ANIMAL HEALTH SURVEILLANCE

QUARTERLY REPORT
1 JANUARY TO 31 MARCH 2007
VOLUME 12 ISSUE 1

PREFACE

Although ongoing surveillance programs across Australia encompass a broad range of host animals and diseases, this quarter again sees a strong focus on avian influenza (AI). Results published in this edition of *Animal Health Surveillance Quarterly* (AHSQ) show that a number of AI strains of low pathogenicity are circulating in Australia's wild bird population. All strains isolated and characterised thus far are considered to be of Australian lineage and are readily distinguishable from 'Asian' strains in their genome sequence. Inevitably, the more surveillance we undertake, the more virus isolations we will find; however, it is reassuring that the results are strongly supportive of the notion that there appears to be little or no movement of AI viruses from Asia to Australia through bird migration. In addition, the report from the Australian Biosecurity Cooperative Research Centre describes a new, rapid laboratory technique to support the AI surveillance work.

This quarter has also seen a focus of activity on the review and assessment of animal health policy. Nationally, workshops on both bovine spongiform encephalopathy and foot-and-mouth disease reviewed the global, regional and national situation for these diseases and their implications for Australia's trade in live animals and meat. The workshops also examined the need to refine communications between governments, industry and trading partners. At the international level, the Animal Health Quadrilateral Group of countries met in New Zealand to further their cooperation in animal health matters. Discussions included a wide range of issues, from modelling of disease spread through animal welfare issues to arrangements for the International Animal Health Emergency Reserve — an initiative whereby the countries can assist each other by provision of veterinarians during a disease emergency.

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

Bob Biddle, Acting Australian Chief Veterinary Officer

CONTENTS

AnimalHealth AUSTRALIA
Australian Animal Health Council Ltd ACN 071 890 956

ISSN 1445-9701

Australian Biosecurity Cooperative Research Centre — update

Rapid diagnostic tests for avian influenza evaluated for national use

In response to the outbreak of avian influenza (AI) type H5N1 in Asia, Australia has taken steps to ensure that an adequate rapid diagnostic response system is in place for this highly pathogenic influenza strain. The Australian Biosecurity Cooperative Research Centre (AB-CRC) has funded Dr Hans Heine from the CSIRO Australian Animal Health Laboratory (AAHL) to develop two real-time reverse transcription tests: one to rapidly identify all AI type A virus strains and a second specific test for the H5 influenza virus. These two real-time diagnostic tests will be among the first to be assessed according to the new validation requirements for molecular tests, developed by the Subcommittee on Animal Health Laboratory Standards (SCAHLS).

'The AB-CRC fast tracked funding for this project to enable diagnosis of avian influenza in a matter of hours, allowing rapid response in case of an emergency', said Dr Debby Cousins, Director of the AB-CRC's Application and Linkage Program.

'Having funded the development of these tests, the AB-CRC was keen to make the tests available to all capable laboratories across the nation to increase Australia's capacity to detect incursions on a national basis', said Cousins.

Together with the Chicken Meat Research Program of the Rural Industries Research and Development Corporation, the Australian Egg Corporation Limited, the Australian Government Department of Agriculture, Fisheries and Forestry, and AAHL, the AB-CRC's Application and Linkage Program provided support and funding for technology transfer of the two real-time AI detection tests during 2006.

Training in the technology for the two tests was provided by AAHL at a workshop held in Geelong in May 2005. During 2006, the technology was transferred to State government laboratories in Victoria, New South Wales, Queensland, Western Australia, Tasmania, the Northern Territory, and a private laboratory in South Australia. New Zealand also participated in the technology-transfer exercise.

The robustness of the two real-time AI detection tests was tested in a trial across Australia and New Zealand. This trial helped AAHL to provide data for independent evaluation of the tests by an expert panel (under SCAHLS). The trial also helped to standardise the tests across Australia.

According to Cousins, laboratories across Australia and New Zealand were keen to participate in this trial because the real-time detection tests are important tools for Australia's and New Zealand's preparedness against AI. The trial was also an ideal opportunity to validate a test across multiple laboratories and compare results from five different sets of diagnostic equipment.

'This study has also provided a sound foundation of knowledge for transfer of additional molecular tests across the country', said Cousins.

A technical report is now available.[1] The paper 'Rapid detection of highly pathogenic avian influenza H5N1 virus by TaqMan RT-PCR' is in press in *Avian Diseases.*

For more information, contact:
Dr Hans Heine — for queries about test development and technology transfer
CSIRO AAHL — Geelong
Phone: 03 5227 5278
Email: Hans.Heine@csiro.au

Dr Debby Cousins — for queries about technology transfer, especially SCAHLS
AB-CRC Perth office
Phone: (08) 9266 1645
Email: debby.cousins@abcrc.org.au

Contributed by: Corinna Lange, Communication Officer, Australian Biosecurity Cooperative Research Centre for Emerging Infectious Disease

[1] http://www1.abcrc.org.au/uploads/ce407c64-9ae9-4859-9891-a1dadc165659/docs/ABCRCAvianInfluenzaTechnicalReport240305.pdf

Quadrilateral Group meeting

Paihia, New Zealand, 26–30 March 2007

In March 2007, New Zealand hosted the annual meeting of the Animal Health Quadrilateral Group (the Quads) in the Bay of Islands. The Quads comprises Australia, Canada, New Zealand and the United States. The four countries work cooperatively to share information; to align approaches and identify gaps; and to take a common position, where possible, on international animal health matters.

A number of Quads working groups reported at the meeting. The Emergency Management Working Group reported on its work with destruction, disposal and disinfection of diseased animals, as well as its progress on standardising emergency animal disease management competencies. The Emergency Management Working Group has also focused on epidemiological modelling, where international cooperation has allowed existing models from each country to be compared. The working group is currently developing methods for validating such epidemiological models.

The Foresight Working Group reported on its program for developing research, technology and policy relating to international animal health matters. This program includes proposals for workshops on stakeholder engagement and national communications. The Foresight Working Group will also examine opportunities for research collaboration across the four countries and will report to the Quads in 2008.

The Animal Welfare Working group reported on its activities for the year, and a new working group was established to examine high-level policies and strategies for animal disease surveillance.

The Quads meeting also considered the recommendations on zoning and compartmentalisation from a previous Quads workshop in Canada, in February 2007. These concepts can be used to help control disease and to minimise trade impacts during an animal disease outbreak. The Quads will continue to work on practical ways of implementing these concepts.

Australia facilitated a discussion to explore resource issues associated with implementing the International Animal Health Emergency Reserve during an emergency animal disease response. Resource issues include the need for support and administrative personnel in the donor and recipient countries, the need for personal protective equipment in the case of zoonotic diseases, and the need for support networks for returning personnel.

A short teleconference was held with representatives from the Five Nations Beef Alliance. A teleconference with industry has become a regular feature of Animal Health Quads meetings in recent years, as the discussion is useful even in the absence of major issues.

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

Bovine spongiform encephalopathy forum

A national forum on bovine spongiform encephalopathy (BSE) took place on 15 February 2007, with participation by government, industry and corporate representatives. The objectives of the forum included:

- reaching an understanding of the current global situation
- identifying the short- to medium-term implications of BSE for trade and public health
- refining communication arrangements.

The eight presentations covered international developments, the European Union (EU) evaluation of Australia's BSE controls, specified risk material (SRM) removal, communications, and a case study from New Zealand on 'atypical scrapie'.

Discussion on international developments included the current recategorisation of countries by the World Organisation for Animal Health (OIE) under

the new three-category system. The forum noted that BSE is becoming an increasingly rare disease as control measures become more effective. Also discussed at the forum were the recommendations from the recent EU BSE evaluation, which included comments on aspects of the feed ban and BSE surveillance. However, it was emphasised by Australia's Acting Chief Veterinary Officer that the final report should not affect Australia's current, most favourable, Geographical BSE Risk 1 rating by the EU.

Amendments to Australia's BSE preventative measures and further efforts to improve harmonisation between laboratories undertaking BSE analysis were agreed, in light of international developments and outcomes of the EU evaluation of Australia's BSE controls. The amendments included testing under the ruminant feed ban and changing the way Australia reports BSE surveillance to include subcategories of animals (downers, dead, etc).

The presentation on SRM, by Dr Reg Butler, outlined the recommendations for SRM removal according to OIE guidelines and described the list of materials known to have BSE risk. SRMs are removed from food in all countries that have reported an indigenous BSE case. The presentation summarised Australian requirements for bovine SRMs, stressing that there are no legislative requirements to remove SRMs in Australia (in accordance with international standards for countries with a negligible BSE risk), although significant effort has gone into SRM contingency planning in Australia.

The forum agreed that SAFEMEAT (a partnership between the Australian meat and livestock industry and State, Territory and federal governments), in consultation with human health officials, would prepare a detailed policy paper. The paper will build on substantial previous work on SRM removal from Australian food and feed, with the aim of facilitating government and industry consideration of the pros and cons of such a proposal.

Contributed by: Ed Klim, Product Safety and Integrity, Australian Government Department of Agriculture, Fisheries and Forestry

Foot-and-mouth disease forum

In February 2007, the Australian Government Department of Agriculture, Fisheries and Forestry, Animal Health Australia, and Meat and Livestock Australia hosted a foot-and-mouth disease (FMD) forum. The forum discussed sharing knowledge and understanding risk, changing trade arrangements, reviewing AUSVETPLAN developments, implementing recommendations from Exercise Minotaur, reviewing progress with the national FMD work program, and refining current communications strategies.

Dr Bob Biddle, Australia's Acting Chief Veterinary Officer, reviewed Southeast Asia's FMD situation, and recent technical developments and actions taken in the past 12 months. Support was given to Australia's continued inputs to Southeast Asia's FMD campaign (SEAFMD) and strengthening regional surveillance activities. The recent increase in reports of FMD outbreaks in Vietnam and other countries in the region was noted, as was the challenge of ensuring that Indonesia remains free from FMD. Participants also expressed concern that resources in Southeast Asia were being diverted from controlling FMD to avian influenza.

Some of the topics reported on during the forum included the following:

- The biosecurity risks posed by the rapidly expanding numbers of peri-urban farmers and farmers' markets.
- FMD vaccination in cattle, sheep and pigs and results of recent trials undertaken at the Australian Animal Health Laboratory. The forum recognised that there was an urgent need for further trials on the effectiveness of the vaccine in sheep and pigs.
- The Emergency Animal Disease (EAD) Action Plan and the progress of various projects. The list of projects will be revised in light of the forum outcomes.

- The dairy industry's approach to critical incident management. This approach was supported by other industry representatives present.
- The FMD hoax incident in New Zealand in 2005 and the lessons learnt.

The following concerns about specific animal health issues were raised by participants:

- concern from industry about being fully informed on relevant issues; industry requested more direct input into the planning and management of EAD programs
- concern about the ability of EAD decision-making arrangements to deal with new or emerging diseases that are poorly defined
- concern that the Australian livestock industry's competitive advantage from FMD freedom may be lost if markets did not retain their FMD-free status, or competitors gained FMD-free status.

The many issues raised during the plenary session are being assessed and incorporated into the EAD Action Plan.

Contributed by: Ian Denney, Manager Veterinary Services, Animal Health Australia

Aquatic Animal Health

Strengthening aquatic animal health capacity and biosecurity in ASEAN

During the past year, the Office of the Chief Veterinary Officer (OCVO) within the Australian Government Department of Agriculture, Fisheries and Forestry has been working with the Network of Aquaculture Centres in the Asia Pacific (NACA), AusVet Animal Health Services and the Aquatic Animal Health Research Institute (AAHRI) Department of Fisheries Thailand, to help deliver an aquatic animal health project under AusAid's ASEAN–Australia Development Cooperation Program's Regional Partnership Scheme. The project, 'Strengthening aquatic animal health capacity and biosecurity in ASEAN', helps to develop harmonised approaches to aquatic animal health management and biosecurity in the Association of Southeast Asian Nations (ASEAN), and to implement national aquatic animal health and biosecurity strategies that are aligned with ASEAN.

Policy workshops

The aquatic animal health project consists of a series of policy and technical workshops, as well as technical missions in four ASEAN member countries.

In April 2006, representatives from all 10 ASEAN countries participated in a policy workshop held in Thailand. The workshop:

- analysed the status of aquatic animal health management plans, capacities and institutional arrangements in ASEAN member countries
- identified gaps in these areas
- prepared an overall workplan and detailed outputs for the aquatic animal health project.

The second policy workshop will be held in May 2007 in Indonesia. The objectives of this workshop are to:

- review the progress made by ASEAN countries on the identified action plans from the first policy workshop
- develop agreements and build consensus on minimum harmonisation within ASEAN and identify ways to achieve this
- discuss and agree on ways of implementing standardised national strategies for managing aquatic animal health among ASEAN countries.

Technical workshops

The first policy workshop was followed in May 2006 by a technical workshop, held in Singapore. OCVO provided a resource expert to help run the technical workshop, where participants received training in the basics of epidemiology, disease outbreak investigation and risk analysis.

The second technical workshop was held in February 2007 in Vietnam. OCVO again provided a resource expert to support the workshop. Reports by the

participants indicated that several countries had made significant advances towards completing their work plans and had improved aquatic biosecurity in their countries as a result of the aquatic animal health project. The technical workshop focused on developing contingency plans for responding to emergency disease events. By the end of the workshop, each participating country had a generic contingency plan template that could be adapted to produce a specific contingency plan for their own country.

Technical missions

In the second half of 2006, OCVO representatives visited Cambodia, Laos, Burma and Vietnam as part of small teams conducting technical missions. The aim of the technical missions was to support the development and implementation of country-specific activities.

Some key outcomes of the technical missions were:

- identification of key national issues concerning aquatic animal health in each country
- development of a draft national list of diseases and increased awareness among the participants of how countries can access and use the NACA regional network of laboratories and experts
- development of a draft framework for passive surveillance and reporting, and development of a project proposal, for local aid agencies in each country, to pilot the passive surveillance framework
- development of a draft framework for contingency planning.

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

Australian Wildlife Health Network

During the past year, the Australian Government and State governments have improved the surveillance of avian influenza (AI) in Australia's wild birds by increasing the number of surveillance activities, including screening wild bird populations for both the high- and low-pathogenic strains of the virus. Investigating wild bird mortality events is a crucial component of the surveillance plan, and this report describes the network's recent activities.

AI virus was excluded as a cause of 12 wild bird disease events in Australia between January and March 2007. During this time, the Australian Wildlife Health Network coordinated testing (cloacal and faecal swabs, and blood samples) from 3072 wild birds in Australia. Sampling occurred at sites in all States except Queensland. The majority of samples were collected from waterbirds (e.g. ducks and waders), with a smaller number from other species, such as shearwaters and gulls.

From January to March 2007, no highly pathogenic AI viruses were isolated. However, one low-pathogenic H7N2 virus was isolated from a live adult Pacific black duck as part of routine surveillance in Tasmania.

Since July 2005, no highly pathogenic AI viruses were identified; however, 15 low-pathogenic subtypes were identified. These virus types came from ducks, silver gulls and a red-necked stint and were identified in Tasmania, New South Wales and Victoria. Major surveillance activities for AI in wild birds are continuing.

Other key investigations of the Australian Wildlife Health Network are described below.

Investigation of mass or unexpected mortalities, and morbidities of unknown causes

During this quarter, 21 mass mortality events involving birds have been reported to the Australian Wildlife Health Network (nine events in South Australia, seven in Queensland, three in New South Wales and two in Western Australia). Intoxication was diagnosed or is suspected as being the cause of death in 13 of the events. Cause of death was unable to be determined, or is currently under investigation, in eight other events. In these cases, AI virus has been ruled out, as have other diseases, such as West Nile virus (WNV) and Newcastle disease virus (NDV).

In South Australia, two events involving groups of 17 and 12 rainbow lorikeets (*Trichoglossus haematodus moluccanus*) and one event involving approximately 150 musk lorikeets (*Glossopsitta concinna*) are awaiting results of pesticide screening. Toxicology testing is also occurring as part of the investigation into six other, separate mortality incidents involving several bird species from other locations in South Australia. The majority of deaths have been associated with fruit-growing areas, and were localised and acute. AI virus, NDV and WNV have been ruled out, and pesticide intoxication is suspected.

Intoxication is also suspected in another incident, in which 25 captive little penguins (*Eudyptula minor*) died at a facility on the Gold Coast, Queensland, during March 2007. The cause of death is suspected to be associated with hydrogen sulfide toxicity.

Botulism was diagnosed as the cause of death of approximately 100 Pacific black ducks and chestnut teal (*Anas castanea*), which died at Curl Curl Lagoon in New South Wales over a 1-month period in late February and March 2007.

Incidents of relevance to human health

Lead intoxication was the cause of death of insect- and nectar-eating birds in Esperance, Western Australia (reported in last quarter's *Animal Health Surveillance Quarterly*, Vol. 11 No. 4, p6). The lead intoxication was associated with atmospheric pollution by lead carbonate, which is exported from the Port of Esperance. This incident shows the value of wildlife as indicators for issues that may affect human health. The Department of Health in Western Australia is now managing the incident.

A second incident at a mining site in Western Australia, involving several bird species with signs of internal haemorrhage, is currently under investigation. The initial toxicology test results are positive for arsenic and cyanide. Investigations are continuing.

Finally, chlamydophilosis was diagnosed as the cause of death in a captive group of eight superb parrots (*Polytelis swainsonii*) with acute necrotising myocarditis at Goulburn in New South Wales in mid-March 2007.

More information is available on the Animal Health Australia website.[2]

Investigations of threats to biodiversity or endangered species

A 6-month-old southern cassowary (*Casuarius casuarius*) with a history of ill-thrift died at a captive facility in Queensland in February 2007. Post mortem testing showed the presence of granulomatous pneumonia and splenitis with large numbers of acid-fast bacilli, and *Mycobacterium avium* complex (serotypes unspecified) was cultured from the liver and spleen. The southern (or wet tropics) population of the cassowary is listed as endangered both in Queensland (*Nature Conservation Act 1992*) and nationally (*Environment Protection and Biodiversity Conservation Act 1999*). The northern (or Cape York) cassowary population is listed as vulnerable in Queensland (*Nature Conservation Act 1992*).

A captive 2-year-old Tasmanian devil (*Sarcophilus harrisii*) died suddenly at a captive facility in Queensland in January 2007. Despite extensive investigation, no diagnosis has been confirmed; however, poisoning by cane toad bufotoxin is considered the most likely cause of death based on clinical findings. This animal was moved to Queensland as part of the captive insurance population for Tasmanian devils, which has been set up by the Tasmanian Government and the Australasian Regional Association of Zoological Parks and Aquaria to help manage devil facial tumour disease.[3] The Tasmanian devil is listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Australian Wildlife Health Network is interested in receiving reports of wildlife incidents and definitive diagnoses of causes of death in wildlife in Australia. For copies of the network newsletter or digests, please contact Rupert Woods at rwoods@zoo.nsw.gov.au.

The information in this report is based on that submitted by network subscribers and network State and Territory coordinators. The network would like to thank all those who submitted information for this report.

Contributed by: Chris Bunn, Office of the Chief Veterinary Officer, Australian Government Department of Agriculture, Fisheries and Forestry, and Rupert Woods, Coordinator, Australian Wildlife Health Network

[2] http://www.animalhealthaustralia.com.au/programs/adsp/nahis/diseases/avchl.cfm

[3] http://www.dpiw.tas.gov.au/inter.nsf/WebPages/LBUN-5QF86G

State and Territory reports

New South Wales

Contributed by: Rory Arthur, Department of Primary Industries

Poultry

Chlamydophilosis

Chlamydophilosis (previously chlamydiosis or psittacosis) was diagnosed by immunofluorescent antibody tests in 2000 multi-age, free-range poultry in southern New South Wales. Deaths of up to 15 birds per day occurred, especially in newly introduced pullets. Both *Haemophilus paragallinarum* and *Chlamydophila psittaci* were found in affected birds. The former is likely to mask the presence of *Chlamydophila* sp. unless specific tests are used. The flock responded well to treatment with chlortetracycline.

Infection with *C. psittaci* is common in psittacines (parrots, lorikeets, cockatoos, etc), especially in aviaries, and has also been reported widely in turkeys and domestic ducks overseas and in Australia. This disease is often associated with human illness. The current cases demonstrate that chlamydophilosis should be included as a differential diagnosis for respiratory disease in chickens, even in cases where initial laboratory results confirm the presence of *Escherichia coli*, *Haemophilus* sp. or *Pasteurella* sp.

Cattle

Possible Ward's weed toxicity

Stock deaths often increase during a drought or after post-drought rain, because of ingestion of poisonous weed species or nutritional imbalances.

Plant poisoning is suspected to be the cause of 200 cattle deaths across the New South Wales western division in the past 4 months, at Balranald, Wentworth, Hillston, Cobar and Broken Hill rural lands protection boards. Laboratory investigation of tissues has identified a range of endemic disease agents, including pestivirus and infectious bovine rhinotracheitis (IBR).

Exotic diseases, anthrax and sporadic bovine encephalitis have been eliminated as possibilities.

Infected cattle had access to an introduced Brassicaceae species, Ward's weed (*Carrichtera annu*). Although Ward's weed has not previously been identified as a poisonous plant, the clinical effects associated with weeds in the Brassicaceae family (gastrointestinal tract and respiratory tract irritation, hemolysis and dehydration) have been observed in most cases.

The region has had less rain than usual for the past 15 years. Ward's weed has increased significantly during this extended dry period, and is now a major component of many semi-arid pastures of southwestern New South Wales. The availability of normal pasture species has been limited.

Suspect salmonellosis

Salmonellosis was suspected as the primary disease that killed 59 calves and more than 20 mature cattle in an isolated mob of 140 cattle in south-western New South Wales over a 4-month period. *Salmonella* Havana and *S.* Adelaide were cultured from a range of tissues, and *S.* Adelaide was isolated from water and mud samples.

Treatment and management changes did not stop spread of the disease. Cattle deaths began 2 months after initial calf deaths. The most consistent clinical signs in the cattle were discharge from the eyes and nose, weight loss and — towards the end of the course of the disease — a stiff, weak hind-limb gait. Other clinical signs were inconsistent with salmonellosis and included nervous signs, scouring and respiratory problems. This indicated that more than one disease agent was involved.

Salmonellosis and nutritional deficiencies may have resulted in immunosuppression of the cattle that showed a consistent lymphopenia. This may have activated IBR in the mob. A herpes-like virus was demonstrated in a tracheal sample. Antibody tests indicated low IBR immunity within the problem mob

and adequate immunity within an unaffected control mob.

Anthrax, rinderpest, bovine spongiform encephalitis, sporadic bovine encephalitis and a range of other diseases and toxic agents were ruled out on the basis of extensive laboratory testing and epidemiological assessments.

Anthrax

Eight isolated incidents of anthrax in cattle or sheep were reported in the quarter; four in the Condobolin region, two in the region bordering Victoria, one at Narrandera and one at Nyngan. All regions were in drought, and all cases occurred in areas where anthrax has been reported previously. In each case, quarantine and movement controls, tracings, vaccinations and disposal followed standard procedures, according to AUSVETPLAN, and losses were restricted to a few stock.

Ephemeral fever

A number of cases of ephemeral fever were diagnosed in far northern New South Wales, coinciding with increased infectivity of vectors over the summer months. The cases were characterised by sudden onset, fever and recumbency. The sentinel herds used in this region to monitor arbovirus exposure showed varying degrees of seroconversion. The seasonal conditions on the north coast were favourable for insect survival, so it was surprising that cases were not more widespread or reported earlier in the season. Vaccination against ephemeral fever is still not widely practised and is mainly confined to dairy animals, beef bulls and stud females.

Brassica poisoning

Brassica poisoning was suspected as the cause of blindness and central nervous system signs in four of 35 yearling, mixed-sex cattle in southeastern New South Wales. The cattle had been grazing a forage *Brassica* crop for 2 weeks. Three of the affected animals presented with blindness, aimless movement, drooling and reduced alertness to their surroundings. One heifer was recumbent and nonresponsive. All animals had elevated temperatures, and two had respiratory signs. A low exposure to lead was found in one affected steer (the paddock had a rubbish tip in one section) but clinical lead poisoning was ruled out.

The clinical syndrome of *Brassica* poisoning depends on the species of *Brassica* involved. It can cause photosensitisation, bloat and a range of other signs. In this case, *Brassica* poisoning caused a polioencephalomalacia syndrome (an inflammation of the brain caused by high plant sulfur levels) and a blindness syndrome (which is usually temporary). More poisoning problems are encountered with sheep than with cattle, but the blindness syndrome typically occurs in cattle.

Sheep

Heartwater exclusion in the arid zone

In this quarter, 80 lambs (in a mob of 300) died from an unusual case of blackleg (*Clostridium chauvoei*) near Cobar. Lambs were dying quickly after a short illness, with a clear, straw-coloured hydrothorax and pulmonary oedema. Affected lambs had had tail-docking rings applied about a week earlier, higher up the tail than usual. Typical blackleg lesions were seen in front of the rings. More ewe lambs were affected than ram lambs, because their extra fat cover at the base of the tail reduced circulation further around the tail-docking ring.

As part of routine exclusion of exotic diseases, samples were collected to rule out heartwater because of the hydrothorax and because field reports indicated that some sheep were carrying ornate kangaroo ticks of the *Amblyomma* genus, the same genus that transmits *Cowdria ruminantium* in Africa and the Caribbean islands.

Osteoporosis in lambs grazing on oats

During the quarter, 33 of 550 Dorset Horn/merino lambs grazing on oats died during the preweaning period on a property near Bombala in southern New South Wales. The lambs (which were about 3 months old) lost control of their hind legs and became recumbent. Laboratory investigation showed that the disabled lambs were affected by osteoporosis, and their chalky bones eventually fractured, especially in the heavier lambs, causing recumbency. Blood calcium levels were demonstrably low in some of the affected lambs.

The soils of the region are commonly deficient in calcium and phosphorus, because these minerals are sequestered in the acid soil profile. After the lambs were diagnosed with osteoporosis, they were fed a high-calcium supplement in the oat paddocks.

Subsequently, fewer fractured limbs or recumbent lambs were reported.

Salmonellosis in merino weaner lambs

Salmonellosis has caused significant losses on a drought-affected sheep property in the Mudgee area. A typical lamb selected for detailed examination was weak, had difficulty standing, and had a mild bottle jaw, a green scour and a temperature of 40.2^{o}C. The lamb was one of 1100 mixed-sex weaners being fed a barley, lupin and faba bean mix with lime and salt. The mix was trailed out in paddocks that were watered by dams or troughs. Cereal and poor-quality pasture round bales were also provided as needed in the paddocks.

A post mortem examination showed swelling and fluid accumulation of the small intestine and associated lymph nodes. Histological changes showed that all components of the small intestine wall were affected. In addition, the liver had signs of necrotising hepatitis.

Salmonella Typhimurium phage type 197 was isolated from mesenteric lymph nodes and intestinal content cultures. It was sensitive to ampicillin, trimethoprim, tetracycline and neomycin. It was resistant to sulfafurazole.

Chlamydophilosis in feedlot lambs

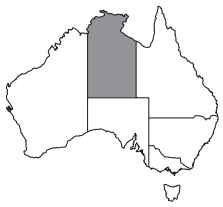
Infection with *Chlamydophila* sp. caused deaths and a range of clinical signs in 10 lambs, aged 12 months, in central-western New South Wales. These lambs were in poor condition and were being supplementary fed. Over 2–3 weeks, 30 out of 500 died. Many affected lambs had a cough with rapid breathing after mild exercise; many also had varying degrees of lameness with joint swellings. A few of the affected lambs also had scouring. All three clinically affected sampled lambs showed high antibody titres to *Chlamydophila* sp.

When the remaining clinically affected lambs were treated with oxytetracycline, many showed significant improvement. The severity of this problem was considered a consequence of the drought in the area.

Transit tetany in lambs

Transit tetany is a drop in blood calcium levels, caused by stress during transport. It contributed to the death of lambs in a feedlot in the Narrabri district. The problem was first observed 3 days after 750 crossbred store lambs, aged 4–5 months, arrived from the New England area. The lambs had access to forage sorghum green chop, which they were reluctant to eat at first. On the third evening after the lambs arrived, one lamb had hind limb staggers, but no abnormalities were noticed in the others. The next day, five lambs were found dead, and two were lying on their sides, exhibiting opisthotonos, slight mucoid diarrhoea, paddling of the limbs, raised temperatures, and panting and frothing at the mouth.

A post mortem examination excluded enterotoxaemia. The rumen contained a small amount of dry stalk material (no green chop). Transit tetany was diagnosed by rapid response to treatment with calcium and magnesium. Subsequent laboratory analysis showed low plasma calcium and magnesium levels.



Northern Territory

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

Hendra virus excluded

A horse from a rural block in the Katherine region lost its appetite and became lethargic over a 3-day period. It developed oedema of the infraorbital fossa, neck, ventral abdomen and perineum. The horse's body temperature, respiration and heart rate were elevated, and its heartbeat was irregular. Treatment with anti-inflammatories and antibiotics was unsuccessful, and the horse was euthanised 2 days later.

Repeat blood samples revealed increased numbers of neutrophils, followed 2 days later by a drop in mature neutrophils and an increase in the number of immature neutrophils. The main histological finding was a severe supparative and haemorrhagic bronchopneumonia. The appearance of the liver suggested ischaemia and acute circulatory failure. This was most likely from septicaemic shock that arose from an overwhelming bacterial infection or an endotoxaemia. There was a marked increase in urea and creatinine at the time of death. This, along with

low levels of dissolved solutes in the urine, suggested secondary renal failure.

The origin of the pneumonia could not be determined. No bacteria were cultured, probably due to antibiotic treatment during the period of illness. No other horses on the property have been reported ill. It is important to note that laboratory tests excluded Hendra virus.

Escherichia coli peritonitis in a poultry flock

The owner of an 18-month-old poultry flock in the gulf region of the Northern Territory reported low-level mortalities from August 2006 onwards. The flock of 220 commercial layers had two deaths per month on average. Sick hens showed weight loss, became lethargic and developed paresis before death. The illness lasted for a few days, but the affected hens were capable of eating and drinking until death. The flock also produced increasingly deformed and thin-shelled eggs.

A sick hen was euthanised for autopsy, and another frozen carcase was examined. Gross findings were similar in both hens: carcases were emaciated, with marked abdominal distension due to accumulation of coagulated, friable, yellow material in the abdomen, adhered to abdominal viscera and the oviduct. One hen had shell remnants in the oviduct, and the other was egg bound. A complete set of autopsy tissues was taken for laboratory investigation. Blood and faeces from the flock were submitted as well.

Histological examination of tissues confirmed a severe, chronic, suppurative (pus-forming) peritonitis and yolk intermingled with inflammatory exudate. There was also chronic suppurative infection of the oviduct. Bacterial cultures of organs and the coelomic exudate of both hens yielded *Escherichia coli*. Chronic *E. coli* peritonitis in mature hens can be a result of infection entering through the cloaca or via inhalation through the lung into the abdominal air sac. Parasitological examination of faecal samples revealed moderate numbers of ascarid-type eggs, most likely those of the caecal worm, *Heterakis* sp., and tapeworm eggs. Caecal worms are associated with ingesting soil or earthworms. The tapeworm eggs are probably those of *Raillietina* sp., the cause of nodular disease in chickens.

For a variety of reasons that are probably related to the tropical climatic conditions, it is common for commercial chickens in the Top End to experience laying problems, including nonproduction of eggs, egg binding and chronic peritonitis, after 12 months of production. The owner was advised on treatment and longer term prevention measures.

Queensland

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

Cattle

Bovine pestivirus

Bovine pestivirus was active across the Darling Downs, and the Western Downs in particular. Of 15 cases diagnosed, seven were positive by polymerase chain reaction (PCR) or enzyme-linked immunosorbent assay (ELISA) testing, indicating the presence of viral antigen. The remaining eight cases showed high seroprevalance on the agar gel immunodiffusion test, and the herds involved had poor overall herd reproductive performance.

Bovine ephemeral fever

Despite minimal rainfall in southern Queensland, resulting in less activity of the insect vectors, 14 cases of bovine ephemeral fever were diagnosed by PCR testing. The distribution of cases was across the southern, southeastern and eastern Darling Downs and southeast Queensland.

Bovine ephemeral fever was diagnosed in one 18-month-old Brahman in Thuringowa shire in March 2007. Two other cattle in the herd showed similar signs, including weakness, swollen joints, clear yellow nasal discharge, and difficulty in rising. All the cattle in the affected herd had been introduced from Burke shire. Blood samples tested positive by PCR for ephemeral fever virus.

Three separate incidents of bovine ephemeral fever in Townsville shire were also confirmed by PCR testing.

Salmonellosis

Salmonella group D was responsible for the deaths of six 16-week-old calves and sickness in another three calves out of 25 calves at risk on a dairy in Cooloola shire in early February 2007. Clinical signs of depression, anorexia, diarrhoea and death were observed. *Salmonella* group D was cultured from tissue samples. *Salmonella* group D was also found to have caused the sudden death of five 3-week-old calves out of 50 calves at risk on a property in Pine Rivers shire from late February to early March 2007.

Salmonella group B was cultured from several animals with acute diarrhoea in Esk shire in mid-February. The bacterium affected 15 out of 40 dairy heifers, aged 2 weeks, on a property.

Botulism (suspected cases)

Reports of botulism in cattle in western Queensland have increased during the past quarter. One property had 100 cattle die of suspected botulism although no post mortem abnormalities were seen. Some animals were observed to be ataxic and gradually became recumbent. The property owner did not vaccinate for botulism.

On another property in western Queensland, laboratory tests could not detect botulinum toxin but cattle deaths ceased after cattle were vaccinated for botulism.

A property near Bowen experienced a high death rate in one paddock in January 2007. Thirty out of 220 crossbred Brahman cattle, including one bull and three calves, died over 5 days after showing signs of posterior weakness and an inability to rise. Temperatures of animals were within normal limits. There was no vaccination history for botulism and no history of supplementary feeding. Gross pathology was largely absent. Laboratory findings ruled out other causes of death, such as anthrax, arsenic, lead, blue-green algae, tick fever, poisonous plants and nitrates. Because the mortality rate declined after the owner vaccinated against botulinum toxins C and D, botulism was considered the most likely cause of the deaths.

Anaplasmosis

A 5-year-old bull from Gatton shire presented with weight loss and weakness over 2 weeks. The bull had increased heart and respiratory rates, and the blood was watery on sampling. Haematology revealed a marked anaemia, with a haemoglobin concentration of 2.9 g/dL, packed cell volume of 10%, and an erythrocyte count of 1.39×10^{12}/L. A smear made for tick fever examination demonstrated the presence of *Anaplasma marginale*.

Lantana camara *poisoning*

Plant poisoning due to *Lantana camara* was presumed to have caused the death of an 18-month-old heifer and sickness in another heifer out of 35 cattle at risk in Caloundra shire in early March 2007. The cattle had been introduced 6 weeks earlier to a paddock with abundant red, flowering lantana. Clinical signs of photosensitisation were observed. Autopsy revealed extreme jaundice and dark-coloured urine. Histopathology revealed moderate to severe, subacute hepatopathy with canalicular cholestasis. A severe acute nephrosis was also found.

Sheep

Suspected humpy back

A farmer in Ilfracombe shire found 50 merino wethers dead and another 200 sick in March 2007. Affected animals showed ataxia and weakness in the hindquarters that progressed to recumbency and death. Some of the ataxic animals showed muscle spasms that became worse with exercise. Two field post mortem examinations revealed petechial haemorrhages in the skin and subcutaneous tissue of one sheep and fibrinous pericardial fluid in the other. Fixed tissues from the one animal submitted revealed mild Wallerian degeneration, particularly in the lower spinal cord. The heart contained occasional small foci of acute myodegeneration. The sections of diaphragm showed hypercontraction and degeneration of some myofibres. Kidney and spleen sections showed moderate haemosiderosis. A presumptive diagnosis of ‘humpy back’ was made on the basis of clinical history and histopathology.

Humpy back is a locomotor disorder in sheep that occurs throughout western Queensland. The disease occurs in summer after rain and is characterised by a short-stepping, stilted gait of the hindlimbs, followed by lowering of the head, arching of the back and inability to continue walking. On histopathological examination, Wallerian degeneration was seen in the white matter throughout the length of the spinal cord. The cause of the condition is still unknown.

Pigs

Swine dysentery

Swine dysentery was suspected to be the cause of diarrhoea, with 10 deaths and sickness in 160 pigs, aged 10 weeks, out of 800 pigs at risk in a piggery in southeast Queensland during mid-February 2007. Histopathology showed moderate to severe colitis, and stains revealed moderate numbers of spiral and serpentine bacteria within some crypts in affected areas of intestinal mucosa. A pyelonephritis was also detected.

Poultry

Mycoplasmosis and chronic pasteurellosis (fowl cholera)

Egg production in a shed containing 4000 layers on a Pittsworth shire layer farm dropped from 2800 eggs per day to approximately 1700 eggs per day over a 2-week period. Six live hens were submitted for autopsy. The birds were generally in good condition. One had a moderate cestode infection and only two were in lay. Some birds had a slight to moderate mucoid nasal discharge. On histological examination, all birds had a mild to moderate, subacute to chronic, mucopurulent tracheobronchitis and sinusitis. This was characterised by a mild mucoid exudate with a few granulocytes and degenerate cells, and a mild to moderate lymphofollicular infiltrate of the lamina propria throughout the upper respiratory tract. There was also mild oedema of uterine folds and very mild multifocal, predominantly lymphoid infiltrates in the lamina propria of both the uterus and magnum. *Pasteurella multocida* was cultured from the infraorbital sinus of two birds, and *Mycoplasma pullorum* was isolated from the trachea of three other birds. PCR testing for Newcastle disease, infectious laryngotracheitis and avian influenza was negative, as was virus isolation.

Goats

Suspected melioidosis

A 2-year-old female goat died of suspected melioidosis in the Thuringowa shire in March 2007. The goat presented with signs of weakness. Infection with *Burkholderia pseudomallei* was confirmed by a complement fixation test on a blood sample.

A sick 9-year-old male camel in the Townsville shire was also confirmed, by a complement fixation test on a blood sample, to have been infected with *B. pseudomallei*.

Horses

Equine infectious anaemia

A 14-month-old Australian stock horse from Mount Morgan shire presented with severe anaemia and emaciation. It had been purchased as an early weaned foal. Haematology revealed a marked anaemia (haemoglobin 4.3 g/dL, packed cell volume 11%, erythrocyte count 1.81×10^{12}/L) and a leucopenia (white cell count 2.26×10^{9}/L). A Coggins test (agar gel immunodiffusion) was positive for equine infectious anaemia antibodies.

South Australia

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

Xanthorrhoea (yacca) poisoning in cattle

In January 2006, a significant bushfire burnt large areas of the Ngarkat National Park in upper southeastern South Australia. A large area of a neighbouring cattle producer's property was also burnt, including large areas of native vegetation. The yacca species *Xanthorroea quadrangulata* and *X. semiplana* were dominant natives in these areas. A sequel to the bushfire was the rapid regeneration of these yacca species in the burnt areas. There was also significant proliferation of the flower spikes of these bushes.

In January and February 2007, approximately 75 cattle on the property died over a 2–3-week period. The cattle were from a group of approximately 230 mixed-aged cows. Initial clinical signs included urinary incontinence, tail head held high, some posterior incoordination and hind limb stiffness. Symptoms progressed to sternal recumbency and inability to rise. Recumbent animals initially appeared alert and mobile in their front quarters, but had restricted movement of their hindquarters. The hind legs were often outstretched behind the animal on the ground. Laboratory analysis

of post mortem samples from three animals did not help to identify the cause of this syndrome.

In January 2007, most cattle were removed from the paddocks that had burnt during the January 2006 fire; however, some cattle from the affected mob had grazed in this area and had eaten all the yacca flowers, leaving only the flower stems. In contrast, the yacca bushes in the adjacent national park all had flowers present on the stems. Groups of cattle that had been grazing in areas that were free from yacca species did not exhibit any abnormal clinical signs or experience any deaths.

Pasture availability was in short supply over the spring and early summer of 2006, and this was a major factor contributing to the selective grazing of the yacca flowers. Cattle were moved into other, yacca-free paddocks, and cattle deaths ceased about 6 weeks later. Some animals still showed mild signs of the condition but were left alone to recover on good pasture. *Xanthorrhoea* (yacca) poisoning was diagnosed on the basis of the described clinical signs, observations and similarity to previously documented cases.

The delayed onset of clinical signs is a characteristic feature of yacca poisoning. This can be up to 12 weeks after the last access to yacca flowers. Experience and the literature indicate that the syndrome is reversible. Cattle usually recover completely from the condition if they are removed from the yacca source and are nursed adequately with feed and hydration. Deaths due to yacca poisoning are uncommon.

Peracute haemorrhagic enteritis in cattle

In March 2007, the Department of Primary Industries and Resources, South Australia, helped to investigate a case of peracute haemorrhagic enteritis in 16 late-pregnant female dairy-cross cattle on a property in mid-northern South Australia. Breeder cows had been dying suddenly without premonitory signs. The cattle had been moved to the property during September 2006. Three heifers died overnight, 8 days after being moved from an exhausted pasture to a well-maintained lucerne pasture. Anthrax was ruled out.

Post mortem investigation of one heifer showed haemorrhagic enteritis, lung consolidation and generalised petechial haemorrhages. Most other cows from the same group calved during the next week, with half of them aborting or requiring obstetrical intervention with resultant stillborn or dead calves. The cattle were removed from the paddock and given meadow hay. Penicillin was given prophylactically to four aborting animals, two of which also died suddenly. *Salmonella* spp., *Yersinia* spp., *Coccidia* spp. and *Cryptosporidium* spp. were not detected on faecal culture. There was also no significant helminth infestation found. A heavy growth of *Clostridium perfringens* was cultured, and histopathology showed renal tubular necrosis and acute haemorrhagic enteritis. *C. perfringens* was considered the probable aetiological agent in this outbreak. The cattle had previously received full primary multi-strain clostridium vaccination at 7–8 months of age, but had not received any booster vaccinations. Nutritional stress during late gestation, followed by a surfeit of high-protein grazing, combined with altered gastrointestinal motility (common with feed restriction and heavy pregnancy) is conducive to abnormal enteric colonisation by *C. perfringens.* Based on the vaccination history, a presumptive diagnosis of *C. perfringens* type D enterotoxaemia was made.

Rectal prolapses in feedlot lambs

Over a 5-week period, approximately 30 lambs from a flock of 1200 6-month-old lambs of mixed breed and sex developed prolapsed rectums in a feedlot on the Yorke Peninsula. The lambs had been on mixed feed, including pellets, barley and peas, for 6–7 weeks. The feedlot pens were mostly unsheltered, and dry weather had caused significant amounts of dust to blow into the feedlot pens. The majority of affected lambs had been purchased from one property, so property-of-origin factors, such as tail-docking length, were considered but not found to be significant.

Affected lambs were in good body condition, and no petechiae or fibrin tags were seen in the thoracic cavity or lungs during post mortem examination of three of the lambs. The lungs were mildly consolidated on visual inspection; however, no pathogens were cultured. Two of three lambs showed focally mild to moderate suppurative bronchopneumonia (suggestive of *Pasteurella* infection), and one also had evidence of peribronchiole lymphoid hyperplasia (suggestive of *Mycoplasma* infection). It is most probable that infectious respiratory diseases, combined with dust inhalation, led to the chronic coughing and rectal prolapses.

Tasmania

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

Acute pasteurellosis in pheasants

In February 2007, 3700 of 4000 young adult pheasants died in the southeast of the State over a 4-day period — most within the first 48 hours. The affected birds had been moved in hot weather in three batches from grow-out pens to three release pens, less than 1 kilometre away. There were 2 days between the movement of the first and second batches and 1 week between the second and third batches. Each release pen had its own water supply from a dam. Water disinfection was not practised on the farm. Apart from wild birds and cattle, a large number of feral cats were known to live in the area. Before the outbreak, all affected pens had been fed whole wheat from the previous season.

Mortality varied between release pens, with 80% mortality in the first release pen populated, 50% in the second and 100% in the third. Signs observed initially were sudden death, with profound depression in surviving affected birds. Over the following 48 hours, mortalities decreased and an increasing number of affected birds were found lame.

Laboratory examination over the period revealed gross, microscopic and bacteriological findings consistent with acute avian pasteurellosis (fowl cholera). Initially, the gross pathology indicated a systemic infection, followed by localisation to the joints in the latter stages of the outbreak. Avian influenza, Newcastle disease and salmonellosis were excluded.

No unusual mortality or morbidity was observed in the chicks, growers or breeders before, during or since the outbreak, nor in a fourth release pen populated during the outbreak. Grower mortalities examined were negative for *Pasteurella* spp.

Notifiable diseases

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

	Investigations	
Disease	Positive	Total
Abalone ganglioneuritis	0	7
American foulbrood	2	3
Avian chlamydophilosis	0	3
Bacterial kidney disease (*Renibacterium salmoninarum*)	0	8
Brucella abortus	0	6
Brucella ovis	0	8
Brucella suis	0	1
Chalkbrood	0	3
Clinical salmonellosis	15	63
Devil facial tumour disease	4	19
Enteric redmouth disease (*Yersinia ruckeri* — Hagerman strain)	0	1
European foulbrood	0	3
Furunculosis (*Aeromonas salmonicida* ssp. *salmonicida*)	0	1
Goldfish ulcer disease (*Aeromonas salmonicida*, goldfish atypical strain)	0	1
Hydatid disease	0	7
Johne's disease	9	13
Leptospira hardjo	1	10
Leptospira pomona	0	10
Listeria monocytogenes	2	13
Marine aeromonad disease (*Aeromonas salmonicida*, marine atypical strain)	1	2
Pullorum disease (*Salmonella* Pullorum)	0	3
Q fever	0	5
Rickettsia-like organism of salmonids	4	15
Salmonella Abortusovis	0	7
Salmonella Enteritidis	0	7
Streptococcosis of salmonids (*Lactococcus gravieae*)	3	3
Transmissible spongiform encephalopathy	0	3
Viral encephalopathy and retinopathy	0	1

Laboratory accessions[a]

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

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

Photosensitivity in sheep

Two properties experienced primary photosensitisation in adult sheep grazing on drought-affected pasture along the Macquarie River near Campbell Town in February 2007. About 10% of each mob were affected. No liver damage was apparent on clinical pathology, and a toxic plant aetiology was suspected. Several weed species were found in the affected paddocks — *Mentha pulegium* (pennyroyal) on both properties, and *Lotus uliginosus* (greater birdsfoot trefoil) on one property. Sheep apparently seek out pennyroyal. All sheep subsequently recovered.

Victoria

Contributed by: Roger Paskin, Department of Primary Industries

Anthrax in the Goulburn Valley

Over 6 weeks in January–February 2007, 37 cattle died of anthrax on 10 farms at three distinct foci in the Goulburn Valley. One focus (involving multiple properties) was at Stanhope, and the other two (each involving single properties only) were at nearby Tatura and Wyuna. These appeared to be unrelated to the Stanhope focus. In each case, quarantine and movement controls, tracings, vaccinations and disposal followed the standard procedures in AUSVETPLAN.

Stanhope cases

Acute deaths in dairy cattle were reported starting from 19 January 2007 on a property near Stanhope in Victoria's Goulburn Valley irrigation area. Once anthrax was diagnosed, the Victoria Department of Primary Industries (DPI) immediately began quarantine, incinerating carcases, and vaccinating cattle on the affected property and neighbouring properties. Death sites were disinfected with formalin to reduce spore contamination.

More cattle died at the end of January on nearby properties, leading to a corresponding enlargement of the vaccinated area. Cattle on neighbouring properties were vaccinated in a ring two farms deep around infected properties, and on all properties within 1 kilometre of infected properties. A total of eight properties were affected, with 31 cattle deaths. The last confirmed case at this focus occurred on 12 February 2007.

Irrigation-related earthworks may have unearthed buried spores, thus precipitating this outbreak at Stanhope, and spores may have spread through the movement of insects, foxes or scavenger birds. None of the eight farms involved had ever reported anthrax before this year.

Tatura cases

At Tatura, a case of anthrax was diagnosed on a single property on 6 February 2007, and quarantine, incineration and ring vaccination were carried out as described above. Three cattle died on this property, with the last death being reported on 12 February 2007. This farm had had cases of anthrax in the 1997 outbreak, and yearly vaccination was carried out between 1997 and 2000 (as is carried out on all farms in Victoria where anthrax is detected).

Wyuna cases

At Wyuna, the first case of anthrax was diagnosed on 18 February 2007; a total of three cattle died, with the last death on 23 February 2007. Again, a ring vaccination policy was instituted. This farm had never reported anthrax before this year.

In addition to the vaccinations cited above, the DPI vaccinated cattle and sheep on all properties known to have been infected in outbreaks since 1997, because climatic conditions were clearly favourable for anthrax.

General controls

Knackery (renderer) surveillance was quickly implemented. This involved screening all livestock presenting at the local knackery with sudden death or a history that suggested anthrax. No anthrax-positive stock were detected at the knackery during this period of just over 2 months; however, cases were detected on farms through farmer notifications, indicating that the level of reporting to the DPI by farmers and veterinarians was excellent.

A total of 34 604 cattle on 218 properties were vaccinated against anthrax in this incident.

Suspected blackleg in Angus weaners

Over a period of 6 weeks, five well-grown weaners died suddenly in a beef herd near Ballarat, in southwestern Victoria. The weaners were part of a herd of 30 mixed-age, unvaccinated Angus-cross cattle. A recumbent weaner rose when approached and ran away on three legs. The non-weight-bearing left forelimb had a massive swelling of the shoulder. This sixth animal was euthanised, and dissection of the shoulder muscles revealed a locally extensive, dark purple, soft, wet lesion leaking large quantities of foul-smelling, dark purple, bloody fluid. Samples submitted for histopathology were typical of *Clostridium chauvoei* infection (blackleg). This was the presumed diagnosis, although clostridia were not isolated.

Cyanobacterial (blue-green algal) poisoning in Hereford cattle

The sudden death of 18 Hereford cows and one bull out of a mob of 70 was attributed to cyanobacteria (blue-green algae) poisoning on a property in South Gippsland during February 2007. Most of the affected animals were found dead; however, four cows died after a short period of neurological signs, including body tremors and ataxia followed by depression. Gross changes in these cows were restricted to the liver, which had a red reticular pattern and multifocal depressed areas of approximately 1 centimetre in diameter on the surface. A property inspection found that the dams were low, and one of the dams in an adjoining paddock had a bright green, foul-smelling scum on its surface. Microscopic examination of dam water found high numbers of the cyanobacteria *Microcystis aeruginosa*. Histopathology confirmed centrilobular to massive necrosis of the liver, which was consistent with the presumptive diagnosis of cyanobacterial poisoning. Death of the bacteria releases a toxin into the water, and special testing is required to detect this toxin. *M. aeruginosa* spreads readily from dam to dam via spores that travel on the wind. Low dam water levels, followed by recent heavy rain and the influx of nutrients into the dam, led to ideal algal bloom conditions.

Enterotoxaemia in sheep

Six out of 180 crossbred lambs died suddenly in a sheep flock near Ballarat in southwestern Victoria in late February 2007. The lambs were in good body condition (with a score of three to four) and were grazing lucerne stubble and wheaten hay. They had been vaccinated with 6-in-1 at marking; however, they had not received a second dose. Enterotoxaemia was diagnosed on the basis of characteristic histological lesions in the brain. This case highlights the risks that primary producers take if they do not complete the recommended vaccination program, which is both effective and inexpensive.

Acidosis in feedlot lambs

Acidosis was the most likely cause of death in 12 lambs in a mob of 350 second-cross April 2006-drop lambs on a property north of Bendigo. The lambs had been placed into a stock containment area 10 days earlier for finishing before their anticipated sale. The deaths occurred within a few days of the lambs having ad lib access to a wheat lick feeder and silage hay. Autopsy on two lambs revealed rumens filled with approximately 90% grain and a small amount of fibrous material that had a typical acidic smell. The mob was removed from the stock containment area and placed onto a dry-land lucerne paddock. Deaths subsequently ceased.

Contagious ecthyma in crossbred ewes and lambs

An outbreak of contagious ecthyma (scabby mouth) was diagnosed in crossbred ewes and lambs in March 2007, on a property near Goroke in western Victoria. At shearing, brown scabs were noticed around the commissures of the mouth, spreading to the lips and nasal planum. A small percentage of ewes had severe scabs on both the top and bottom lips; however, most scabs were confined to the commissures, and no ulcerations were evident on the oral mucosa. The ewes had been held for 5 months in a stock containment area with 10-month-old lambs and fed

barley and canola hay via trail feeding and a self feeder. A sample of a fresh scab was collected, and an electron microscopy stain was positive for parapox virus. The lambs and ewes were in good body condition, and the clinical lesions did not appear to impair their ability to feed. A combination of the severe drought conditions and the abrasive nature of the canola hay, weeds and the self feeder could have been significant predisposing factors in this outbreak.

Mycoplasma peritonitis, pleuritis and mastitis in Saanen goats

Four 3-month-old Saanen kids in a herd of 15 died from mycoplasmosis in West Gippsland at the end of December 2006. Five kids were reported lethargic, depressed and pyrexic following vaccination with 5-in-1. They were treated with anti-inflammatory and antimicrobial medications, and intravenous fluids. One kid died during treatment, and three died during the next 48 hours. The fifth kid recovered. Gross autopsy examination revealed peritonitis with a fluid transudate, fibrin tags on the liver and intestines, a swollen inflamed omentum, enlarged mesenteric lymph nodes, and a fibrinous pleural effusion, with both lungs red and consolidated. Sternal and bronchial lymph nodes were also enlarged.

Initially, salmonellosis was suspected to be the cause of the peritonitis; however, submitted samples from the abdominal and thoracic cavities resulted in a positive *Mycoplasma* culture and were negative for *Salmonella*. This led to a suspicion of mycoplasma mastitis in one of the does. Subsequent milk cultures were positive for *Mycoplasma*.

Tick paralysis in chickens

Tick paralysis killed or caused the destruction of eight 10-day-old chickens in a batch of 18, in early January 2007 on a property near Bendigo. The affected chickens died over a 4–8-day period, and clinical signs included lethargy and lameness. Autopsy revealed a pale liver and an infestation of ticks (*Argas persicus)* on the skin of the chickens. Laboratory results diagnosed cutaneous infestation of the skin by ectoparasites and suggested that toxins resulting from tick paralysis may have led to bone marrow lesions, anaemia and weakness, manifesting in the nervous signs seen. The chicks were housed with sawdust flooring. Treatment of the environment and the remaining birds for parasitism was recommended.

Western Australia

Contributed by: Fiona Sunderman, Department of Agriculture and Food

During the quarter, 260 cases of animal disease were investigated in Western Australia. This included 46 investigations of suspected nationally notifiable diseases, although no cases were confirmed. There was also one notifiable disease report of liver fluke disease, which is notifiable in Western Australia, in a horse recently introduced from the eastern states. All 46 exotic disease investigations were a Category 1 alert (low index of suspicion) and in bird species involved routine exclusion of avian influenza and Newcastle disease. A diagnosis of an endemic disease was made in all cases. West Nile virus was excluded in one case of neurological disease in a horse, and foot-and-mouth disease was excluded in one case of lameness in a cow. The following sections provide details of the disease investigations during the quarter.

Cattle

Papular stomatitis was diagnosed in a group of calves at Bridgetown. The disease was characterised by 2–6-millimetre ulcerated lesions on the ventral surface of the tongue. The lesions were raised, pale, firm and slightly flattened. The calves showed respiratory and gastrointestinal tract signs before the lesions developed.

Annual ryegrass toxicity (ARGT) killed several cows on a Bridgetown property in November 2006. Numerous animals were seen staggering, collapsing, convulsing, and displaying muscle spasms and death (some sudden, some over several days) when they were yarded. Some recumbent cows appeared to recover, but calves that collapsed did not. The pasture was primarily rye grass, and there was little evidence of pasture improvement. Much rye grass seed had been spread for cattle feed the previous year. The ARGT enzyme-linked immunosorbent assay (ELISA) tests on rumen content and pasture samples were positive.

Sheep

ARGT was considered the probable cause of neurological signs and deaths of 130 merino ewes, aged 3–6 years, at Beverley. Affected animals exhibited opisthotonos, staggers and recumbency. The brain lesions were highly suggestive of ARGT. The paddock the sheep were in contained ryegrass, and no further deaths occurred after the sheep were moved to another paddock.

Zamia palm poisoning was thought to have killed a 5-month-old white dorper found wandering, dizzy, weak and staggering frequently on a Bullsbrook farm. A liver examination revealed widespread damage consistent with zamia palm poisoning.

Rumenitis was diagnosed as the likely cause of death of 11 Suffolk ewes, aged 8 months, at Gnowangerup over a 10-day period. The ewes had been in a feedlot for 3 months and were given access to lupins, barley and hay 4 weeks earlier. In another case, mature ewes in a Jerramungup feedlot became listless and lost body condition. The mob had been fed good-quality oaten hay and 75% barley/25% lupins ad lib in a self feeder. At Merredin, 10 of 280 merino hoggets died after accessing spilt grain at one end of the paddock into which they had recently been introduced. Severe rumen lesions were demonstrated in all cases, one with evidence of secondary fungal invasion — a common sequel to rumenitis.

Oxalate poisoning led to weakness, collapse and deaths of more than 70 of 250 lambs at Doodlakine. Their paddock contained approximately 1 hectare of iceplant around an empty dam. Autopsy of a dead lamb revealed iceplant in its rumen. There were lesions and oxalate crystals in both kidney and rumen. Deaths due to oxalate poisoning in such cases are more attributable to induced hypocalcaemia than to renal damage.

Salmonellosis led to the deaths of 20 of 335 mixed-age ewes at Pingelly, with another 30 or so sick. The mob had been yarded and drenched after 40 mm of rain in mid-December 2006. The animals had probably not eaten for more than 24 hours and were put straight onto oat stubble. Lambs had intestinal lesions, and *Salmonella* was recovered from multiple organs.

Vitamin E deficiency caused ill-thrift in a mob of lambs at Boyup Brook. Many of the lambs were in poor condition, and 100 of 600 died. Condition loss occurred after green feed died off in December 2006, even though supplementary feed (self-feeder oats with 10% lupins) was available. Low vitamin E levels and elevated muscle enzymes were seen.

Poultry

Necro-proliferative enteritis was diagnosed in several birds from a layer farm at Bullsbrook. The farm had a 15% loss of production in 54 breeder birds, aged 1 week, over the previous 3 months. Seven of eight birds submitted for post mortem examination had markedly dilated, thickened focal lesions of the jejunum.

Mycoplasmosis was diagnosed as the cause of chronic coughing and ocular discharge in a flock of ISA brown chickens at Dardanup. The chickens had been coughing in the preceding month and ocular irritation developed in the last week. Previous blood testing detected titres to *Mycoplasma gallisepticum*. The chickens had recently started laying, but production had decreased by 50% at 27 weeks of age. Lung lesions were highly characteristic of *Mycoplasma* infection, and serological tests revealed titres to both *M. gallisepticum* and *M. synoviae*. Bacterial culture yielded *Mycoplasma* sp. but speciation attempts by polymerase chain reaction were unsuccessful.

Aspergillosis was the cause of heavy mortality in a batch of 2-day-old pullets that were sent to two farms. Hatching percentage was higher than usual but the birds developed respiratory signs within 2 days. The death rate of one farm that received 5000 chicks was 4%; on the other farm, which received 500 chicks, the death rate was 10%. Post mortem examination of a number of chicks revealed multiple, cream-coloured foci throughout the lungs and air sacs of most birds. The lesions contained fungi with a morphology consistent with *Aspergillus* sp.

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 2007

State	Free
ACT	0
NSW	899
NT	0
QLD	58
SA	508
TAS	0
VIC	501
WA	171
AUS	2137

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

Table 2 Number of herds/flocks infected with Johne's disease at 31 March 2007

	Cattle	Goat	Deer	Sheep	Total
NSW	117	8	1	1286	1412
NT	0	0	0	0	0
QLD	0	1	0	0	1
SA	71	1	1	75[a]	148
TAS	16	3	0	58	77
VIC	965	6	6	469	1446
WA	0	0	0	17	17
AUS	1169	19	8	1905	3101

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

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

Table 3 Herds/flocks with a Market Assurance Program status of at least Monitored Negative 1 at 31 March 2007

	Alpaca	Cattle	Deer	Sheep	Total
NSW	116	572	35	334	1057
NT[a]	0	0	0	0	0
QLD[a]	0	0	0	0	0
SA	47	271	18	180	516
TAS	1	109	4	31	145
VIC	20	312	2	76	410
WA	0	0	0	0	0
AUS	184	1264	59	621	2128

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

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

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

Enzootic bovine leucosis

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

Table 4 Dairy herds tested free of enzootic bovine leucosis at 31 March 2007

State	Infected	Non-assessed	BMT[a] negative	Provisionally clear	Monitored free	Total
NSW	0	24	26	0	833	883
NT	0	0	0	0	0	0
QLD	2	0	0	0	882	884
SA	0	3	0	0	365	368
TAS	0	486	0	0	0	486
VIC	37	40	1852	25	3006	4960
WA	0	0	0	0	200	200
AUS	39	553	1878	25	5286	7781

a Bulk milk test

Laboratory testing

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

Table 5 Serological testing from routine submissions to State laboratories

	Akabane[a]		Bovine ephemeral fever[a]		Bluetongue[a]		Enzootic bovine leucosis		Equine infectious anaemia		Equine viral arteritis	
	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve
Jan–Mar 2006	1667	394	1321	291	5669	254	1889	0	462	0	273	9
Apr–Jun 2006	1970	460	1398	290	2492	297	1341	3	740	1	281	6
Jul–Sep 2006	2724	392	1302	152	6670	318	723	0	975	1	542	4
Oct–Dec 2006	7493	439	1931	313	10896	365	1946	8	1254	2	386	13
Jan–Mar 2007												
NSW	247	79	451	58	8493	38	261	1	661	0	191	0
NT	395	113	397	55	393	99	0	0	1	0	0	0
QLD	398	112	470	110	343	40	368	0	133	1	3	0
SA	8	0	1	0	872	0	10	0	5	0	3	0
TAS	0	0	0	0	0	0	0	0	0	0	0	0
VIC	1800	0	129	1	84	0	1457	0	268	0	173	2
WA	76	0	64	3	82	0	3	0	104	0	98	0
AUS	2924	304	1512	227	10267	177	2099	1	1172	1	468	2

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

Surveillance activities

National Transmissible Spongiform Encephalopathies 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 6 summarises the activity of the program over the past five quarters. All specimens tested were negative for transmissible spongiform encephalopathies. Information about the NTSESP is available at http://www.animalhealthaustralia.com.au/aahc/programs/adsp/tsefap/ntsesp.cfm.

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

Table 6 Transmissible spongiform encephalopathy surveillance

	Jan–Mar 2006		Apr–Jun 2006		Jul–Sep 2006		Oct–Dec 2006		Jan–Mar 2007	
State	Ovine	Bovine	Ovine	Bovine	Ovine	Bovine	Ovine	Bovine	Ovine	Bovine
NSW	19	18	16	17	27	34	65	24	28	12
NT	0	0	0	10	0	10	0	3	0	0
QLD	1	36	8	49	10	76	11	50	12	34
SA	4	3	4	5	15	13	41	3	14	4
TAS	1	2	1	2	0	6	7	1	0	1
VIC	13	23	47	32	36	39	44	15	11	14
WA	14	11	23	7	17	15	92	5	18	7
AUS	52	93	99	122	105	193	260	101	83	72

Bovine brucellosis

Although bovine brucellosis is now exotic to Australia, surveillance is maintained through abortion investigations and miscellaneous testing of cattle for export or other reasons. As shown in Table 7, 78 abortion investigations were performed during the quarter, all with negative results for bovine brucellosis.

Table 7 Surveillance for bovine brucellosis

	Abortion		Other reasons	
	Tests	+ve	Tests	+ve
Jan–Mar 2006	274	0	2215	0
Apr–Jun 2006	204	0	1702	0
Jul–Sep 2006	120	0	4456	0
Oct–Dec 2006	167	0	2383	0
Jan–Mar 2007				
NSW	2	0	660	0
NT	0	0	0	0
QLD	0	0	496	0
SA	0	0	3	0
TAS	1	0	5	0
VIC	1	0	290	0
WA	74	0	178	0
AUS	78	0	1632	0

Salmonella surveillance

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

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

Table 8 *Salmonella* notifications, 1 January to 31 March 2007

	Avian	Bovine	Canine	Equine	Feline	Ovine	Porcine	Other	Total
S. Bovismorbificans	0	7	0	1	1	4	1	2	16
S. Dublin	0	8	1	0	1	0	0	0	10
S. Infantis	0	1	2	0	0	1	4	0	8
S. Typhimurium	12	58	7	2	2	25	2	3	111
Other	15	37	8	4	4	5	11	25	109
Total	27	111	18	7	8	35	18	30	254

Tuberculosis

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

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

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

Table 9 Results of the National Granuloma Submission Program

	Jan–Mar 2006	Apr–Jun 2006	Jul–Sep 2006	Oct–Dec 2006	Jan–Mar 2007
Submitted	362	371	378	209	178
TB +ve	0	0	0	0	0

Northern Australia Quarantine Strategy

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

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

Table 10 Summary of recent NAQS activity in Australia

	Jan–Mar 2006		Apr–Jun 2006		Jul–Sep 2006		Oct–Dec 2006		Jan–Mar 2007	
Category	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve
Aujeszky's disease	19	0	16	0	147	0	225	0	0	0
Australian bat lyssavirus	0	0	4	0	0	0	2	0	1	0
Avian influenza — highly pathogenic	15	0	0	0	413	0	1835	0	0	0
Classical swine fever	19	0	16	0	147	0	225	0	0	0
Japanese encephalitis[a]	79	1	193	0	51	0	71	0	45	0
Surra — *Trypanosoma evansi*	10	0	334	0	124	0	185	0	156	0

a The positive result noted in the table for Japanese encephalitis (JE) occurred in a pig bled on one of the northern islands in the Torres Strait. These islands experience seasonal incursions of JE. JE remains exotic to the Australian mainland.

Ports Surveillance Program

Biosecurity Australia conducts the Ports Surveillance Program for *Culicoides* and screw-worm fly. Product Integrity, Animal and Plant Health in the Office of the Chief Veterinary Officer coordinates the program for 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 programs increase the capacity to detect any incursions at an early stage, and this in turn increases the probability of a successful eradication program. The *Culicoides* surveillance also supports the livestock export trade by confirming the continuous or seasonal absence of *Culicoides* vectors at ports from which livestock are loaded. Table 11 shows the number of times that insect trap sites were inspected for the Ports Surveillance Program; no exotic insects or mites were detected.

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

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

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

Suspect exotic or emergency disease investigations

There were 68 investigations of diseases suspected to be either exotic or a possible emergency reported during the quarter, as shown in Table 12. More details about some of these investigations can be found in the State and Territory reports.

Table 12 Exotic or emergency disease investigations reported, 1 January to 31 March 2007

Disease	Species	State	Month	Response	Finding
African horse sickness	Equine	QLD	Mar	3	negative
Avian influenza — highly pathogenic	Avian	NSW	Jan	3	negative
	Avian	NSW	Feb	2	negative (2 unrelated investigations)
	Avian	NSW	Feb	3	negative
	Avian	NSW	Mar	2	negative
	Avian	NSW	Mar	3	negative
	Avian	NT	Feb	2	negative (2 unrelated investigations)
	Avian	NT	Mar	2	negative
	Avian	QLD	Jan	2	negative (2 unrelated investigations)
	Avian	QLD	Feb	2	negative
	Avian	QLD	Mar	2	negative
	Avian	QLD	Mar	3	negative
	Avian	TAS	Feb	3	negative (2 unrelated investigations)
	Avian	WA	Jan	2	negative (9 unrelated investigations)
	Avian	WA	Feb	2	negative (13 unrelated investigations)
	Avian	WA	Mar	2	negative (14 unrelated investigations)
Foot-and-mouth disease	Bovine	NSW	Mar	3	negative
	Bovine	WA	Feb	3	negative
	Ovine	NSW	Mar	3	malignant catarrhal fever
Hendra virus	Camel	QLD	Mar	3	negative
	Equine	NT	Jan	3	bronchopneumonia
	Equine	QLD	Jan	3	negative (2 unrelated investigations)
Porcine reproductive and respiratory syndrome	Porcine	VIC	Jan	3	negative (2 unrelated investigations)
Screw-worm fly — Old World — *Chrysomya bezziana*	Bovine	NSW	Feb	2	negative
Varroasis — *Varroa destructor*	Bees	QLD	Mar	2	negative
Vesicular stomatitis	Bovine	NSW	Mar	3	negative
	Equine	SA	Mar	3	negative
	Ovine	NSW	Mar	3	malignant catarrhal fever
West Nile virus infection — clinical	Equine	WA	Jan	3	negative

Key to response codes

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

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 13).

Contact: National Notifiable Diseases Surveillance System, Australian Government Department of Health and Ageing (www.health.gov.au/internet/wcms/publishing.nsf/Content/cda-surveil-nndss-nndssintro.htm)

Table 13 Notification of zoonotic disease in humans

	Q1 2006	Q2 2006	Q3 2006	Q4 2006	Q1 2007	Current quarter (Jan–Mar 2007)								
	AUS					ACT	NSW	NT	QLD	SA	TAS	VIC	WA	AUS
Brucellosis	14	5	14	10	15	0	3	0	12	0	0	0	0	15
Chlamydophilosis	41	39	38	46	30	0	12	0	0	1	0	16	1	30
Leptospirosis	51	59	20	15	48	0	4	1	39	0	0	3	1	48
Listeriosis	25	7	14	13	17	0	7	0	3	1	1	4	1	17
Q fever	101	89	100	104	121	0	61	1	49	1	0	8	1	121

National Residue Survey

During the first quarter of 2007, 3963 animal tissue samples were collected and analysed in the National Residue Survey (NRS) Random Monitoring Program (see Table 14). The program found 11 samples containing residues above the relevant standard in the Australia New Zealand Food Standards Code.

One sample of kidney from a pig was found with residues of oxytetracycline (0.94 mg/kg; Australian maximum residue limit [MRL] 0.6 mg/kg). A trace-back investigation determined that the residue was caused by failure to observe the withholding period.

Two samples of fat from goats contained moxidectin residues (0.017 and 0.039 mg/kg; Australian MRL 0 mg/kg). Trace-back investigations are ongoing.

One sample of fat from a sheep contained abamectin residues (0.46 mg/kg; Australian MRL 0.05 mg/kg). A trace-back investigation is under way.

Three samples of liver from sheep were found with lead residues over the Australian MRL of 0.5 mg/kg. These samples contained 0.58 mg/kg, 0.53mg/kg and 0.89 mg/kg, respectively. In the first case, the trace-back investigation identified the cause of the residue as animals with access to a site containing old metal rubbish. The owner has been instructed to bury this material. In the other cases, no cause could be identified; however, lead residues in animals are often caused by exposure to old lead batteries or other lead sources dumped inappropriately.

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

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

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

		NSW		NT		QLD		SA		TAS		VIC		WA		AUS	
Anthelmintics	cattle	0	64	0	0	0	77	0	12	0	2	0	56	0	9	0	220
	other	1	16	0	0	0	18	0	3	0	0	1	16	0	0	2	53
	pigs	0	22	0	0	0	23	0	8	0	2	0	28	0	9	0	92
	sheep	0	125	0	1	0	9	0	44	0	2	0	87	1	78	1	346
	Total	1	227	0	1	0	127	0	67	0	6	1	187	1	96	3	711
Antimicrobials	cattle	0	87	0	0	0	111	0	21	0	9	0	53	0	13	0	294
	other	0	3	0	0	0	9	0	1	0	0	0	16	0	0	0	29
	pigs	0	68	0	1	0	54	1	43	0	5	0	58	0	41	1	270
	poultry	0	100	0	0	0	11	0	28	0	1	0	47	0	53	0	240
	Total	0	258	0	1	0	185	1	93	0	15	0	174	0	107	1	833
Growth promotants	cattle	0	92	0	0	0	126	0	10	0	5	0	40	0	8	0	281
	other	0	1	0	0	0	4	0	1	0	0	0	6	0	0	0	12
	pigs	0	39	0	0	0	32	0	30	0	5	0	41	0	27	0	174
	poultry	0	101	0	0	0	19	0	25	0	1	0	67	0	84	0	297
	Total	0	233	0	0	0	181	0	66	0	11	0	154	0	119	0	764
Insecticides	cattle	0	86	0	0	0	132	0	20	0	6	0	82	0	22	0	348
	other	0	30	0	8	0	54	0	12	0	1	0	18	0	4	0	127
	pigs	0	26	0	0	0	17	0	7	0	0	0	19	0	12	0	81
	sheep	0	178	0	2	0	25	0	64	0	6	0	101	0	136	0	512
	Total	0	320	0	10	0	228	0	103	0	13	0	220	0	174	0	1068
Metals	cattle	0	14	0	0	0	29	0	7	0	1	0	17	0	5	0	73
	other	0	8	0	5	0	24	0	4	0	0	0	12	0	5	0	58
	pigs	0	15	0	0	0	21	0	11	0	0	0	27	0	13	0	87
	sheep	2	44	0	0	0	2	0	8	0	0	0	21	5	18	7	93
	Total	2	81	0	5	0	76	0	30	0	1	0	77	5	41	7	311
Miscellaneous	cattle	0	19	0	0	0	32	0	5	0	3	0	20	0	6	0	85
	other	0	2	0	1	0	2	0	1	0	0	0	1	0	0	0	7
	pigs	0	27	0	1	0	22	0	9	0	1	0	20	0	11	0	91
	sheep	0	39	0	0	0	5	0	12	0	1	0	19	0	17	0	93
	Total	0	87	0	2	0	61	0	27	0	5	0	60	0	34	0	276
Total		3	1206	0	19	0	858	1	386	0	51	1	872	6	571	11	3963

NAHIS CONTACTS

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

Name	Role	Phone	Fax	email
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
Kristy Venten	Australian Milk Residue Analysis Survey	03 9810 5919	03 9819 4299	kventen@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
Jim Derrick	National Residue Survey	02 6272 4019	02 6272 4023	jim.derrick@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 8391 7125	08 8388 8455	dickason.celia@saugov.sa.gov.au
Mary Lou Conway	TAS State Coordinator	03 6233 6330	03 6278 1875	marylou.conway@dpiw.tas.gov.au
Roger Paskin	VIC State Coordinator	03 9217 4174	03 9271 4322	roger.paskin@dpi.vic.gov.au
Fiona Sunderman	WA State Coordinator	08 9368 3805	08 9474 2479	fsunderman@agric.wa.gov.au

EMERGENCY ANIMAL DISEASE WATCH HOTLINE — 1800 675 888

The Emergency Animal Disease Watch Hotline is a toll-free telephone number that connects callers to the relevant State or Territory officer to report concerns about any potential disease situation. Anyone suspecting an exotic disease outbreak should use this number to get immediate advice and assistance.

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

ANIMAL HEALTH SURVEILLANCE

This report was published by Animal Health Australia from information supplied by the many organisations that contribute to the National Animal Health Information System. The information in the report is subject to change as a result of additional or amended data being received. Readers are encouraged to reproduce and distribute information contained in the report, provided due acknowledgement is made of its source.

AnimalHealth AUSTRALIA
Australian Animal Health Council Ltd ACN 071 890 956