United Nations Food and Agriculture Organization (FAO). It was part of a two-year, US$10.5 million project, *Restoration of Veterinary Services in Iraq*. This project was funded by the United Nations Development Group Iraq Trust Fund and implemented by FAO and the Ministry of Agriculture of Iraq.

As part of the formal training program, the group visited a wide range of relevant organisations, including:

- diagnostic veterinary laboratories
- livestock saleyards
- the Australian Government Department of Agriculture, Fisheries and Forestry
- the Australian Quarantine and Inspection Service (AQIS)
- Biosecurity Australia
- Animal Health Australia
- CSIRO Entomology
- the Australian Veterinary Association
- the University of Queensland's dairy farm and poultry research centre
- alpaca farms
- field stations
- regional veterinary offices
- private veterinary practices.

Much to the delight of the group members, they were able to visit the Iraqi Ambassador to Australia at the Iraqi Embassy in Canberra.

The AB-CRC looks forward to ongoing contact with its Iraqi colleagues.

AB-CRC annual workshop

The AB-CRC held its second annual national workshop in Perth on 7–9 November 2005.

The main body of the program consisted of research updates and poster presentations from the many research projects, including postgraduate projects, funded by the AB-CRC. The program also included research symposia on topics relevant to each of the three research program streams of the centre. The topics discussed were:

- microarrays, for the *Technologies to Enhance Detection* program
- wildlife research priorities, for the *Ecology of Emerging Infectious Diseases* program
- the AB-CRC surveillance portfolio in the context of a national surveillance strategy, for the *Advanced Surveillance Systems* program.

The AB-CRC's Wildlife Steering Committee held a satellite meeting during the workshop. A report of the outcomes of both the committee meeting and the symposium on wildlife research priorities can be found on the AB-CRC website.[1]

Summer school

The inaugural AB-CRC Summer School brought together 62 trainees and 13 trainers for a residential short course at the Sydney Quarantine Station on 13–17 February 2006. This may have been the first time in Australia (and perhaps elsewhere) that professionals in animal health, public health, plant health and aquatic animal health from government, industry and academic sectors have undertaken joint training in biosecurity and emerging infectious diseases. The trainees came from every State and Territory in Australia, and from New Zealand, China and Fiji.

The summer school comprised two courses:

- Course One, 'Emerging infectious disease preparedness and response: cross disciplinary training in disease surveillance and the role of the laboratory in disease control', was piloted at

1. http://www1.abcrc.org.au/pages/resources.aspx?RESOURCEID=107

the summer school. Over two days, participants were instructed in either the basic principles and methods of disease surveillance or the application of laboratory science to disease surveillance and control. This learning was then applied to the theory and practice of emerging infectious disease preparedness and response during a two-day, scenario-based training exercise. Trainees worked through the scenario in multidisciplinary teams and were required to adopt roles outside their traditional area of expertise.

- Course Two, 'Evaluation of surveillance systems: the use of non-survey data sources to demonstrate freedom from disease', was aimed at professionals with epidemiological expertise who have an interest in methods for analysing negative results of surveillance processes. The methods can be used to analyse surveillance data for demonstrating freedom from disease, to compare the efficiencies of different surveillance processes in detecting disease, to design surveillance for disease control programs, and for economic assessment of surveillance activities. The course was based on methods originally developed in projects of the Danish International EpiLab in the Danish Institute for Food and Veterinary Research, and further developed through an AB-CRC collaborative research project. Early feedback indicates that the methods will be adopted in a variety of ways across Australia and internationally (the course was also delivered in Switzerland the week following the summer school). The AB-CRC will be taking a close interest in monitoring the adoption of the methods.

A particular challenge was to make the summer school as relevant as possible to a diverse training group. The trainers are dedicated to cross-sectoral cooperation and are to be commended for their commitment to the summer school. The enthusiasm of the trainers was picked up by the trainees, who had a high level of engagement throughout the week.

The collaboration involved trainers from eight AB-CRC partners:

- two universities (Aileen Plant and Angela Merianos from Curtin University; and John Edwards and Trevor Ellis from Murdoch University)
- CSIRO (Peter Daniels from the Australian Animal Health Laboratory)
- three State government agencies (Tony Martin from the Department of Agriculture, Western Australia; Hume Field from the Queensland Department of Primary Industries and Fisheries; and David Smith from PathWest)
- an Australian government agency (Ian Peebles from the Australian Department of Agriculture, Fisheries and Forestry)
- a company (Evan Sergeant, Nigel Perkins and Jenny Hutchison from AusVet Animal Health Services).

Contributed by: Corinna Lange, Communication Officer, AB-CRC

Staff changes at Animal Health Australia

After several years of a relatively stable personnel team at Animal Health Australia, a series of changes has taken place over recent months.

Mr Simon Winter is moving on to pursue other interests after six years with Animal Health Australia. During Simon's time at the organisation, he has managed and contributed to a number of programs. His work has included:

- establishment of the Animal Disease Surveillance Program
- refinement of the National Animal Health Information System (NAHIS) and the National Arbovirus Monitoring Program (NAMP)
- finalisation of the Tuberculosis Freedom Assurance Program (TFAP) and the development of TFAP2
- contribution to the ongoing success of the National TSE Surveillance Program and the establishment of the TSE Freedom Assurance Program (TSEFAP)
- implementation of the South Eastern Australia Bovine Johne's Disease (BJD) Survey
- participation in the development of the National Surveillance Strategy.

At various times, Simon has also contributed to a number of external programs and organisations, including SAFEMEAT executive, National Livestock Identification System, the Australian Wildlife Health Network and the Australian Biosecurity Cooperative Research Centre for Emerging Infectious Diseases.

Recently, Simon has managed the Communications and Information Management section of Animal Health Australia. This followed the resignation of Mr Jamie Penrose in late 2005, to pursue a similar job as Director Communications and Marketing with Engineers Australia. The position includes managing Animal Health Australia's stakeholder engagement processes, knowledge and information management, corporate communications, and program communications, including the Protect Australian Livestock Campaign (PALC).

Simon's contribution to the national animal health system is well recognised and we wish him all the best for the future in his chosen field of IT and a whole new world of acronyms. Simon's direct replacement is Mr Scott Porteous.

Animal Health Australia welcomes Dr Kevin de Witte, formerly Principal Veterinary Officer in the Northern Territory. Kevin spent the past 21 years in Katherine, mostly as Regional Veterinary Officer. In this position, he was responsible for all regional animal health matters, including the conduct of tuberculosis eradication, endemic disease management extension, and animal management training issues, such as the introduction of the Dropped Ovary Technique (Willis) for cattle spaying. Endemic disease interests in cattle were the toxicoses: botulism, black soil blindness and poisoning by lead, fluorine, and urea. In horses, the main issue was Kimberley walkabout disease (poisoning by pyrrolizidine alkaloids). As Principal Veterinary Officer for the past three years, he was responsible for TFAP2, animal welfare and emergency animal disease issues (which often meant a trip to Canberra). His new roles at Animal Health Australia include the management of NAHIS, NAMP and TFAP2, and participation in animal welfare and emergency animal disease projects. Will he survive winter (the weather that is!) after all those years at latitude 14°S?

Dr Rob Keogh, Director Programs, has also called it a day after four and a half years with Animal Health Australia. He has made a huge contribution to Animal Health Australia in terms of its 'big picture' strategic direction. He has contributed to the ongoing development of the Emergency Animal Disease Response Agreement, the National Animal Health Performance Standards, vaccine supply and funding arrangements for foot-and-mouth disease and anthrax, Animal Health Australia's participation in the Biosecurity CRC and biosecurity planning. He will be replaced by Dr Mike Bond, currently Manager Veterinary Services, on 1 May 2006. By the time of publication, further recruitment action might have taken place. For more details, check the Animal Health Australia website[1].

Contributed by: Kevin de Witte, Project Manager, Veterinary Services, Animal Health Australia

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

International emergency animal disease response training workshop

Fort Collins, USA, 29–30 March 2006

Emergency animal disease (EAD) response trainers from Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States of America met on 29 and 30 March in Fort Collins, Colorado. The workshop was hosted by the United States Department of Agriculture, and follows the signing of the Memorandum of Understanding to Form an International Animal Health Emergency Reserve (IAHER) in May 2004.

Australia was represented by two officers from the Australian Government Department of Agriculture, Fisheries and Forestry; a member of Animal Health Australia's training team; and a veterinary officer from the Victorian Department of Primary Industries.

The IAHER is a framework agreement between the six countries that they will, where possible, provide assistance to each other in response to an animal disease emergency when the resources of the country affected by the outbreak are not sufficient to meet the needs of the emergency. The idea for the workshop arose from the realisation that, when the IAHER Memorandum of Understanding is implemented, the country receiving assistance will need to be confident that donor personnel have been suitably trained. The IAHER is not limited to veterinary personnel; emergency managers and others with relevant expertise are also included.

Participants in the workshop shared information on country approaches to EAD response training and on resources used in EAD training. Participants looked

at further opportunities for reducing duplication, enhancing collaboration, sharing resources and encouraging a common approach to EAD management in the six countries. The workshop identified which personnel were most likely to be exchanged under the terms of the IAHER. During the workshop, a checklist was developed to assist both donor and recipient countries with personnel exchange.

Issues for further work include recognition of equivalence of response role holders from different countries and development of a glossary of terms. The personnel exchange checklist will be developed further to identify responsibilities of donor and recipient countries at each phase of the response: request for assistance, pre-departure, arrival, in-country, and repatriation. Bilateral 'competency mapping' activities will begin, with like countries comparing their EAD training competencies. Initially, Australia will compare with New Zealand, the United States with Canada, and the United Kingdom with Ireland.

The outcomes of the workshop and proposed forward workplan of the group of participants will be presented to the Animal Health Quadrilateral Group (Quads) meeting for endorsement in May 2006.

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

NAHIS evolves

Over the past year, the National Animal Health Information System (NAHIS) database has been successfully migrated to the Animal Health Australia website. Various improvements have been carried out to improve its functionality and robustness.

Readers will be familiar with the public face of NAHIS: the Animal Health Surveillance Quarterly (AHSQ), Animal Health in Australia annual report (AHIA) and the Animal Health Australia NAHIS website[1].

AHSQ and AHIA are not being considered for extensive change in the near future. The most obvious change has been on the web page, with the updating of the disease information fact sheets and adoption of the new Animal Health Australia corporate style. There are currently about 140 animal disease fact sheets, which have been extensively reformatted and updated. The disease list has been revised and reduced to reflect OIE (World Organisation for Animal Health, formerly Office International des Epizooties) notifiable diseases. New and revised fact sheets are always in production by a NAHIS working group; these are approved by an NAHIS Editorial Panel before listing.

What hasn't been so obvious has been the enormous amount of 'behind the scenes' work by the principal contractors — AusVet Animal Health Services Pty Ltd. A major accomplishment has been the creation of an SQL database, which allows far greater functionality. The subsequent migration of all the old Access data, with validation of each record, is about 70% complete at the time of writing.

Much of the NAHIS database program developments have been logical developments from the old database. They have led to easier and better data entry by NAHIS coordinators. Examples of these are user log and access reports, display lists of permissible codes, mandatory data entry fields and forced restriction on data entry (so that date entry format is correct, for example), confirmation before deletion, enhancement of data filtering for administration, and access level control. A further improvement for the 51 registered database users is a news and events web page that keeps them updated of new requirements at login.

Development of the database is ongoing. Priorities are considered by the Animal Health Australia NAHIS manager, the NAHIS Coordinating Committee or the Animal Health Australia Board, depending on the significance of the change. Currently a 'NAHIS Manual' is being documented that will explain how NAHIS and the NAHIS database work. It is expected that this publication will lead to further suggestions for improvements from contributors to, and users of, NAHIS. The system contains 57 231 reports, incorporating 225 804 results — that's why you need a database!

Contributed by: Kevin de Witte, Project Manager, Veterinary Services, Animal Health Australia

1. http://www.animalhealthaustralia.com.au/programs/adsp/nahis/nahis_home.cfm

Quadrilateral Group meeting

Santa Fe, USA, 27–30 March 2006

Members of the Animal Health Quadrilateral Group (the Quads) met in Santa Fe, New Mexico, during the week of 27–30 March 2006. The Quads comprises Australia, Canada, New Zealand and the United States. The Quads countries work cooperatively to share approaches to policy, practical and strategic issues, and to support each other, where possible, in the international arena.

Countries shared recent emergency management experiences. The United States spoke of what had been learnt from Hurricanes Katrina and Rita, and the development of a response and recovery plan for companion animals. New Zealand spoke about the May 2005 foot-and-mouth disease hoax and the importance of transparency and consistency in managing the situation. Australia gave a presentation on Exercise Eleusis '05, the avian influenza simulation that was conducted in late 2005. The Quads Emergency Management Working Group reported on their activities over the preceding year and proposed a work plan for the year ahead.

Countries provided updates on animal welfare activities. Australia described its recent work on the Australian Animal Welfare Strategy, the Model Codes of Practice, and Australian Export of Livestock Standards, as well as the international work to improve animal welfare in those countries receiving Australian livestock shipments.

Other issues discussed were approaches to investigation and management of emerging and reemerging diseases of domestic and wild animals, compartmentalisation and zoning, aquatic animal health and strategic foresight activities.

On 29 March 2006, a joint session was held between the Animal Health and the Food Safety Quads. This session focused on animal cloning, avian influenza and animal identification and traceability.

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

Reporting of disease in wildlife and companion animals

Incidents in companion animals and wildlife can create a range of problems, just as incidents in production animals do. These potential problems include:

- community concern
- zoonotic diseases
- spill-over into livestock
- changes to conditions for certification for exports
- inability to reliably meet international reporting obligations
- environmental impacts.

Traditionally, agriculture departments in Australia have focused on production animals. However, the borders between production animal, companion animal, wildlife and human health issues are becoming increasingly blurred as more diseases, such as avian influenza, Nipah virus and severe acute respiratory syndrome (SARS) emerge. This trend is also occurring internationally.

On 1 January 2005, new reporting obligations were introduced by the World Organisation for Animal Health (OIE, formerly the Office International des Epizooties). Australia is now obliged to provide urgent notification to the OIE Central Bureau within 24 hours of occurrence of an emerging disease that has significant morbidity or mortality, or zoonotic potential. This obligation is not limited to production animals.

Historically, reporting of disease in non-production species has been less established. In some circumstances (e.g. where disease occurs in wildlife), the State or Territory agriculture agency may not be the responsible entity, and other agencies may need to become involved in the response. However, where the disease is of potential national interest, Australia's Animal Health Committee (AHC) has agreed that investigation, diagnosis and reporting are needed, regardless of species or any decision on the response.

AHC has agreed that standard reporting procedures must be followed. The chief veterinary officer

(CVO) of the affected jurisdiction must be notified of any preliminary diagnosis of emergency or emerging disease. Veterinary laboratories are obliged under State legislation to perform this reporting. Other bodies, such as universities, research institutions, wildlife agencies, private practitioner and production facilities, are also obliged to report. The CVOs will consult with the Australian CVO, AHC and, where appropriate, the Consultative Committee on Emergency Animal Disease (CCEAD) to ensure that Australia is best placed to manage disease incidents and is meeting international and trade obligations.

As part of any preliminary investigation, before coming to a definitive diagnosis, CVOs, AHC and CCEAD can provide advice on the best course of action to follow under circumstances of imperfect knowledge and can assess the potential significance of a disease incident.

Emergency animal disease awareness activities are based upon slogans such as 'Think the worst first' and 'Have you seen anything unusual?' This same approach is required if risks from new disease occurrences in Australia are to be kept to a minimum. The benefits to Australia of prompt reporting of any suspicion of new or emerging diseases are enormous, in terms of enhanced livestock and human health, trade, Australia's integrity with trading partners, and environmental impact.

Contributed by: Lyndel Post, Animal Health Secretariat, Product Integrity and Animal and Plant Health, Australian Department of Agriculture, Fisheries and Forestry

Aquatic animal health

Meeting of the OIE Aquatic Animal Health Standards Commission

In March 2006, the Aquatic Animal Health Standards Commission of the OIE (World Organisation for Animal Health, formerly Office International des Epizooties) met at the OIE headquarters in Paris. The meeting was chaired by Dr Eva-Maria Bernoth of the OCVO (Office of the Chief Veterinary Officer, Australian Government). It focused on preparing text that the commission will propose for adoption by the OIE International Committee at the May 2006 General Session, and also reviewed draft text that requires member countries' comment by September 2006. These two activities are described in further detail below.

Aquatic Code text proposed for adoption in May 2006

The text proposed for adoption at the General Session consists of a revised list of diseases; eight revised mollusc disease chapters and seven revised fish disease chapters for the Aquatic Code; and modifications to definitions and to disease listing and notification criteria. At the May meeting, the commission will propose delisting two fish diseases (infectious pancreatic necrosis and bacterial kidney disease) and adding koi herpesvirus disease, all three diseases being exotic to Australia. For mollusc diseases, the commission will propose delisting infection with *Mikrocytos mackini* (exotic to Australia), retaining infection with *Perkinsus olseni* (endemic in parts of Australia), and adding abalone viral mortality (exotic to Australia) as an 'emerging disease'.

Aquatic Code draft text for member countries' comment by September 2006

The meeting also assessed and modified draft text prepared by various ad hoc groups. The draft text consists of further suggestions for modifications to the list of diseases; one revised and eight new crustacean disease chapters for the *Aquatic Code*; and new text on aquatic animal welfare.

In summary, the draft text recommended the addition of three crustacean diseases (white tail disease, infection with hepatopancreatic parvovirus and infection with Mourilyan virus — the first two are exotic to Australia) to the OIE list of aquatic animal diseases as 'emerging diseases'. The commission also supported the addition of two crustacean diseases: necrotising hepatopancreatitis and infectious myonecrosis (both exotic to Australia), which are currently listed as 'under study'. It reviewed draft text on the principles for the welfare of aquatic animals; guidelines for the slaughter of farmed fish for human consumption; guidelines for the humane killing of fish for disease control purposes; guidelines for transport by land; and guidelines for transport by sea. While the general principles apply to all aquatic animals, the specific guidelines currently cover only fish. Guidelines on crustacean welfare will be developed at a later date. All draft text developed by the ad hoc groups will be circulated to OIE member countries for comment by September 2006.

Contributed by: Sean Savage, Office of the Chief Veterinary Officer, Australian Department of Agriculture, Fisheries and Forestry

Australian Wildlife Health Network

The Australian Wildlife Health Network (AWHN) receives reports of wildlife incidents and definitive diagnoses of cause of death in wildlife in Australia. The network is interested in receiving such reports. For copies of the network newsletter or digests, contact Amy Jones at awhn@zoo.nsw.gov.au. All contributions are recorded in the AWHN database (the Wildlife Health Information System, WHIS[1]). Details about selected incidents are provided below.

During this quarter, the network prepared and submitted a report on the previous year's wildlife investigations to the Office of the Chief Veterinary Officer, Australian Department of Agriculture, Fisheries and Forestry (DAFF). This report will be used for Australia's annual reports to both the World Organisation for Animal Health (OIE) and the OIE Wildlife Working Group.

Appointments of primary network coordinators in each State and Territory were also finalised by State Chief Veterinary Officers. The coordinators keep the Chief Veterinary Officers informed of wildlife events and developments.

Version II of the AWHN database is currently under development and is due to go live next quarter. This version will address reporting and data export. It will:

- generate standard detailed reports (e.g. for the National Animal Health Information System)
- allow the user to build their own purpose built reports (e.g. for zoonoses)
- include a 'watch-list' facility
- include a data export function so that data can be exported to a simple Excel spreadsheet (for mapping and sums)
- include a facility to generate automatic email alerts
- enable the user to enter specific avian influenza subtype data and population numbers.

These changes are still linked to a level of confidentiality — that is, different users will get different reports based on their level of access.

DAFF has recently enhanced the surveillance of avian influenza in Australia's wild birds. In January 2006, it established the Avian Influenza Wild Bird Steering Group to facilitate collaboration between State and Territory programs. A part-time project officer was employed to assist the group. Since 2004, cloacal swabs and faecal samples have been collected from approximately 7000 wild birds. The majority of samples were collected from shorebirds, approximately a quarter from ducks and magpie geese (*Anseranas semipalmata*) and a smaller number from shearwaters and other species. Sampling has mainly occurred in Victoria, New South Wales and the northern parts of Western Australia, the Northern Territory and Queensland; samples have also been collected in Tasmania and South Australia. All samples have tested negative to the H5 and H7 subtypes of avian influenza virus. Of the samples tested, only 0.5% were positive to low pathogenic virus subtypes, comprising H3N2 and H4N2 from ducks in Victoria, H4N8 from red-necked stints (*Calidris ruficollis*) on the central coast of New South Wales, and H11N9 from sharp-tailed sandpipers (*C. acuminata*), also on the central coast of New South Wales. In addition, avian influenza virus has been excluded as a cause of the three major wild bird mortalities reported around Australia during the first four months of 2006. Major surveillance activities in wild birds are continuing.

Numerous wildlife events have been reported for the last quarter. Cases that have possible significance for human or animal health, biodiversity, trade or Australia's agro-economy are described below. (For information on other cases, contact the Network at awhn@zoo.nsw.gov.au or view the surveillance database, WHIS.)

Mortalities/ morbidities of unknown causes

Paralysis, paresis and mortality occurred in wild birds (multiple species, primarily magpies — *Gymnorhina tibicen*) in the Sydney basin, New South Wales. The cause is unknown. Since 12 February 2006, about 250 reports have been provided of bird deaths (numbers ranging from 1 to 15 in each report, mostly clusters of 2–6 birds) centred on the central coast of NSW and the Sydney basin. No obvious cohort or sex predilection has been detected. About 70% of the birds are magpies and 15% are currawongs (*Strepera versicolor*). Many birds are found dead and others are either unable to fly or unable to stand. The following characteristic sequence is often observed: unable to fly, unable to stand, unable to hold their head up, acute respiratory problems, death. Birds generally die within about 6–8 hours of presentation, although there are reports of some birds surviving for up to 10 days. Histology

1. http://www.wildlifehealth.org.au

includes vasculopathy with nonsuppurative myocarditis/myositis, and localised encephalitis or myelitis. Avian influenza, West Nile virus, Kunjin, Newcastle disease, Murray Valley encephalitis, Japanese encephalitis, enteroviruses, intoxication and common avian diseases have been ruled out. Differential diagnoses currently include other flaviviruses, and further diagnostic work is continuing. The mortality rate has now decreased significantly.

Exclusion of suspected exotic and OIE list diseases

Avian influenza and West Nile virus were excluded as the cause of death in a small number of multiple avian species (mostly Australian ravens — *Corvus coronoides*) found dead at a beachside suburb in Perth, Western Australia, in February 2006. Intoxication is suspected.

Human health

Three reports were provided of mortalities due to chlamydiophilosis in mixed, wild psittacine (parrot) species from Western Australia during the last two weeks of January 2006. Chlamydiophilosis is also known as chlamydiosis, ornithosis or psittacosis.

Biodiversity/other

Deaths in a small number of neonatal orange-bellied parrots (*Neophema chrysogaster*, one of the world's most endangered species) from a captive breeding colony in Tasmania are currently under investigation. Preliminary results suggest a herpes virus, and the investigation is continuing.

Contributed by: Chris Bunn, Office of the Chief Veterinary Officer, DAFF, and Rupert Woods, Coordinator AWHN. The network would like to thank all those who submitted information for this report.

State and Territory reports

New South Wales

Contributed by: Barbara Moloney, NSW Department of Primary Industries

Anthrax

Two anthrax incidents were confirmed during the quarter. Both occurred on properties in the Narrandera district. The first, which occurred in early January 2006, involved the death of four out of 60 beef cattle. The animals had been grazing an oat crop that was too sparse to harvest. The second, unrelated incident involved a group of animals that were moved between two properties. A total of nine out of about 90 beef cattle and one of nine goats died.

Both incidents were managed in accordance with New South Wales Department of Primary Industries (DPI) anthrax policy. The properties were placed in quarantine, carcases were burnt on site and all at-risk stock were vaccinated. No stock movements from affected properties had occurred, other than the movement of animals between the two properties involved in the second incident.

During the quarter, anthrax was excluded as the cause of death on six occasions, three involving sheep and three involving cattle. The exclusion investigations involving sheep included one property where anthrax had been diagnosed in the distant past and another where sheep had moved from an anthrax-affected property at Condobolin (reported in AHSQ Vol. 10 No. 4). The exclusion investigations involving deaths in cattle included the death of an animal vaccinated following an anthrax incident in the Murray district in December 2005 (AHSQ Vol. 10 No. 4).

Paralysis ticks in young calves

There were increased reports during January 2006 of losses from paralysis ticks *(Ixodes holocyclus*) in a number of areas in the north-east of New South Wales. A quick survey of producers suggested deaths on some properties of around 20% attributed to paralysis ticks in young calves early in the season.

These losses are suspected to be associated with the fact that some country is no longer burnt and the dry conditions have ended. The return of normal high numbers of paralysis ticks in these areas coincided with calving, and susceptible young cattle in these areas have no previous exposure to ticks. As well, Bayticol Pouron® has been deregistered, and some producers have not adapted to using the remaining registered products.

Malignant catarrhal fever in cattle

In January 2006, a 5-month-old Hereford steer from a property in the Cooma district was presented to a local veterinarian. Sheep and cattle are run in conjunction on the property. The steer was severely depressed, had a fever of 41.2°C, and had ulceration of the nasal plane, the dental pad, the cheeks and the tongue. There was some corneal oedema, and the conjunctivae were red and inflamed. There was some inflammation at the coronet.

The steer failed to respond to treatment, and a post mortem examination was conducted within 36 hours of initial presentation. By this stage, ocular signs had progressed and there had been sloughing of the epithelial layer of the tongue and upper palate. Generally, the skin felt thickened and nodular. There was inflammation of the trachea, lungs and intestines. Histopathology confirmed multiorgan vasculitis and vascular degeneration, strongly suggestive of malignant catarrhal fever (MCF). Testing at the Australian Animal Health Laboratory confirmed MCF by polymerase chain reaction and TaqMan assay. Foot-and-mouth disease virus and rinderpest were excluded.

Deaths in magpies and other wild bird species

Widespread deaths have been reported in magpies (*Gymnorhina tibicen*) and some other species (currawongs — *Strepera* sp., magpie-larks — *Grallina cyanoleuca*, koels — *Eudynamys scolopacea*, etc) in the Central Coast and Sydney areas. More than 80 reports of deaths have been provided, and each report has involved a number of birds.

The major sign in the birds is weakness, followed by death. A number of organisations, including NSW DPI; NSW Department of Environment and Conservation; NSW Wildlife Information and Rescue Service; Australian Registry of Wildlife Health; Australian Department of Agriculture, Fisheries and Forestry; and Taronga Park Zoo, are working to solve the problem.

Samples of affected birds have been tested at Elizabeth MacArthur Agricultural Institute (EMAI) and other laboratories. These tests have indicated that avian influenza, Newcastle disease and West Nile virus are not involved. Testing for toxins has also been negative. The condition may be due to an arbovirus, and more work is needed.

Avian influenza exclusions in wild birds

NSW DPI is working in collaboration with the NSW Game Council to investigate the role of wild birds in the epidemiology of avian influenza. Funding for this project has been provided by the Wildlife and Exotic Disease Preparedness Program. Surveillance on wild birds in New South Wales specifically aims to assess:

- the role of wild birds in introducing foreign subtypes
- the risks of low pathogenic virus becoming highly pathogenic through contact with poultry.

A geographic information system using Birds Australia data, wetlands information and poultry locations has identified priority wetlands for surveillance to address these key aims. Consideration has been given to targeting the species most likely to be involved, suitable locations and timing, and adequate sample sizes to estimate virus prevalence.

Since October 2005, 702 cloacal samples have been collected in six locations in New South Wales. Species sampled include grey teal (*Anas gracilis*, 260), Pacific black duck (*A. superciliosa*, 230), wood duck (*Chenonetta jubata*, 180) and other anatids. Three hundred of these samples have so far been examined at EMAI using FluDetect and PCR tests — all of these were negative for avian influenza.

Zinc toxicity in dairy cattle

A Holstein Friesian dairy herd in the Moss Vale district was inadvertently supplemented with 10 times the recommended level of zinc (3 times the toxic threshold). The zinc supplement was added to the diet as a preventative treatment for facial eczema. Cows exhibiting previous episodes of photosensitisation were present in the herd. In approximately 40% of the 200+ cow herd, milk production either decreased or ceased, resulting in these cows being dried off. A proportion of the affected cows exhibited weakness, projectile diarrhoea, red water, anaemia and rapid weight loss. Several cows have aborted. Four cows have died and other deaths are expected.

Severe kidney pathology (nephrosis) and jaundice was noted on post mortem examination.

Inspection of the severely affected survivors showed emaciation; thick manure contamination of the back legs and tail with intermittent projective diarrhoea; very pale nasal mucous membranes, coronary band and teat skin; and loss of pigment (reddening) from black hair over most of the body, especially around

the eyes ('spectacles' — typically associated with copper deficiency).

Clinical pathology on five severely affected survivors showed elevated blood zinc levels (up to 4 times the high range of normal) 3 weeks after the zinc supplement had been removed. Packed cell volumes ranged from 20% to 28%. Compared with testing performed 19 days earlier, liver enzymes were now elevated in three of the five cows, calcium levels had increased compared with phosphorus and were now normal (previous Ca:P < 1 and calcium concentrations < 2mmol/L) and kidney enzymes were normal (previously elevated).

Very few references are available on zinc toxicity in cattle, especially on the scale observed in this herd. Zinc excess interferes with the transport of copper, calcium and iron from the gut, and zinc deposition in organs results in impaired function. Elevated blood zinc levels have been reported for 6 weeks or more after removal of toxic levels. Haemolytic anaemia, scouring, abortion and depression have been described previously. Observations on this herd are continuing, especially on cow survival, reproductive performance and milk production in affected cows that were not dried off.

Northern Territory

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

Heat stress during muster

During February 2006, a heifer in the Darwin region died suddenly after being mustered and yarded. Convulsions and bellowing were observed before death. At autopsy, the animal appeared dehydrated, with findings of sunken eyes, minimal body fluids, dry rumen contents and pale pink muscle tissue. Biochemistry results revealed elevated levels of muscle enzymes and various serum electrolytes. These included higher levels of chloride, sodium and albumin, supporting a diagnosis of systemic dehydration, and elevated potassium levels, which can lead to heart failure. Histopathology of the kidneys revealed acute tubular necrosis, which can potentially be caused by excess phosphorus. The lungs were congested, with widespread oedema and focal haemorrhages. The owner reported that a salt lick with added phosphorus had been made available to the stock the day before. In view of the sudden onset and circumstances, it was surmised that death was due to heat stress, although access to the salt lick could have been a contributing factor.

Hepatic encephalopathy in a buffalo

A buffalo on a research farm in the Top End developed nervous signs, including head pressing, ataxia and difficulty in standing. The animal was euthanised. A post mortem examination revealed congestion of all organs; copious, blood-tinged peritoneal fluid; and a marked discoloration of the liver. Serum chemistry results confirmed elevated levels of liver enzymes, urea and creatinine. Histopathology of the liver revealed severe subacute periacinar necrosis. The diffuse acinar ('nutmeg') pattern in the liver with blood pooling is consistent with chronic passive congestion, which is typically due to obstruction of the large hepatic vein or posterior vena cava. There was no indication of heart failure. The marked ascites is due to an inability of blood returning from the abdomen to flow easily through the liver due to scarring and venous obstruction. Neurological signs can result from an inability of the failing liver to convert ammonia to urea; this leads to a build up of blood ammonia, which has a toxic effect on the nervous system. The resulting hepatic encephalopathy in this case was thought to be from a lesion causing mechanical obstruction to blood flow from the liver.

Suspected poisoning in poultry

The poultry in a small backyard flock of four died within a half-hour of each another in the Katherine rural area. Various agricultural chemicals, including chlorpyriphos, were seen close to where the chickens died, but no obvious leaks or spills were noticed. No significant gross findings were seen on post mortem examination, except for pulmonary congestion and oedema in one hen. Samples were sent to the Australian Animal Health Laboratory for category 2 avian influenza exclusion. Preliminary tests, including a new polymerase chain reaction test, were negative. There were no significant findings on histopathological examination of organs. The lack of lesions and sudden deaths support the submitting veterinarian's suspicion of acute pesticide poisoning.

Queensland

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

Bovine

Ephemeral fever

Bovine ephemeral fever (BEF) was diagnosed on two properties in the Waggamba shire by polymerase chain reaction testing. One property had six sick recently introduced heifers, aged 14 months, out of a group of 100. The heifers had fever, shifting lameness, depression and dehydration. The other property had a bull aged 5 years with a fever, respiratory signs and later recumbency. The bull had been vaccinated against BEF in October 2005.

Salmonellosis

On a Clifton shire property, five dairy cows were sick and two died. The cows, which were 6 years old, had reduced milk production and were anorexic and diarrhoeic over 2–3 days. These signs were attributed to the feeding of new silage. Histologically, an autopsied cow had mild subacute enteritis and a subacute lymphadenitis of the small intestinal lymph nodes. *Salmonella* sp. was isolated from the small intestine.

Salmonella group E was diagnosed in Beaudesert shire in early February 2006 in a group of 15 dairy cows out of 160 at risk. Mastitis and diarrhoea were reported in some of the cattle before death.

Salmonella group D was found to be responsible for three sick and 20 dead 3-week-old dairy calves out of a group of 60 on a property in Widgee shire in late February 2006. Clinical signs of dehydration and sudden death were observed.

Suspected botulism

Botulism was suspected on clinical signs to have caused 25 cattle deaths, and one sick animal, in a 300-head dairy herd in the Beaudesert shire in late February 2006. Before feeding, a dead bird was removed from the cattle feed, a mixture of bread dough and other ingredients. Recumbency was observed in cattle before death. An acute purulent bronchopneumonia was detected in one autopsied cow, but botulism toxin could not be detected in cattle that were tested.

Lead poisoning

Five dead and four sick 12-week-old beef calves were reported in a group of 80 introduced calves on a Bungil shire property. They exhibited head pressing, ataxia and sudden death. One calf had a blood lead level of 0.70 mg/L and a liver lead level of 9.7 mg/kg fresh weight. No changes were detected on microscopic examination of the brain.

A 6–8-month-old Brahman heifer in the Jericho shire was presented as being depressed. On examination, she was found to be docile and lethargic and showed little reaction to being approached or handled. Haematology was normal, but a biochemical profile revealed azotemia and an elevated blood lead level (0.4 mg/L).

Arsenic poisoning

Twenty-six cattle from a herd of 84 in the Calliope shire were found dead, and a further 20 were sick, presenting with an uncoordinated gait, rough coat, and scouring. Samples from two animals were submitted to the laboratory. Histological examination of the heart and lungs of both animals was unremarkable apart from mild pulmonary oedema. Arsenic levels in the fresh kidney of each animal (10.6 mg/kg and 11.4 mg/kg) were consistent with poisoning.

Lantana poisoning

Plant poisoning due to lantana was suspected of causing sickness in two yearlings out of eight introduced cattle in south-east Queensland in early January 2006. Clinical signs of fever, weakness, yellow mucous membranes and loss of condition over several days were observed. The animals had elevated bilirubin, suggestive of lantana poisoning.

In the Johnston shire, three of 100 two-year-old steers died with photosensitisation and jaundice. Hepatopathy was diagnosed in one animal sampled. Lantana poisoning was suspected.

There was an increased incidence of reports of lantana toxicity in cattle located in coastal central Queensland during February and March 2006. Increased numbers of reports were possibly due to owners not being familiar with the clinical signs of lantana toxicity (and consequently misdiagnosing other illnesses as lantana toxicity), and seasonal influences (dry weather, which limited pasture growth) increasing lantana toxicity. Another factor is that introduced cattle that are naive in their choice of diet browsed lantana as a source of green feed in the dry summer experienced in the region. Locally bred

cattle do not generally consume the local toxic plants such as lantana.

One herd in the Mackay shire had 11 cattle die out of 400 at risk. Cattle that were born in a lantana-free area had been introduced to the area 9 months earlier. Another central Queensland herd had three clinically sick animals out of 50. The three sick animals had not been exposed to lantana before they were introduced to the coastal area.

Babesiosis

A property on the Atherton Tablelands lost eight of 35 beef cows over a period of 5 weeks from *Babesia bovis* infection. The unvaccinated cattle were introduced to the property from the cattle-tick infected zone of the Croydon shire, 3 months after being on another Tablelands property. The first death occurred 6 weeks after introduction to the second farm.

Another farm on the Tablelands with a herd of introduced cows had two deaths due to *Babesia bovis*, with five cattle requiring treatment. The sick cattle showed signs of fever, anaemia and jaundice.

Seventeen cases of *Babesia bovis* infection and one case of *Babesia bigemina* infection were diagnosed at outbreaks on properties in the cattle-tick endemic area of south-east Queensland.

Sheep

Salmonellosis

Twenty-one 5-month-old lambs from a flock of 470 merino-Dorset cross sheep died on an Inglewood shire property. An estimated 40% of the remaining flock were sick, with some exhibiting bloody scours, followed by death in severe cases. *Salmonella* sp. was isolated from the bile of one autopsied animal.

Pink eye (keratoconjunctivitis)

A Winton shire property with a bush fly problem noticed an incidence of high mortality in lambs and found that approximately 10% of the ewes appeared blind. Affected sheep had hyperaemic conjunctivae and opaque corneas, with no ocular discharge. The ewes had difficulty seeing obstacles and finding feed and water. Blood samples from six animals showed some degree of dehydration, and an autopsy showed no gross pathology. A diagnosis of keratoconjunctivitis was made. Many of the animals showed signs of recovery within a week.

Pigs

Swine dysentery

Thirty 8-week old piglets out of 300 on a Waggamba shire piggery were sick with diarrhoea, weight loss, pleurisy and lameness. *Brachyspira hyodysenteriae* was isolated from faecal samples.

The cause of death and sickness of 9-week-old pigs on a piggery in the Beaudesert shire in mid-February 2006 was swine dysentery (*Brachyspira* sp.*)* and an associated bronchopneumonia. Of 100 pigs at risk, 20 died and 20 were sick. Rapid loss of body condition and subsequent death were observed in affected animals. Gross autopsy revealed typhlitis and colitis, and silver stains of colon and caecum sections revealed the presence of many spirochaete organisms.

Goats

Enterotoxaemia

There were 14 dead and 20 sick meat goats out of a herd of 250 on a Warwick shire property. Affected goats were 12 months of age and had not been vaccinated for enterotoxaemia. Goats were depressed and scouring for 10–12 days. *Clostridium perfringens* was isolated from the small intestines of an autopsied goat, and an antigen enzyme-linked immunosorbent assay (ELISA) was positive for *C. perfringens* epsilon toxin.

Poultry

Avian encephalomyelitis

Avian encephalomyelitis was suspected as the cause of the death of 285 broilers, aged 14 days, out of 24 000 at risk on a farm in south-east Queensland in early February 2006. Clinical signs of incoordination and head shaking were observed. Although the avian encephalomyelitis virus was not detected, histological findings, including moderate to severe lymphocytic pancreatitis, were consistent with the diagnosis. Vitamin A and E deficiencies were also detected. Avian influenza and Newcastle disease were excluded.

Wild birds

Avian influenza ruled out in wild bird mortalities

Three sick and two dead wild ducks were observed on a Banana shire property that was host to large numbers of wild ducks. Two of the sick birds were unable to fly, and the third — which died later that day — showed leg paralysis and dyspnoea. A

botulism ELISA was negative, and histological examination was unremarkable. Samples sent to the Australian Animal Health Laboratory (AAHL) for avian influenza exclusion were negative.

An ibis-like bird was found dead in a farm dam in the Warwick area. Three days later, a duckling that had been on the dam for a number of weeks was also found dead. Avian influenza testing at AAHL was negative.

South Australia

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

Suspected lomandra toxicity

A small herd of Murray Grey cattle belonging to a producer in the Adelaide Hills had been resident in one paddock for 3 years. The paddock was predominantly unimproved pasture. During spring of 2005, three of the cattle became affected by a staggers syndrome, and two of these animals died shortly after (within weeks of onset). The third animal, aged 4 years, remained alive and with mild staggers for the next 3 months. There was a gradual increase in the severity of the signs and then sudden onset deterioration. Over a 2-day period, the steer became extremely aggressive and the staggering more pronounced. When driven, it would collapse and have difficulty rising. The animal was in good body condition, bright and alert, and the front legs appeared unaffected. The animal was euthanised and a post mortem examination was performed. No gross abnormalities were found, but histopathology revealed severe spongiform vacuolation and demyelination of white matter tracts of the spinal cord, and mild spongiform change in the white matter tract of the brain. Periportal biliary hyperplasia was found in the liver. The animal tested negative for bovine spongiform encephalopathy. The histopathology was suggestive of a toxic principle associated with the *Cycas* and *Macrozamia* genera. These plants are not very commonly found in paddocks in this part of South Australia and were not present on the affected property. *Lomandra* spp. (spiny headed mat rush) was present in large amounts in the paddock and has been anecdotally implicated in a similar syndrome. In the absence of any other obvious cause, lomandra toxicity was considered to be the most likely diagnosis.

Plant poisonings in the mid-north

Twelve ewes in the mid-north were found to have died suddenly of *Tribulus terrestris* (caltrop) poisoning. The liver histopathology indicated a diffuse periportal bridging biliary hyperplasia, accompanied by intrabiliary crystals and a moderate hepatopathy. Although the ewes were pregnant, pregnancy toxaemia was not observed.

In a mid-north district, 300 lambs were affected to varying degrees with ill-thrift without scouring. Autopsy of one of the lambs revealed a noticeably shrunken and fibrous liver, and histopathology confirmed a severe biliary hyperplasia with moderate megalocytosis. These lesions are considered to be suggestive of pyrrolizidine alkaloidosis; in this district, this is usually due to *Heliotropium* spp. (potato weed) or *Echium* spp. (Salvation Jane). Pyrrolizidine alkaloidosis was an interesting diagnosis as this is more commonly seen in older sheep. Chronic mycotoxin exposure was a possibility, but there was no history consistent with it.

Caltrop poisoning was also reported on the Yorke Peninsula when a mob of 200 wethers was moved onto pea stubble containing the weed. Five wethers died and 12 were clinically affected. They had previously grazed cereal stubble, where they also had access to caltrop. It is thought that the switch to the higher protein peas, in conjunction with a spell of unusually hot weather that stressed the caltrop, was important in the development of toxicity. Liver histopathology was similar to that described above. The kidneys also showed interesting changes, including dilated tubules and ducts containing flocculated proteinaceous fluid, tubular epithelial cytoplasm containing bile pigment, and cortical granulomas containing acicular clefts.

Sheep on the Yorke Peninsula experienced further deaths associated with plant toxins. Three of a flock of 140 pregnant ewes died after a short period of tachypnoea, diarrhoea and lateral recumbency. Metabolic diseases (hypocalcaemia or pregnancy toxaemia) were initially suspected, but histopathology of the brain revealed neurons containing dark brown, coarsely granular cytoplasmic pigment in the medulla, cerebral cortex and hippocampus. Perineuronal and perivascular oedema was also noted in the cerebral cortex. This was considered to be strongly suggestive of *Phalaris aquatica* toxicity (phalaris staggers).

Lupinosis on the Eyre Peninsula

Several producers on the Eyre Peninsula have had stock affected with lupinosis. Most affected producers have reported 15–30 deaths and up to several hundred animals clinically affected. This has been the highest number of cases reported since the introduction of *Phomopsis*-resistant varieties of lupin fifteen years ago. Both sheep and cattle have been described with sunburn, jaundice and ill-thrift. An unusually wet spring, followed by occasional summer rains, is thought to be a precipitating factor.

Flood plain staggers in sheep

A property in the south-east undertook a pasture renovation program on a 12-acre area of a swampy paddock with a high peat content. The program did not succeed, and the paddock became covered with annual beard grass (*Polypogon monspeliensis*) and patches of a fleshy-stem, prostrate plant, *Salicornia quinqueflora* (beaded glasswort). A flock of approximately 500 Finn/merino ewes was introduced to this paddock. Deaths were observed 6 days later; 44 animals died and 60 animals aborted. Clinical signs observed included listlessness in the whole flock, with affected sheep being found in lateral recumbency and opisthotonus. Onset of death and decomposition was rapid.

Examination of the paddock revealed a significant number of distorted annual beard grass seed-heads. Samples of the seed-heads were found to contain the potent tunicaminyluracil toxin that would be lethal to livestock ingesting it. This condition is known as flood plain staggers or Stewart's range syndrome.

No further deaths occurred after the flock was removed from this paddock. Because the paddock has a high peat content, it cannot be burnt. A careful grazing strategy of the area will be required in the future, probably including grazing before the seed-heads emerge. Another paddock pasture renovation program will be necessary in the future.

Erysipelas in turkeys

Deaths in a 12-week-old male turkey flock of 2400 birds were investigated. Over 2 days, mortality had increased from 2 to 40 birds per day. The males had been reared with a similar number of females in a neighbouring shed, and then moved to the current shed a few weeks previously. No mortalities were observed in the shed containing the females. *Erysipelas rhusiopathiae* was cultured from peritoneal swabs and the liver of the dead birds. Avian influenza was excluded on clinical signs and pathology.

Further enquiry established that the affected flock was the first placed in this shed by the current owner. The property had previously been a broiler farm, and had changed hands about a year before. Original turkey placements were small enough for both male and female flocks to be grown out to processing in one shed, but bird placement numbers had increased, forcing the males and females to be split between sheds. The second shed had been used to house sheep immediately before placement of the birds. It was postulated that the sheep had contaminated the dirt floor, and that the birds had picked up the bacterium after scratching through the litter down to the soil.

About a week later, another turkey producer reported a rapid increase in bird mortality. Autopsy suggested another case of erysipelas, which was confirmed on culture. Investigation revealed that a bird-catching crew had taken birds from the originally affected farm (before it had been investigated) and had then proceeded to the second affected farm to catch birds from the newly affected shed. This demonstrates the importance of fomite spread of disease and of adequate transport and farm biosecurity.

Tasmania

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

Laboratory accessions

Source	Number of accessions
Aquaculture	77
Companion	120
Livestock	407
Other	8
Wildlife	199

Notifiable diseases

	Investigations	
Diseases	Positive	Total
Contagious agalactia	0	1
American foul brood	4	5
Anthrax	0	3
Avian influenza (HPAI)	0	6
Avian psittacosis	0	4
Brucella ovis	0	5
Brucella abortus	0	2
Chalkbrood	0	4
Enzootic bovine leucosis	0	1
European foul brood	0	4
Hydatid disease	1	8
Johne's disease	8	22
Leptospira hardjo	3	15
Leptospira pomona	1	15
Listeria	0	8
Macrocyclic lactone resistance	0	5
Marine aeromonad disease	1	3
Negative finfish bacteriology*	0	42
Newcastle disease (virulent)	0	6
Q fever	0	1
Clinical salmonellosis	7	60
Perkinsosis of shellfish	0	1
Piscirickettiosis	0	8
Post-weaning multisystemic wasting syndrome	0	1
Pullorum disease (*Salmonella pullorum*)	0	10
Rickettsia-like organism of salmonids	0	8
Salmonella abortus ovis	0	13
Salmonella enteritidis	0	11
Transmissible spongiform encephalopathy	0	5
Viral encephalopathy and retinopathy	0	1

* *Aeromonas salmonicida* ssp. *salmonicida*, goldfish ulcer disease, streptococcosis of salmonids

Severe liver disease in dairy cows

In mid-March 2006, severe photosensitisation and an associated drop in milk yield were investigated as a suspect case of acute bovine liver disease in 60 cows of a herd of 290 Friesians. The herd was located in the north-east of the State. The single mortality was autopsied. On pathology, the animal appeared to have been suffering from infectious necrotic hepatitis as well as obstructive fibrinoid necrosis of the gall bladder, and was thus of little value in identifying the herd problem. Of ten affected cows and eight unaffected cows sampled from the herd, gamma glutamyltransferase (GGT) was elevated in all but three (unaffected) animals. *Pithomyces chartarum* spore counts on pastures recently grazed by the herd were extremely high (155 000 spores per gram of leaf), suggesting that facial eczema might be the primary cause. This disease is rarely reported in Tasmania. The pastures had been cut for silage and were in good condition, apart from a build-up of litter, which probably contributed to the spore counts. While no further mortalities have occurred, feed intake and milk production have remained low. High *P. chartarum* counts have since been found on three other properties in the vicinity of the first case, associated with photosensitivity, elevated GGT and a sudden decline in milk yields in cattle. There have been no reports of affected sheep in the same areas.

Suspect sporadic porcine encephalomyelitis in weaner pigs

Sporadic porcine encephalitis (Talfan disease) was suspected in a piggery in northern Tasmania during the first quarter of 2006. Of a group of 200 weaners, eight were affected during this time. They experienced a sudden onset of ataxia, progressing to tonic convulsions or uncontrollable trembling over 3–4 days, at which point they were euthanised. A sow (dam to six of the affected pigs) was culled after showing abnormal behaviour (persistent head shaking and walking backwards). Subacute mononuclear meningoencephalitis, which is highly suggestive of a viral aetiology, was diagnosed on histopathology of tissues from the weaners. However, no viral pathogens were produced from general mammalian virus isolation. Hypoglobulinaemia was also found in the weaners, indicating failure of maternal antibody transfer. Talfan disease (caused by an enterovirus) has been reported previously in Tasmania and is considered endemic on most pig farms. It is rarely reported because it is only seen when there is a failure in the transfer of passive immunity to neonatal piglets.

Suspect mycotoxicosis in turkeys

A turkey-raising property experienced losses in two groups of growers in January. High mortality (500 of 600 birds) and high morbidity (entire shed of 1000 birds showing lethargy and anorexia) occurred over a 48-hour period. Avian influenza and Newcastle disease were ruled out. Segmental skeletal muscle necrosis and pneumonitis were found on histopathology. Poor quality feed was found in an old silo that was used for both affected groups.

Victoria

Contributed by: Tristan Jubb, Department of Primary Industries, Victoria

Pseudomonas mastitis in dairy cows

In January 2006, 14 dairy cows on a property near Camperdown in south-west Victoria died from acute mastitis caused by *Pseudomonas aeruginosa*. Deaths occurred within 3–5 days of the last milking in three separate groups of cattle treated with two different 'dry cow' antibiotic preparations. *Pseudomonas* was cultured from the milk of all dead animals and a small number of the tubes of one of the dry cow preparations. Various water samples, teat wipes and teat washes were culture negative, and milk samples from cohort cows with high cell counts were also negative. The source of the infection is yet to be determined and the investigation is continuing. The cost of this outbreak has exceeded $30 000.

Lameness in cattle

During January 2006, severe lameness leading to septicaemia and myositis was determined to be the cause of death of five heavily pregnant cows on two properties in north-east Victoria. The cows had been purchased from a saleyard in December 2005. Two lines of cattle, 46 head in total, originated from the same property. The cattle were lame and exhibited aggressive behaviour. They had a tendency to wallow in the dam or lie in the sun, despite the hot weather conditions. Inspection of the lame cattle and post mortem examination consistently found under-running of the soles of the lateral claws of the hind limbs and, in some cases, separation of the claw at the coronary band. Infection had tracked up the limb to form abscesses within the muscles of the thigh and back, in one instance causing a severe peritonitis. Laboratory investigation confirmed cellulitis, bacterial myositis and terminal bacteraemia as the cause of death. It has been reported that cattle with nervous temperaments that are held on concrete yards for more than 24 hours are predisposed to a lameness syndrome; this starts as a traumatic laminitis and leads to either chronic lameness or septicaemia and death. The cattle in this incident had been pregnancy tested at the saleyards, and their difficult behaviour during this procedure might have exacerbated the clinical signs. The cost of this outbreak to one of the producers was estimated to be $5000.

Fibrinous bronchopneumonia in weaner lambs

In February 2006, ten weaner lambs in a mob of 1000 died from chronic fibrinous bronchopneumonia on a property in the Coleraine district of south-west Victoria. The weaners were grazing dry pasture and dryland lucerne, supplemented with lucerne hay and oats. Autopsy showed that the affected lambs had extensive fibrinous pleural adhesions, some large encapsulated abscesses, and smaller multifocal abscessation in consolidated lung tissue. *Pasteurella multocida* was cultured. The weaners had been drenched 6 weeks earlier by being held in catching pens and sitting on their breech with their head held. The bronchopneumonia was consistent with drench inhalation. The producer has similar problems each summer in their weaners. This disease incident has cost the producer more than $1000.

Ear mites in a Saanen goat herd

Early in February 2006, on a Saanen goat dairy farm in the Mansfield district of north-east Victoria, 60 out of 73 (82%) weaner goats developed aural haematomas secondary to ear mite infestation. The haematomas occurred after a period of intense head shaking, scratching and rubbing at ears. The rapid spread of the causal ear mite, *Psoroptes cuniculi*, identified by microscopic examination of ear swabs, was probably enhanced by the intensive rearing practices on this farm. Treatment with oral moxidectin did not eradicate the mite. Although the goats have now recovered from the acute phase of the infestation, an inability to export the young goats to China because of permanent deformities of the ears has resulted in significant economic loss to the producer. Treatment of the ear mite infestation was complicated by the fact that a limited number of products is registered for use in goats.

Enzootic ataxia in adult deer

Enzootic ataxia (copper deficiency) contributed to the death of ten adult eastern red deer (*Cervus elaphus*) and Hungarian elk in a herd of 600 deer on a farm in the Casterton district of south-west Victoria. Another six deer were clinically affected. Adult deer developed hindquarter ataxia and progressively wasted over a 6–12-month period before death or euthanasia. Fawns and weaner deer were not affected. Hungarian elk, a larger frame deer,

were the most severely affected. Blood tests on clinically affected deer and cohorts revealed low serum copper concentrations (<8 U/L). Soil copper levels were also low. Histopathology of the spinal cord, from an ataxic eastern red deer, showed myelin degeneration in the dorsolateral and ventral funiculi. Liver copper was 40 μmoles/kg wet wt (<60 is deficient). The farm had a similar incident in crossbred lambs several years earlier, which responded to copper supplementation. There have been no further cases in the sheep. The occurrence of copper deficiency in the deer has cost the producer more than $10 000, excluding subclinical production losses.

Sudden death in adult pigs caused by *Lawsonia intracellularis*

Six pregnant, mature, breeding sows died suddenly over a 36-hour period on an 800-sow piggery near Bendigo in north-west Victoria on a very hot weekend in January 2006. The sows were pale, and autopsies revealed the classical proliferative haemorrhagic ileitis of *Lawsonia intracellularis*.

The sows were home-bred, and had received continuous medication against *Lawsonia* infection since birth. This is in contrast to the normal practice of controlling *Lawsonia* by periodically and temporarily medicating feed, allowing subclinical infection to stimulate immunity by approximately 5 months of age. All had been in gestation stalls for 6–8 weeks and, notably, none were in adjoining stalls. Similarly aged and managed introduced breeders were unaffected.

This outbreak is unusual because *Lawsonia* usually causes disease in pigs less than 30 weeks of age, rather than in adults. Also, disease is usually expressed about 3 weeks after infection; these pigs had effectively been isolated in their gestation stalls for much longer.

It was speculated that the sows may have had a latent infection and low immunity because of continuous low-level medication. On this farm, breaks in feed medication, even for adults, never occurred, and no account was taken of reduced relative feed intake of breeders when calculating medication rates. Growing animals consume 3–5% of their body weight, whereas breeding animals are restricted to 1%; thus an effective prophylactic dose in weaners and growers becomes a marginal dose in adult breeders.

The stress of hot weather, with the ambient temperature reaching 41–42°C, combined with ineffective medication, may have precipitated clinical disease.

Miliary hepatitis in commercial laying hens

Six cases of miliary hepatitis syndrome in commercial laying hens have been recognised in Victoria this quarter. These cases involved egg layers and breeders, usually litter-floor reared and housed. In one case, the hens were housed in three-tier cages with overfull manure removal belts in close proximity. Outbreaks were typically indicated by an increase in mortality, with or without an associated drop in egg production. Post mortem examination revealed miliary lesions of pale, translucent or red spots scattered throughout the liver. The characteristic finding by the laboratory was that no significant bacteria could be cultured by conventional means, ruling out organisms such as pasteurellae and salmonellae. Histopathology also revealed acute focal coagulative necrosis of hepatocytes without any organisms observed. Treatment with antibiotics resulted in a decrease in the mortality rate and recovery of egg production. Subsequent relapses did occur on occasions.

Miliary hepatitis is an ephemeral and sporadic cause of death in laying chickens. The disease is characterised by a short period of illness and rapid death in laying birds. It is usually associated with rearing and housing of the birds on the floor, but has been known to occur in cage-housed birds. There is an apparent seasonality; the problem occurs mainly in the warmer months in a number of States, including Victoria, New South Wales and Queensland. The losses from mortality can be up to 10% over a few weeks. The disease responds to treatment with antibiotics, indicating a possible bacterial cause. Small white or yellow spots in the livers are consistently found during autopsies, but bacteria are not observed or able to be cultured by conventional diagnostic means. Histopathology shows focal hepatocellular necrosis with a minimal infiltration of granulocytes. Special staining techniques for detection of microorganisms consistently fail to reveal an infectious agent.

Mass bird fatalities at a sewage treatment plant

An estimated 700 ducks died during the spring of 2005 at a sewage treatment plant in south-west Victoria. The mortalities were mainly confined to two species of duck — the pink-eared duck (*Malacorhynchus membranaceus*) and Australasian shoveler (*Anas rhynchotis*). They occurred at one pond on the north-eastern embankment, beside a recently installed activated sludge plant, a popular bird feeding site. All birds were found dead without

previous demonstration of any abnormalities or illness. Autopsies on numerous birds failed to indicate an aetiological agent; avian influenza was ruled out using the Influenza A Symbiotics Antigen detection assay and negative results on egg inoculation. Birds were generally in a good condition, with many in moult. Histological evidence of acute pulmonary oedema and fluid in lungs, air sacs and nasal cavities were common findings. These changes were consistent with drowning. The possibility of a toxin that either killed or weakened the birds was considered; however, extensive carcase and water testing failed to support this hypothesis. *Clostridium botulinum* has been incriminated in many large-scale waterbird mortalities worldwide, but the failure to find clinically affected birds or toxin has not supported this as a cause. *Microcystis* sp. (blue-green algae) intoxication has also not been evident. Given these findings, causes of death other than intoxication were investigated. Both species of duck were undergoing their annual moults, rendering them flightless during the relevant period. The most likely risk factor to flightless birds was considered to be the large drop inlet pipes, approximately 1.5 metres in diameter, which are situated in a lagoon beside the activated sludge plant and siphon water under the embankment to a neighbouring lagoon. It was hypothesised that a small proportion of a large flock would be unable to avoid being sucked down the pipes, leading to death by drowning. With flock numbers in the thousands, significant mortalities could conceivably ensue. Continued investigations have supported this theory, and a recommendation has been made to install mesh covers over the pipe openings.

Undernutrition in an elephant seal (*Mirounga leonina*)

An immature male elephant seal was euthanised by Melbourne Zoo veterinarians in February 2006, due to its rapid deterioration. The seal had been spotted at many beaches around Port Phillip Bay.

Post mortem examination revealed a lack of subcutaneous fat and depletion of internal fat reserves. There was a linear scar on the ventro-lateral skin of the neck; however, there was no evidence of muscle or bone damage underneath. There were no significant findings on histology, although it was noted that there was an accumulation of bilirubin in hepatocytes, and that yeasts and hyphae were present in the superficial skin layer. It was concluded that no significant primary disease process was occurring. The atrophy of adipose and lymphoid tissue was consistent with a chronic energy deficit, as was the accumulation of bilirubin within the hepatocytes. The fungi in the skin were not producing significant changes, and may be another manifestation of undernutrition. It was suspected that this seal failed to make the trip back out to the continental shelf where seals feed on large squid after a period ashore. The volume and type of food required to sustain an elephant seal of this size is not available in Port Phillip Bay.

Western Australia

Contributed by: Fiona Sunderman, Department of Agriculture, Western Australia

During the quarter, 296 investigations of animal disease led to laboratory testing. There were five exotic disease alerts and no notifiable disease reports.

All five exotic disease investigations were category 1 alerts (low index of suspicion). Four of these, in poultry and other avian species, resulted in routine exclusion of avian influenza and Newcastle disease. One investigation in cattle ruled out foot-and-mouth disease and vesicular stomatitis. A diagnosis of an endemic disease was made in all five cases.

Bovine

The quarter saw few cattle cases, but a cluster of cases of pneumonia in calves was reported during January 2006. One of these proved to be a reappearance of ‘summer pneumonia’ in 6–8-week-old calves from a property in the Brunswick region. This disease, which is caused by *Haemophilus somni* (previously known as *Actinobacillus actinoides*), occurred regularly in this region during the 1970s.

Another interesting case was diagnosed at Benger, where numerous syncytia were seen in the lungs of one of several calves suffering from pneumonia and diarrhoea. The syncytia hinted at the primary involvement of the bovine respiratory syncytial virus.

Pneumonia due to *Mannheimia haemolytica* and *Arcanobacterium pyogenes* was diagnosed as the cause of deaths and illness in 20 out of 50 calves at Ruabon. Pneumonia and losses in a Busselton feedlot were also attributed to *M. haemolytica* and *Pasteurella multocida*. Of 3000 cattle, 33 died and

another 70 were affected. Examination of one dead animal revealed pleural adhesions and consolidated lungs with an anterio-ventral distribution.

Systemic mycosis was diagnosed in one of a group of 300 mature Friesian cows at Yarloop; the cow had fever and epistaxis and eventually died. The cow had calved one month earlier and was in good body condition; however, on autopsy, the lungs were congested and reddened and contained grey-yellow nodules. The liver was swollen, with grey-yellow foci. The kidneys were swollen and had white, raised spots on the surface.

Bovine polioencephalomalacia (PEM) was considered to be the cause of the deaths of five out of 40 cows on agistment at Mt Barker. Before death, the animals displayed staggering, incoordination and recumbency. The brain of a six-tooth cow that failed to respond to treatment was found to have histological lesions characteristic of PEM.

Ovine

Salmonellosis combined with lupinosis was diagnosed in a flock of 350 merino wether lambs at Doodlakine that had signs of weakness, diarrhoea and death. Two animals were examined. One had a subacute, multifocal, fibrinous bronchopneumonia and mild hepatopathy (consistent with exposure to phomopsins) and hepatic necrosis (consistent with salmonellosis). *Salmonella* spp. were recovered from liver, kidney, and mesenteric lymph node. There was convincing evidence of severe chronic lupinosis in a second lamb.

Ovine lupinosis and rumenitis were responsible for scouring and death in 18-month-old Border Leicester/merino cross lambs at Perenjori. Of 600 sheep, 12 died and another 20 were sick. The sheep had been on lupin stubble since November 2005. Two days before the deaths started, they were moved onto wheat stubble and drenched. The livers of both autopsied lambs contained lesions indicative of chronic but low-grade lupinosis.

Arthritis/synovitis is a continuing problem in a flock at Esperance; 50 sheep per year are affected by swollen joints and lameness. Typically, the swollen joints contain cloudy purulent fluid. *Erysipelothrix rhusopathiae* was isolated from culture. The number of cases of erysipelas involving arthritis or cellulitis after shearing or dipping during 2005–06 has increased. It is not known whether this represents an increase in reporting of the disease or an increase in the prevalence of ovine erysipelas.

Porcine

Vegetative endocarditis was found in the heart of one of 40 anorexic and lethargic eight-week-old weaner pigs at Cunderdin. *Streptococcus suis* type II was recovered from heart cultures. Bacterial endocarditis is not an uncommon result of streptococcal septicaemia.

K88 colibacillosis was found to be the cause of pre-weaning mortalities in 2–3-week-old piglets at Beverley. K88-positive haemolytic *Escherichia coli* was recovered in pure growth from intestinal and peritoneal swabs.

Avian

Chlamydiophilosis, also known as chlamydiosis, ornithosis or psittacosis, was diagnosed in rosellas, red-capped parrots and pigeons during January 2006. Immunofluorescent examination of paraffin sections confirmed the diagnosis. Three cases were submitted within a short period from Busselton, Albany and the Perth suburb of Yokine. In each case, an unusually large number of birds had been found dead. The deaths of significant numbers of wild birds and the close chronological grouping of these cases in geographically separate areas are both unusual and interesting. Avian influenza was ruled out in two of these cases and is unlikely to have been involved in the third case.

Necrotic hepatitis was diagnosed in 27-week-old layers at Geraldton. Autopsy of several birds revealed consistent lesions — numerous white foci of 1–3 mm diameter in the livers and similar, but fewer, foci in the spleens. The lesions are very suggestive of bacterial septicaemia, possibly secondary to primary lesions in the proventriculus and gizzard.

Equine

An interesting case of fibrosing and suppurative pneumonia was diagnosed in a stock horse from the Kimberley region. The parenchyma of submitted lung sample had been replaced almost entirely by mature fibrous tissue, leaving remnant, distorted airways. The aetiology of the lesion was probably chronic pneumonia. Crofton weed (*Eupatorium adenophorum*), not known to be present in the Kimberley, produces similar lesions.

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 31 March 2006

State	Free
ACT	2
NSW	815
NT	-
Qld	59
SA	496
Tas	92
Vic	609
WA	154
AUS	2227

Enzootic bovine leucosis

Enzootic bovine leucosis accreditation programs have been operating in the dairy industries in Queensland and New South Wales for several years. Victoria, South Australia, Western Australia and Tasmania are undertaking a program of bulk milk testing of all dairy herds. Table 2 shows the number of dairy herds tested free of enzootic bovine leucosis at the end of the quarter.

Table 2 Dairy herds tested free of enzootic bovine leucosis at 31 March 2006

State	Free	Herds
NSW	1011	1037
NT	-	-
Qld	880	885
SA	384	384
Tas	525	525
Vic	5595	5655
WA	250	250
AUS	8645	8736

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 southeastern 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 3 shows the number of herds and flocks known to be infected.

Table 3 Number of herds/flocks infected with Johne's disease at 31 March 2006

	Cattle	Goat	Deer	Sheep	Total
NSW	114	11	1	1286	1412
NT	-	-	-	-	-
Qld	-	1	-	-	1
SA	54	1	1	70[a]	126
Tas	16	3	-	59	78
Vic	976	10	6	419	1411
WA	-	-	-	18	18
AUS	1160	26	8	1852	3046

a Six of these sheep 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, goats and alpacas; the numbers of herds or flocks that have reached a status of Monitored Negative 1 or higher are shown in Table 4.

Table 4 Herds/flocks with a Market Assurance Program status of at least Monitored Negative 1 at 31 March 2006

	Alpaca	Cattle	Deer	Sheep	Total
NSW	109	662	41	388	1200
NT[a]	0	0	0	0	0
Qld[a]	-	-	-	-	-
SA	44	264	18	207	533
Tas	1	110	2	31	144
Vic	21	334	4	88	447
WA[a]	0	0	0	0	0
AUS	175	1370	65	714	2324

a Herds/flocks in free or protected zones have a status of 'monitored negative 1' or better because of the zone staus

Lists of beef, dairy and alpaca herds and sheep flocks assessed in the Market Assurance Programs are available at 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).

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		Bovine ephemeral fever		Bluetongue		Enzootic bovine leucosis		Equine infectious anaemia		Equine viral arteritis	
	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve
Jan–Mar 2005	5251	536	1610	278	2686	194	3233	8	480	5	278	12
Apr–Jun 2005	2984	583	1458	356	4279	288	2874	0	570	3	251	8
Jul–Sep 2005	1936	476	1298	257	3399	343	2330	2	577	21	188	13
Oct–Dec 2005	4926	383	1586	252	8429	272	1526	3	719	14	343	6
Jan–Mar 2006												
NSW	228	94	302	39	576	6	597	0	130	0	112	6
NT	472	192	472	155	414	154	0	0	2	0	-	-
QLD	364	108	407	97	405	94	227	0	112	0	20	0
SA	0	0	0	0	0	0	869	0	2	0	2	0
TAS	-	-	-	-	-	-	81	0	-	-	-	-
VIC	171	0	119	0	3407	0	114	0	151	0	88	3
WA	432	0	21	0	867	0	1	0	65	0	51	0
AUS	1667	394	1321	291	5669	254	1889	0	462	0	273	9

Surveillance activities

Salmonella surveillance

The National Enteric Pathogen Surveillance Scheme (NEPSS) is operated and maintained on behalf of the Commonwealth and States/Territories 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 6 summarises salmonella isolations from animals notified to NEPSS for the quarter.

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

Table 6 *Salmonella* notifications, 1 January to 31 March 2006

	Avian	Bovine	Canine	Equine	Feline	Ovine	Porcine	Other	Total
S. Bovismorbificans	-	11	3	-	-	1	-	-	15
S. Dublin	-	14	-	-	-	-	-	-	14
S. Infantis	1	2	3	1	-	1	-	-	8
S. Typhimurium	13	65	1	11	2	20	2	-	114
Other	17	34	18	6	3	2	11	24	115
Total	31	126	25	18	5	24	13	24	266

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 the National Animal Health Information System each quarter (see Table 7).

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

Table 7 Notifications of zoonotic diseases in humans

	Q1 2005	Q2 2005	Q3 2005	Q4 2005	**Q1 2006**	Current quarter								
	AUS					ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total
Brucellosis	14	2	9	14	**25**	0	1	0	24	0	0	0	0	25
Leptospirosis	41	39	25	30	**48**	0	8	2	36	0	0	2	0	48
Listeriosis	15	12	11	17	**24**	0	8	0	1	2	0	5	8	24
Ornithosis	42	53	40	39	**38**	0	28	0	1	0	0	8	1	38
Q fever	100	124	97	80	**110**	0	46	0	47	5	0	9	3	110

National TSE surveillance program

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 8 summarises the activity of the program over the past five quarters. All specimens tested were negative for TSEs. Information about the NTSESP is available on the internet (at www.animalhealthaustralia.com.au/aahc/programs/adsp/tsefap/ntsesp.cfm).

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

Table 8 TSE Surveillance

	Jan–Mar 2005		Apr–Jun 2005		Jul–Sep 2005		Oct–Dec 2005		**Jan–Mar 2006**	
State	Ovine	Bovine	Ovine	Bovine	Ovine	Bovine	Ovine	Bovine	**Ovine**	**Bovine**
NSW	19	13	30	26	36	33	27	25	**16**	**15**
NT	0	0	0	15	0	6	0	5	**0**	**0**
Qld	0	30	7	34	6	53	1	37	**1**	**26**
SA	7	3	18	6	10	4	7	4	**4**	**3**
Tas	6	4	0	3	1	3	0	0	**1**	**2**
Vic	10	15	35	31	58	40	52	78	**12**	**20**
WA	62	5	17	8	9	9	67	11	**14**	**11**
AUS	104	70	107	123	120	148	154	160	**48**	**77**

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. Table 9 summarises NAQS activity in Australia over the past five quarters.

Contact: Jane Parlett, Australian Quarantine and Inspection Service, DAFF

Table 9 Summary of recent NAQS activity in Australia

	Jan–Mar 2005		Apr–Jun 2005		Jul–Sep 2005		Oct–Dec 2005		**Jan–Mar 2006**	
Category	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve	**Tested**	**+ve**
Aujeszky's disease	73	0	72	0	65	0	13	0	**0**	**0**
Avian influenza - highly pathogenic	122	0	186	0	58	0	-	-	**0**	**0**
Classical swine fever	73	0	72	0	65	0	13	0	**0**	**0**
Japanese encephalitis[a]	86	28	54	0	-	-	89	0	**5**	**0**
Surra - *Trypanosoma evansi*	117	0	77	0	79	0	84	0	**1**	**0**

a In 1995–97, animals at sentinel sites on islands in the Torres Strait, but not the Australian mainland, seroconverted to Japanese encephalitis (JE) during the latter part of the wet season (March–April). In March 1998, seroconversions occurred at a number of sites on islands in the Torres Strait, and for the first time on the mainland at the tip of Cape York Peninsula. Since 1999, sentinel pigs at Badu Island have seroconverted each wet season, and seroconversions have been detected on other central Torres Strait islands in surveys. In early 2004, sentinel pigs in the northern peninsula area on the mainland seroconverted, and JE virus was isolated. This was the first detection of JE on the mainland since 1998. Subsequently, feral pigs from south of Mapoon showed a pattern of serology consistent with exposure to JE virus, but the time of exposure is undetermined. The sentinel pigs in the northern peninsula area did not seroconvert in early 2005, and there has been no evidence of transmission of JE virus on the mainland in 2005. It remains unclear whether JE is established in central Torres Strait islands or is reintroduced from the island of New Guinea in monsoonal weather.

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 10, a total of 274 abortion investigations were performed during the quarter, all with negative results for bovine brucellosis.

Table 10 Surveillance for bovine brucellosis

	Abortion		Other reasons	
	+ve	Tests	+ve	Tests
Jan–Mar 2005	0	358	0	796
Apr–Jun 2005	0	253	0	1748
Jul–Sep 2005	0	343	0	1430
Oct–Dec 2005	0	201	0	1038
Jan–Mar 2006				
NSW	0	8	0	1271
NT	0	0	0	0
Qld	0	66	0	258
SA	0	0	0	17
Tas	0	2	0	40
Vic	0	18	0	213
WA	0	180	0	416
Total	0	274	0	2215

Tuberculosis

Australia was declared free from bovine tuberculosis (TB) on 31 December 1997, exceeding the 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 11 summarises results from the program.

Table 11 Results of the National Granuloma Submission Program

	Jan–Mar 2005	Apr–Jun 2005	Jul–Sep 2005	Oct–Dec 2005	**Jan–Mar 2006**
Submitted	650	760	540	488	**362**
TB +ve	0	0	0	0	**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 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 12 shows the number of times that insect trap sites were inspected for the Port Surveillance Program; no exotic insects or mites were detected.

Contact: Leigh Nind and Howe Heng, Biosecurity Australia, DAFF

Table 12 Ports Surveillance Program: number of inspections of insect traps

		Jan–Mar 2005	Apr–Jun 2005	Jul–Sep 2005	Oct–Dec 2005	**Jan–Mar 2006**
Ports	Asian bees	14	21	14	12	**7**
	Varroa mites	23	30	21	22	**28**
	Asian mites	23	30	21	22	**28**
	Tracheal mites	22	28	19	22	**22**
	Culicoides sp.	28	29	27	28	**27**
	Screw worm fly	28	29	29	24	**22**
NAQS	Screw worm fly	45	45	0	45	**45**

Suspect exotic or emergency disease investigations

There were 46 investigations of diseases suspected to be either exotic or a possible emergency reported during the quarter, as shown in Table 13. More details about some of these investigations can be found in the State and Territory reports.

Table 13 Exotic or emergency disease investigations reported, 1 January to 31 March 2006

Disease	Species	State	Month	Response	Finding
Anthrax	Bovine	Vic	Mar	2	negative
Australian bat lyssavirus	Bats	SA	Mar	3	negative
Avian influenza - highly pathogenic	Avian	NSW	Jan	2	adenocarcinoma
	Avian	NSW	Jan	2	negative (2 unrelated investigations)
	Avian	NSW	Jan	2	pharyngeal abscess
	Avian	NSW	Jan	3	fowl cholera
	Avian	NSW	Feb	2	chlamydiophilosis
	Avian	NSW	Feb	2	parasitic typhlitis
	Avian	NSW	Feb	2	bacterial septicaemia
	Avian	NSW	Feb	3	negative
	Avian	NSW	Feb	3	vitamin A deficiency
	Avian	NSW	Mar	2	negative
	Avian	NSW	Mar	3	negative (2 unrelated investigations)
	Avian	NSW	Mar	2	ascaridiasis
	Avian	NSW	Mar	2	Marek's disease
	Avian	NSW	Mar	2	parasitic ventriculitis
	Avian	NT	Feb	3	negative
	Avian	Qld	Jan	2	negative
	Avian	Qld	Jan	3	negative
	Avian	Qld	Jan	3	botulism (2 unrelated investigations)
	Avian	Qld	Feb	3	avian encephalomyelitis
	Avian	Qld	Feb	3	negative
	Avian	Qld	Mar	1	negative
	Avian	Qld	Mar	2	negative (2 unrelated investigations)
	Avian	Qld	Mar	3	negative
	Avian	Qld	Mar	2	infectious laryngotracheitis
	Avian	Qld	Mar	2	chemical poisoning
	Avian	Qld	Mar	3	avian pasteurellosis (fowl cholera)
	Avian	Tas	Jan	3	negative
	Avian	Tas	Feb	3	negative (3 unrelated investigations)
	Avian	Tas	Mar	3	negative
	Avian	Vic	Jan	2	negative (2 unrelated investigations)
	Avian	Vic	Feb	2	negative
	Avian	Vic	Mar	2	negative (4 unrelated investigations)
	Avian	WA	Jan	3	negative
	Avian	WA	Feb	3	negative
	Poultry	Vic	Feb	2	negative
Foot-and-mouth disease	Bovine	NSW	Jan	3	malignant catarrhal fever
	Bovine	WA	Feb	3	negative
	Ovine	NSW	Mar	2	contagious ecthyma
Hendra virus	Equine	NSW	Feb	3	chronic interstitial pneumonia
	Equine	Qld	Mar	3	negative
Newcastle disease - virulent	Avian	Tas	Jan	3	negative
	Avian	Tas	Feb	3	negative (3 unrelated investigations)
	Avian	Tas	Mar	3	negative
Post-weaning multi-systemic wasting syndrome	Porcine	NSW	Mar	2	enteric colibacillosis
	Porcine	Tas	Feb	3	negative
Screw-worm fly - Old World - *Chrysomya bezziana*	Avian	NT	Mar	2	Sacrophagidae
West Nile virus infection - clinical	Avian	NSW	Feb	3	chlamydiophilosis
	Avian	NSW	Mar	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)

National Residue Survey

There were 3483 samples collected and analysed in the NRS Random Monitoring Program for the quarter. Four samples were found with residues above the relevant standard in the Australian Food Standards Code.

One sample from a bobby calf was found with residues of neomycin, streptomycin, sulfadiazine and sulfadimidine all in excess of the maximum residue limit (MRL). A traceback investigation has been initiated. Such residues often result from failure to observe the withholding period for calf scours. One sample of liver from a cow had lead residues of 0.52 mg/kg, which exceeds the Australian Maximum Level (ML) of 0.5 mg/kg. A traceback investigation has been initiated. Lead residues in livestock are often the result of exposure of animals to old lead batteries or other lead sources dumped inappropriately on a property. Two samples of sheep liver had cadmium levels above the ML. Cadmium residues above the ML are a common finding in older sheep across southern Australia. While these cadmium detections were above the ML of 1.25 mg/kg for sheep liver, they were all below the action level of 2.5 mg/kg to initiate a traceback investigation. The results are summarised in Table 14.

Contributed by: Jim Derrick, National Residue Survey, DAFF

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	
Anthel-mintics	cattle	0	48	-	-	0	69	0	15	0	3	0	33	0	13	0	181
	other	-	-	-	-	-	-	-	-	-	-		2	-	-	0	2
	pigs	0	21	-	-	0	15	0	13	0	2	0	18	0	5	0	74
	sheep	0	112	-	-	0	10	0	42	0	7	0	63	0	60	0	294
	Total	0	181	0	0	0	94	0	70	0	12	0	116	0	78	0	551
Anti-microbials	cattle	0	90	0	1	0	95	0	17	0	5	4	51	0	17	4	276
	other	-	-	-	-		4	-	-	-	-	-	-	-	-	0	4
	pigs	0	66	-	-	0	44	0	35	0	2	0	51	0	24	0	222
	poultry	0	8	-	-	0	12	-	-	0	4	-	-	-	-	0	24
	sheep	0	132	-	-	0	20	0	43	0	2	0	67	0	67	0	331
	Total	0	296	0	1	0	175	0	95	0	13	4	169	0	108	4	857
Growth promotants	cattle	0	71	-	-	0	99	0	8	0	8	0	35	0	21	0	242
	pigs	0	50	-	-	0	32	0	31	-	-	0	29	0	13	0	155
	poultry	0	1	-	-	0	2	-	-	0	1	-	-	-	-	0	4
	sheep	0	96	-	-	0	13	0	24	0	3	0	30	0	49	0	215
	Total	0	218	0	0	0	146	0	63	0	12	0	94	0	83	0	616
Insecticides	cattle	0	88	0	1	0	122	0	22	0	11	0	65	0	23	0	332
	pigs	0	21	0	1	0	11	0	15	0	2	0	17	0	5	0	72
	sheep	0	172	-	-	0	13	0	50	0	7	0	88	0	107	0	437
	Total	0	281	0	2	0	146	0	87	0	20	0	170	0	135	0	841
Metals	cattle	0	18	-	-	0	31	0	4	0	2	1	14	0	6	1	75
	pigs	0	15	-	-	0	13	0	14	0	1	0	22	0	14	0	79
	sheep	0	29	-	-	0	6	0	9	0	2	1	26	1	17	2	89
	Total	0	62	0	0	0	50	0	27	0	5	2	62	1	37	3	243
Miscell-aneous	cattle	0	46	0	2	0	57	0	10	0	2	0	17	0	7	0	141
	other	-	-	-	-		2	-	-	-	-	-	-	-	-	0	2
	pigs	0	48	-	-	0	25	0	29	0	2	0	33	0	14	0	151
	sheep	0	27	-	-	0	4	0	13	0	1	0	19	0	17	0	81
	Total	0	121	0	2	0	88	0	52	0	5	0	69	0	38	0	375
Total		0	1159	0	5	0	699	0	394	0	67	6	680	1	479	7	3483

NAHIS contacts

The National Animal Health Information System (NAHIS) collects summaries of animal health information from many sources. NAHIS is on the internet (at 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
Chris **Bunn**	Emergency Disease Preparedness, DAFF	02 6272 5540	02 6272 3372	chris.bunn@daff.gov.au
Iain **East**	Australian Government NAHIS Coordinator	02 6272 3106	02 6272 3150	iain.east@daff.gov.au
Ian **Haynes**	Australian Milk Residue Analysis Survey	03 9810 5901	03 9819 4299	ihaynes@dairysafe.vic.gov.au
Jenny **Hutchison**	National Surveillance Coordinator	02 6287 4483	02 6287 4468	jenny@ausvet.com.au
David **Kennedy**	Johne's Disease Coordinator	02 6365 6016	02 6365 6088	david@ausvet.com.au
Jane **Parlett**	Northern Australia Quarantine Strategy	02 6272 3494	02 6272 3468	jane.parlett@aqis.gov.au
Diane **Lightfoot**	National Enteric Pathogen Surveillance Scheme	03 8344 5701	03 8344 7833	dligh@unimelb.edu.au
Peter **Miller**	National Residue Survey	02 6272 3762	02 6272 4023	peter.miller@daff.gov.au
Kevin **de Witte**	Animal Health Australia Project Manager	02 6203 3913	02 6232 5511	kdewitte@animalhealthaustralia.com.au
Neville **Spencer**	National Granuloma Submission Program	02 6271 6650	02 6272 5442	neville.spencer@aqis.gov.au
John **Walker**	National Notifiable Diseases Surveillance System	02 6289 1555	02 6289 7791	www.health.gov.au
Rupert **Woods**	Australian Wildlife Health Network	02 9978 4749	02 9978 4516	rwoods@zoo.nsw.gov.au
State Coordinators				
Barbara **Moloney**	NSW State Coordinator	02 6391 3687	02 6361 9976	barbara.moloney@dpi.nsw.gov.au
Francois **Human**	NT State Coordinator	08 8999 2246	08 8999 2024	francois.human@nt.gov.au
John **Cronin**	QLD State Coordinator	07 4688 1220	07 4688 1199	john.cronin@dpi.qld.gov.au
Celia **Dickason**	SA State Coordinator	08 8207 7803	08 8207 7852	dickason.celia@saugov.sa.gov.au
Mary Lou **Conway**	TAS State Coordinator	03 6233 6330	03 6278 1875	rmarylou.conway@dpiwe.tas.gov.au
Tristan **Jubb**	VIC State Coordinator	03 5430 4545	03 5430 4520	tristan.jubb@dpi.vic.gov.au
Fiona **Sunderman**	WA State Coordinator	08 9368 3805	08 9474 2479	fsunderman@agric.wa.gov.au

Disease Watch Hotline — 1800 675 888

The 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 Disease Watch Hotline, contact Jane McBride, Animal Health Australia.

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