Animal Health Surveillance

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Preface

This issue includes updates on the management of ovine Johne's disease, and Australia's Animal Welfare Strategy. In addition, there are a number of reports of international activities and meetings, including the General Session of the OIE (World Organisation for Animal Health).

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, with detailed data being maintained by the source organisation. The information included in this report is accurate at the time of publication but, because of the short reporting and production time, minor discrepancies may occur. *AHSQ* is available on the Animal Health Australia website (at www.aahc.com.au/nahis).

Gardner Murray
Australian Chief Veterinary Officer

OIE General Session

The 72nd General Session of the OIE (the World Organisation for Animal Health) took place from 23 to 28 May in Paris. The occasion marked the 80th anniversary of OIE, which now has a membership of 167 countries. Australia is an active member of OIE and the Australian Chief Veterinary Officer, Gardner Murray, is President of the OIE Regional Commission for Asia, the Far East and Oceania.

A major outcome of the meeting was the agreement reached on new international disease reporting requirements. As from January 2005, Member Countries of the OIE will be required to meet new standards for notification of disease and epidemiological information. A single list will replace the previous Lists A and B. All significant epidemiological events will require notification to the OIE within 24 hours. The objective is to improve the efficiency of the OIE early warning system for the benefit of the international community.

Five new OIE Code Chapters covering bee diseases were adopted, although further work is required on them and revised Chapters will be considered at next year's General Session. Member Countries discussed the direction of revised international standards on avian influenza in the light of new understanding about the disease and its potential to infect humans. A set of guiding principles was adopted to underpin the animal welfare policies that the OIE will develop as part of its new mandate as the international reference organisation for animal welfare issues.

Both the Terrestrial and Aquatic Animal Health Standards are moving towards specifying those commodities that can be traded safely regardless of the animal health status of the exporting country, and away from the emphasis on disease-free status, although it is recognized that disease freedom remains a desirable situation for an exporting country.

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Two technical items were presented to the meeting. As a result of the first of these, the OIE will form a new Ad hoc Group on emerging and re-emerging zoonoses, with a multi-disciplinary membership. The second technical item was on animal identification and traceability, which can have a major impact on public health and trade. It was agreed that the OIE, in close collaboration with the Codex Alimentarius Commission, should determine a common definition for animal traceability and propose the creation of international guidelines for the development of animal identification and traceability systems.

The Working Group on Wildlife Diseases reported on the role played by wildlife in several recent outbreaks of zoonotic disease, such as Sudden Acute Respiratory Syndrome (SARS), avian influenza and West Nile fever. Australia has an expert on this Working Group, who will lead the preparation of a case study to assess the risk of accidental or deliberate spread of disseminating genetically modified organisms intended for use in wildlife and the international implications of such spread.

The Australian Animal Health Laboratory (AAHL) at Geelong was endorsed as an OIE Collaborating Centre for New and Emerging Diseases. AAHL was also granted OIE Reference Laboratory status for Hendra and Nipah virus diseases.

The final report of the meeting is available on-line (at www.oie.int/eng/en_index.htm).

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

Australia's new Animal Welfare Strategy

Ministers of Agriculture endorsed the Australian Animal Welfare Strategy (AAWS) at the May meeting of the Primary Industries Ministerial Council, creating a significant landmark for Australia's animal welfare activities. AAWS provides direction for development of future policies, and revision of existing approaches to animal welfare. It establishes a framework to clarify roles and responsibilities, and enables governments and stakeholders to engage in setting standards and priorities and to set strategic goals. AAWS builds upon historic and existing animal welfare arrangements in Australia, and recognises the intimate connection that exists between animal welfare and animal health and production.

Animals play an important role in Australian daily life due to:

- increasing recognition in the community that animals have an intrinsic value
- the important role of animals as a source of food, fibre and other products
- the important role of animals in Australia's history and development as a nation
- Australia's diverse and unique native animals, many of which figure prominently in indigenous culture
- the ongoing importance to tourism of Australia's diverse and unique native animals
- the strong cultural and sporting significance of animals, including the use of animals as a subject across the arts and as icons for our sporting teams
- the ongoing economic importance of the animal industries to Australia, and
- the dependence of many Australians on animals for companionship.

The Strategy is aimed at the whole Australian community and covers the care, uses and direct and indirect impacts on all species of animals in Australia. This includes animals used in research and teaching, animals used for the production of food and fibre and other products, companion and guide animals, animals used for recreation, entertainment and display, native and introduced wildlife and feral animals. The Strategy embraces a broad vision for all types of animals and sets broad national goals on animal welfare and provides a framework for sustainable, scientifically based improvements in animal welfare outcomes. It recognises animal welfare roles and responsibilities at levels that include the individual animal owner, animal industries, communities, and governments. It has a science-based approach to animal welfare but recognises the importance of other factors in setting animal welfare standards such as ethics, culture, societal values, economics, the environment and innovation. There is recognition of the open, consultative and consensual nature of Australia's federal, democratic and pluralist society.

The Strategy comprises a broad range of tasks, activities and products that may fall within the responsibilities of several groups within the community. An implementation plan is needed that includes an appropriate mechanism for national coordination to ensure effective monitoring and evaluation of progress, and the identification of any resourcing and funding implications of the Strategy. The Primary Industries Standing Committee agreed that the Primary Industries Health Committee would lead in the development of this implementation plan. Additional information is available on the internet (at www.daff.gov.au/naws).

Contributed by Peter Thornber, Animal and Plant Health Policy, DAFF

Animal Health Quadrilateral Discussions

Annual meetings of the Animal Health and the Food Safety Quadrilateral groups provide an opportunity for representatives from the governments of Australia, Canada, New Zealand, and the United States of America to discuss regulatory and scientific developments in the areas of animal health and food safety. The 2004 'Quads' were held in April in Vancouver, Canada. For the first time, members from Australian industries participated via teleconference, making significant contribution to the discussions.

Bovine spongiform encephalopathy (BSE) featured on the agenda. Topics of discussion included the simplification of the World Organisation for Animal Health (OIE) Terrestrial Animal Health Code chapter on BSE, risk management, and the changing global picture of BSE. The Quadrilateral countries agreed to continue to work towards common goals on managing the risks for trade and in progressing changes to international standards relating to BSE. Other discussions focused on the regionalisation of animal diseases and pests, and animal identification and traceability. It was noted that OIE and Quadrilateral working groups had made significant progress with animal welfare issues. In addition, Canadian officials gave a presentation on their approach to controlling the avian influenza outbreak that was occurring just outside Vancouver. Afterwards, Australian officials had the opportunity to observe operations at the local disease control centre at Abbotsford, British Columbia.

An important outcome of the 'Quads' meeting was the signing in May of an International Animal Health Emergency Reserve Agreement (see separate item in this newsletter).

Contributed by: Rob Williams, OCVO, DAFF

International Animal Health Emergency Reserve

The Chief Veterinary Officers of the United Kingdom, United States of America (USA), Canada, Ireland, New Zealand (NZ) and Australia signed the International Animal Health Emergency Reserve Memorandum of Understanding (MOU) on 24 May 2004. The MOU provides a framework for the exchange of veterinarians and other animal health specialists—such as laboratory diagnosticians and animal health technicians—between the six countries in response to animal disease outbreaks. It will also provide a platform to exchange information on new and emerging diseases.

Contributed by: Jill Mortier, OCVO, DAFF

Managing ovine Johne's disease: a new approach

Ovine Johne's disease (OJD) is caused by the sheep strain of *Mycobacterium paratuberculosis*. It was first diagnosed in Australia in 1980, but may have been introduced 20–30 years earlier than that via imported sheep. OJD was thought to have been confined to a region of central NSW for approximately 15 years after the initial diagnosis, and very little effort was made to control the disease. A strategic plan was developed to control OJD in NSW in the mid-1990s due to concern about the rate of spread and increased losses attributed to OJD. Detection of OJD in other states in the mid to late 1990s led to State control programs and national coordination of standards for disease diagnosis, control and assurance. Since 1997, Animal Health Australia has undertaken national coordination of Johne's disease control and assurance. One of the main objectives was to broker national financial assistance for affected producers who attempted eradication of OJD. This failed, but an independent review led to a six-year $40M National Ovine Johne's Disease Control and Evaluation Program (NOJDP) in 1998, which was funded by the wool and sheepmeat industries, and governments.

The NOJDP aimed to:

- provide, through an effective research and operations program, sufficient information to allow an informed decision to be made on the national management of OJD, including particularly, the feasibility and cost-effectiveness of eradication; and
- control OJD during the research period.

This program was completed in June 2004. Its research and surveillance component provided new knowledge and tools for more effective management of infection, but the regulatory control program (based on regional and property level movement controls) became unpopular, and largely ineffective, in the infected regions. OJD had spread more widely than anticipated and the program again failed to deliver meaningful assistance to affected producers. In addition, Johne's

disease had come to be viewed by many in the sheep industry as a government problem.

However, the Australian sheep industries have clearly stated that they want to continue to control the spread and impact of Johne's disease and to protect sectors of the industry that have little or no OJD . As a result, they have worked with Animal Health Australia and governments to implement a new National Approach to OJD on 1 July 2004.

The major components of the new approach are that:

- zones will be dismantled for the regulatory control of stock movements (except for Free Zones)
- vaccination will be readily available to assist disease control on-farm and reduce the risk of spreading infection
- sales of restocker sheep will be based on written vendor declaration of a standardised risk assessment score (Assurance Based Credit Scheme)
- jurisdictions may set requirements for sheep moving into and within their boundaries.

The Assurance Based Credit (ABC) Scheme assigns risk credits to consignments of sheep based on owner declarations on the following factors:

- if the flock is infected or suspected to be infected
- estimated flock prevalence in the region
- flock status attained by negative assurance testing
- effect of vaccination
- the certification of low risk groups within infected flocks (by approved veterinarians).

Credits are added to give a total ABC score that is capped at 10 for any consignment of sheep. The number of credits assigned to each factor is based largely on a quantitative risk assessment developed with support from Australian Wool Innovation. Each additional point represents an approximate four-fold decrease in the risk that the sheep are infected. Therefore, sheep in a consignment of score 4 are expected, on average, to be about 4^3 or 64 times less likely to be infected than in a similar consignment of sheep with a score of 1. The ABC provides a standard method of assessing risk for sheep buyers and also gives owners of infected sheep flocks a way to improve their assurance level and expand their sheep trading opportunities.

Successful implementation of the new approach requires a major cultural change among sheep producers and their advisers. However, this will only be achieved if an environment is created such that most producers are supportive and become educated and engaged in managing the risk to (and within) their herds and flocks. Animal Health Australia and industry and government stakeholders are currently working to develop that environment.

National Arbovirus Monitoring Program

The National Arbovirus Monitoring Program (NAMP) is a national program jointly funded by industry and government to monitor the distribution of economically important insect-borne viruses such a bluetongue, Akabane and bovine ephemeral fever (BEF) and their vectors.

This report covers the first half of 2004, when arboviral activity in northern Australia is expected. Drought persisted across a large area of eastern Australia during the period and this impacted on the distribution of arboviruses and their vectors. Neither seroconversions nor vector activity were detected in the southern states of Victoria, Tasmania and South Australia in the first half of 2004.

AKABANE VIRUS

Akabane virus activity was much more restricted than for the same period last year. This may be the result of persisting herd immunity created by the high level of widespread activity of this virus in 2003, combined with the ongoing effects of drought. Activity was detected in the north-west of Western Australia, and there was restricted activity in the Northern Territory. In Queensland, activity was detected in coastal sites, extending inland to the Darling Downs in the south of the State. In NSW, virus transmission commenced in January in the north-east and extended southwards along the coast to just north of Sydney by May, as well as westwards to the north of the New England Tableland by April.

BLUETONGUE VIRUS

Bluetongue virus activity did not extend beyond the current boundary of the zone of possible activity during this six-month period, as shown on the current Australian bluetongue zone map (available on the internet at www.namp.com.au/mapdownload.php). In Western Australia, transmission was detected in the Pilbara. In the Northern Territory, bluetongue activity was widespread from January. Serotypes 1 and 2 were the only serotypes identified. In Queensland, virus activity was detected in sentinel herds along the coast, the usual seasonal pattern for this area although more restricted than in 2003. Of particular interest is the lack of occurrence on the Darling Downs in the south of the State this year. No transmission was detected in New South Wales.

BOVINE EPHEMERAL FEVER VIRUS

Although more widespread than either Akabane or bluetongue viruses, activity of BEF virus was lower than for the same period last year with a low incidence of clinical cases reported. The only exception is the Northern Territory, which had areas of good rainfall with concomitant virus activity. The low level of activity in many other areas of Australia is, again, probably due to persistent dry conditions.

INSECT TRAPPING

Overall, vector activity appeared to be lower than in the previous year. In Western Australia, 18 species of *Culicoides* were collected, but numbers of all species were low and no exotic species were detected. *C. brevitarsis* occurred throughout the trapping area. *C. fulvus* was detected in the north-west of the State for the first time since 1997. In the northern part of the Northern Territory, all four species of *Culicoides* regarded as bluetongue virus vectors in Australia (*C. brevitarsis*, *C. fulvus*, *C. actoni*, *C. wadai*) were trapped, though *C. brevitarsis* was the most common and widespread species. In Queensland, *C. brevitarsis* was present along the east coast and adjacent inland. At inland sites, it was recorded for the first time in Dalby since winter. Otherwise, it was relatively rare. It was not collected at some sites where it had been present the previous quarter, such as Alpha and Goondiwindi, suggesting no westward spread from the coast. No other vector species were collected. Despite ongoing dry conditions in New South Wales, movement and numbers of *C. brevitarsis* were generally consistent with previous years, with activity ceasing in May at most sites. Exceptions to the pattern were apparent at Nowra and in the Hunter Valley. *C. brevitarsis* appeared to survive at Nowra with numbers peaking in late March and persisting until the end of April. One month after the peak at Nowra, *C. brevitarsis* was recorded at Bega on the south coast for the first time in many years. Movement up the Hunter Valley was consistent with predicted distributions, but was limited to the mid-Hunter region. No *C. brevitarsis* were found west of the Great Dividing Range. *C. wadai* was not recorded in NSW in 2003–04. No bluetongue vectors were detected at the 12 port sites monitored throughout Australia.

Contributed by: Chris Baldock, National Technical Coordinator, AHA's Animal Disease Surveillance Program

Avian influenza regional projects

Officers from DAFF prepared a proposal to AusAID for a $350 000 project to deliver short-term assistance to countries in the South-East Asian region that were at risk from, or had been affected by, avian influenza. The funded project had both laboratory and epidemiological components, and was carried out in May and June.

The Australian Animal Health Laboratory (AAHL) conducted training courses in laboratory diagnosis for participants from Indonesia, Myanmar, the Philippines, Vietnam and Nepal. As the reference laboratory for highly pathogenic avian influenza (HPAI) in the region, AAHL also supplied reagents in the form of starter kits to the same countries.

The OCVO organised and conducted a training course in Singapore from 10 to 12 May 2004. The training course focused very heavily on surveillance for HPAI as this had been identified as a critical issue in the region. The training course allowed participants to assess the ideal surveillance strategies for countries affected by HPAI and also for countries that were free from HPAI. Importantly, the training course encouraged participants to review their own surveillance programs in light of their limited resources.

The final component of the project involved a mission to Indonesia of a team of three epidemiologists and one virologist. The primary task of the epidemiologists was to review and assess the surveillance capacity for HPAI in Indonesia, and to recommend strategies to improve this capacity. The three State government epidemiologists (team leader Dr John Weaver from South Australia, Dr Glen Edmunds from New South Wales and Dr Andrew Cameron from Victoria) were in Indonesia for up to four weeks. Dr Edmunds spent most of his time in southern Sumatra, Dr Cameron covered the island of Java, and Dr Weaver concentrated his efforts on the islands of Bali, Lombok and Sulawasi. The virologist, Dr Geoff Gard, spent time at four laboratories: Balitvet on Java, Lampung in southern Sumatra, Yogyakarta on Java, and Denpasar on Bali. Dr Gard's primary focus was to provide bench-top training and to assess quality assurance procedures in the laboratories. Reports prepared for the Indonesian Directorate General of Livestock Services (DLGS) focused on both the surveillance and laboratory aspects of the mission.

FUTURE ACTIVITIES

Australia does have a competitive advantage in the delivery of some projects in the region. Accordingly, there are likely to be future projects funded by AusAID and FAO that will benefit from the expertise of Australian veterinary scientists.

Contributed by: Peter Black, OCVO, DAFF

Aquatic animal health

EXERCISE RAINBOW

A fish disease simulation exercise (Exercise Rainbow) based on the trout industry and developed by the Australian Government Department of Agriculture, Fisheries and Forestry was successfully conducted in May in Alexandra, Victoria. The exercise aimed to build the capacity within the Fisheries section of the Victorian Department of Primary Industries (VDPI) to appropriately apply aquatic animal emergency disease response procedures. During the exercise, 20 fisheries officers were introduced to components of the emergency disease management system, and 15 veterinarians and animal health officers were introduced to problems associated with disease management in aquatic systems.

The exercise examined difficulties associated with controlling a bacterial disease in the trout industry, and potential control methods suitable for closed hatcheries, ponds and flow-through systems. The exercise highlighted the good general awareness of emergency disease management procedures, but there are a number of opportunities for improvement or development of existing systems.

DATABASE OF DIAGNOSTIC LABORATORIES

A database that reports the diagnostic capability of Australian laboratories in the area of aquatic animal disease has been successfully designed and populated, and is operational on the internet (at www.affa.gov.au/content/forms/fishdiagnostic/search.cfm). The database includes data on 10 laboratories, 70 pathogens and 16 types of diagnostic test. Each of the laboratories conducted a review of their capability, then submitted the results for inclusion in the database. The database can be searched by laboratory, pathogen, type of test, or a combination of these variables. The contents of the database include the results of an informal review of the molecular diagnostic capability of the various laboratories held in January 2004.

AQUATIC ANIMAL HEALTH AWARENESS PACKAGE

A new aquatic animal disease awareness package has been released. The package consists of a CD-ROM, a website and a monthly newsletter. The CD-ROM commences with a brief video clip that explains the purpose of the CD-ROM is to increase awareness of aquatic animal health issues amongst the fisheries, aquaculture and recreational fishing industries. A menu allows access to a range of additional video clips containing approximately 90 minutes of video footage. A range of additional information is available as text documents, and an extensive range of links to other websites with aquatic animal health information is included. A button at the bottom of the screen allows the user to transfer to the companion website, located on the internet at www.disease-watch.com. This DISEASE WATCH—PLAY YOUR PART website will provide up-to-date information and new publications, thus extending the useful life of the CD-ROM. The video footage is also available in VHS video format.

FISH KILLS

At their May meeting in Darwin, the National Aquatic Animal Health – Technical Working Group concluded that the current level of fish kill investigations is inadequate to meet national requirements for surveillance and reporting. Wide ranges of approaches are used by different jurisdictions, and officers of these jurisdictions have differing competencies. If comprehensive fish kill reporting is to be achievable, then awareness must be raised within environmental agencies and it may be appropriate to use the services of the National Coordinator for the Australian Wildlife Disease Surveillance Network. Some states have developed manuals and training programs to assist in better reporting and investigation of fish kills, and it would be useful to share these resources so that they can be used nationally. A national workshop will be held to harmonise approaches to the investigation and reporting of fish kills, and to share existing resources.

DISEASE REPORTING GOES ON LINE

Each quarter, the eight States and Territories provide reports to the Office of the Chief Veterinary Officer (OCVO) on the occurrence of each of the 48 diseases on the Australian National List of Reportable Diseases of Aquatic Animals. The OCVO then collates the information into a national quarterly disease report to the Regional Commission of the OIE (World Organisation for Animal Health) and the Network of Aquaculture Centres in Asia–Pacific. Until now, the system was done by hand with the report prepared by a State/Territory rapporteur who then forwarded it to the State or Territory Chief Veterinary Officer for endorsement before dispatch to the OCVO. A new web-based system has been introduced where the rapporteur needs only to enter changes from the previous quarter's report, rather than complete a full new report. This new system auto-validates new entries according to previously entered data. When completed, the report is automatically forwarded to the State/Territory CVO for review and endorsement thus streamlining the reporting procedure. Eventually, a comprehensive database of disease events in aquatic animals will be assembled as quarterly reports accumulate in the central database.

Contributed by: Iain East, OCVO, DAFF

Australian Wildlife Health Network

The Australian Wildlife Health Network (AWHN) receives reports of wildlife incidents and definitive diagnoses of cause of death in wildlife in Australia. AWHN collects and coordinates data relating to bat viral infections. The Network appreciates and acknowledges the contributions from organisations and individuals that have been received. All contributions are recorded in the AWHN database, with details about selected incidents provided here.

The network assisted the Australian Association of Veterinary Conservation Biologists in organising a two-day session at the Australian Veterinary Association Annual Conference in Canberra in May. The focus of the session was wildlife disease investigation and surveillance, in the Australian context. Highlights included presentations on wildlife and avian influenza, the Northern Australia Quarantine Strategy (NAQS) program, West Nile virus, and the role of veterinary practitioners in surveillance.

Surveillance is an important activity supported by the Network. A workshop, organised by the Strategic Policy Unit of Product Integrity Animal and Plant Health, will be held in September. The purpose is to review current surveillance activities and consider the provision of appropriate surveillance data to the National Animal Health Surveillance Framework (NAHSF).

The network is distributing weekly bulletins to members of the Association of Avian Veterinarians, Birds Australia, wildlife carer groups, and others, advising them of the world avian influenza situation, with particular reference to matters relating to wild birds.

The Network's first annual report is now available and can be obtained by contacting the Coordinator (e-mail rwoods@zoo.nsw.gov.au).

CAPTIVE WILD ANIMALS

Chlamydiosis was diagnosed (by histology and an antigen ELISA test on liver) in a scarlet-chested parrot (*Neophema splendida*) held in a private collection in the Northern Territory.

A farm in the Northern Territory had experienced a low level of mortalities for a few weeks in juvenile farmed estuarine crocodiles (*Crocodylus porosus*). Two crocodiles were submitted for examination, and *Salmonella* sp. was isolated from both. Gram-negative septicaemia is common in juvenile farmed crocodiles in the Northern Territory dry season due to cool environmental temperatures.

Also in the Northern Territory, *Salmonella*-associated oesophagitis, septicaemia and possible cholecystitis were diagnosed in an olive python (*Liasis olivaceus*).

FREE-RANGING WILD ANIMALS

No viruses were isolated from the threadfin leatherjacket fish mortality episode on the central eastern Australian coast (reported in AHSQ Vol. 9, No. 1), and it is concluded that this was a natural (occasional) event.

Thirteen Australian king parrots (*Geoffroyus geoffroyi*) from the Healesville area in Victoria died over a two week period in late May. The presumptive diagnosis is spironucleosis (formerly *Hexamita*, a pyriform protozoan). The mortality rate of king parrots presented to Healesville Sanctuary with spironucleosis is approximately 50%. The prevalence of this condition in the wild population is unknown. The disease appears during the winter months, possibly due to cooler weather conditions and decreased availability of food.

Diazinon poisoning was responsible for the deaths of 73 Australian wood ducks (*Chenonetta jubatta*) from Legana (Tasmania), but it is unclear whether the poisoning was malicious or accidental.

A grey-headed flying-fox (*Pteropus poliocephalus*) from NSW had hepatic cholestasis and haemoglobinuric nephrosis of unknown cause, while a second animal had severe, subacute eosinophilic, pyogranulomatous, meningoencephalitis due to *Angiostrongylus cantonensis* (rat lungworm).

BAT VIRAL DISEASES

Summary data of bat virus testing throughout Australia for the last quarter are presented in the table below. Six animals were submitted for testing; there was one positive, and results are pending for one animal. The Network has not received any reports of bat viral disease testing in any of the other jurisdictions, or for any of the other bat viral diseases (Hendra, Menangle, Nipah viruses).

Contributed by: Rupert Woods, Australian Wildlife Health Network Coordinator, and Chris Bunn, OCVO, DAFF

Results of testing for bat viral diseases

DISEASE	STATE	CATEGORY	NUMBER	FINDINGS
Australian bat lyssavirus				
Black flying-fox (*Pteropus alecto*)	NT	2	1	negative[e]
Grey-headed flying-fox (*Pteropus policephalus*)	NSW	2	1	negative[a,c,e]
	VIC		1	positive
Eastern false pipistrelle (*Falsistrellus tasmaniensis*)	TAS	1	1	negative[a,b,c,d]
Lesser long-eared bat (*Nyctophilus geoffroyi*)	VIC		1	negative
Pteropus sp. (probably *alecto*)	NT	2	1	negative[a,b,c,d]
Pteropus sp. (probably *policephalus*)	NSW	2	2	1 negative[a,c] 1 positive [a, other results pending]

KEY to category:
1: routine submission (no suspicion of exotic or other emergency disease)
2: submission for exclusion of exotic or other emergency disease (remote likelihood of presence)
3: submission for confirmation of exotic or other emergency disease (high likelihood of presence)
Tested for Australian bat lyssavirus by: [a]fluorescent antibody test; [b]Taqman® assay specific polymerase chain reaction test for pteroid ABL on brain homogenate; [c]immunohistochemistry (immunoperoxidase test for lyssavirus); [d]isolation of virus; [e]histopathology on brain.

State and Territory reports

New South Wales

Contributed by:
Barbara Moloney
NSW Agriculture

INFECTIOUS LARYNGOTRACHEITIS

Infectious laryngotracheitis (ILT) was diagnosed in April in a backyard poultry flock from the Armidale district. About half of the flock of 53 birds died, and most of the rest were sick. Post mortem examinations were performed on 10 birds, and ILT was confirmed in one of these. The flock had been vaccinated against ILT two weeks previously, and factors other than ILT were thought to be contributing to the poor growth and emaciation observed in some of the birds. ILT was also confirmed in a backyard flock from Kyogle during June. ILT was diagnosed in four commercial broiler farms in the Rossmore, Kemps Creek, Camden and Schofields areas in Sydney, with one shed on each farm affected. Deaths ranged from 120 to 200 birds per day. Three different companies own the birds on the four farms, and no direct links between the farms are apparent.

CHLAMYDIOSIS

Chlamydiosis was confirmed by electron microscopic examination of liver sections from an aviary parrot. This adult bird had died acutely, and there was a history of deaths of young birds in the aviary. Chlamydiosis was also confirmed by immunofluorescent antibody testing on conjunctival smears of 10-week-old layer hens with conjunctivitis.

ANTHRAX

There was one confirmed and one suspected case of anthrax during the quarter. The confirmed case occurred in the Condobolin district, where cattle started dying in late March. Anthrax was confirmed by laboratory examination of peripheral blood smears. Anthrax had not been diagnosed on the property in the previous 60 years, so the diagnosis had been considered unlikely. By 26 April, 10 out of the 157 beef cattle had died. The suspect case occurred in the Wentworth district. Eight of 80 cattle died suddenly during May with haemorrhagic discharges from all orifices. They had been grazing a stubble paddock that had been part of an old stock route about 40 years ago. Laboratory examination was unable to confirm anthrax (polychrome methylene blue stains, culture and rapid immunochromatographic test on peripheral blood samples were all negative). However, the possibility of localised (e.g. intestinal) anthrax could not be ruled out in the absence of an alternative diagnosis. In both cases, NSW Agriculture policy for anthrax was applied. Properties were placed in quarantine, carcases were burnt, sites disinfected, and in-contact animals

were vaccinated. A number of movements had occurred from the former property, but there was no evidence of spread of infection.

During the quarter, there were six other investigations of sudden deaths where anthrax was excluded. Two were in sheep, where alternate diagnoses included suspect nitrate toxicity and pasteurellosis. Four were in beef cattle, where alternate diagnoses included suspect clostridial myositis and enterotoxaemia.

NEUROLOGICAL CONDITIONS IN HORSES

Two investigations during May each involved a 2-year-old Thoroughbred filly in work. There was no contact between the two horses, with one in Scone and the other in Sydney. Both had a sudden onset of neurological signs with pyrexia. One became recumbent and was euthanised. The other had abnormal gait and became blind. However, the owners continued treatment and, after two months, the animal can see again. Laboratory tests for arboviruses were negative for Ross River Virus, Murray Valley encephalitis virus, and Kunjin virus. Samples were also negative for equine herpesvirus.

Another neurological case in March involved a six-month-old Arab weanling on which the University of Sydney conducted an autopsy. Histopathological examination findings in May were reminiscent of *Neospora* spp. infection in ruminants. Material sent to Dr John Ellis of the University of Technology identified PCR product of an organism in the subfamily Toxoplasmatinae. Further work is being done to check for molecular evidence of infection by *Neospora hughesi*, a protozoal infection recently recovered from neurological cases in American horses.

BLUE–GREEN ALGAE TOXICITY (*ANABAENA CIRCINALIS*)

Twenty-two of 60 mixed-age cattle from the Narrandera district died with minimal premonitory signs. Paddock inspection showed cattle had been drinking from a low-level lagoon with dark green water. Microscopic examination of the lagoon water confirmed the presence of *Anabaena circinalis*. Histopathology showed liver lesions (periportal necrosis) consistent with peracute hepatotoxin multiorgan dysfunction, such as would occur with blue–green algae toxicity. Deaths ceased once the water source for the cattle was changed.

CATTLE TICK (*BOOPHILUS MICROPLUS*)

Eighteen cattle tick infestations were reported for the quarter, bringing the total for the year to 36. This represents a 25% reduction in the number of infestations reported for the same period last year.

Northern Territory

Contributed by:
Dick Morton
DBIRD

SALT TOXICITY IN CATTLE

More than twenty of 200 steers from the Katherine region died. They had been accidentally deprived of water for an unknown period of time, and were given access to a loose lick (the first of the season, containing 35% salt and 10% urea) prior to restoration of the water supply. Post mortem examinations were conducted on two sick animals. One animal, found in lateral recumbency, was dehydrated with an empty dry rumen. There was mucoid diarrhoea, haemorrhagic streaks along the rectal mucosa, and epicardial petechiae. The second animal was found in sternal recumbency and appeared depressed, weak and showed signs of abdominal pain. The gastrointestinal tract was full of water, and there were some pasty faeces. The history, clinical signs and post mortem findings were consistent with acute sodium chloride poisoning, with concurrent urea poisoning.

RESPIRATORY DISEASE IN HORSES

Horses on two stations in the Katherine region were examined. All had mildly elevated temperatures, dry coughs, and mucopurulent nasal discharges. Some had swollen sub-mandibular and/or pharyngeal lymph nodes. Similar symptoms were reported from a number of other stations. *Streptococcus equi zooepidemicus* was isolated from nasal swabs.

ENTEROTOXAEMIA IN GOATS

Two nanny goats died suddenly in the Katherine region. Lesions found at post mortem examination were consistent with enterotoxaemia. The herd is vaccinated with a 6-in-1 vaccine, twice yearly. *Clostridium sordei* was isolated from the small intestine. The organism has been associated with sudden death in feedlot cattle.

MAREK'S DISEASE IN CHICKENS

On a small holding in the Darwin rural area, two of 20 chickens showed depression and paralysis. Four chickens became ataxic, but recovered after a few days. Post mortem examination of the paralysed chickens confirmed Marek's Disease.

Queensland

Contributed by:
David Pitt
QDPI

TICK FEVERS AND BOVINE EPHEMERAL FEVER

Anaplasma marginale was detected in blood smears from a seven-year-old crossbred cow on a Banana shire property. She was one of two sick cows from 150, and had discoloured urine and nasal and oral discharge. A two-year-old Brahman heifer on a property in the Livingstone shire with signs of anaemia and lethargy was also positive for anaplasmosis.

Babesia bovis was diagnosed at post mortem examination as the cause of fever in two 18-month-old Santa Gertrudis steers on a property in the Banana shire. The animals were part of a group of 72 animals. Samples from six pyrexic animals showed that one was positive for bovine ephemeral fever (BEF) virus by PCR testing and three had titres to BEF virus suggestive of recent exposure. All six were negative for tick fever. The early signs of babesiosis and BEF are similar.

Bovine ephemeral fever was diagnosed by PCR test in a three-year-old cow at Dayboro, and an 18-month-old steer near Gympie in early April. A further nineteen diagnoses of BEF were confirmed by PCR testing at various locations throughout southern Queensland up until mid-June.

PESTIVIRUS

Bovine pestivirus was suspected as the cause of calf loss on a property in the Banana shire. Twelve calves died over the past 12 months and five more showed severe ill-thrift. Other cattle were in excellent condition. Bovine pestivirus was isolated from two of the five calves. Serological profiles showed that all the cows sampled were seropositive, and all the yearling heifers about to be joined were seropositive. Two persistently infected calves were running with the yearling heifers. However, only three of six 30-month-old heifers due to have their first calf were seropositive, and six recently weaned calves were seronegative. Herd records indicated a long-term problem with calf losses mostly occurring in first-calf heifers. It was suspected that replacement heifers were not developing protective pestivirus antibody levels despite contact with the persistently infected calves before joining. A vaccination program will start this year in the heifer group.

EQUINE INFECTIOUS ANAEMIA

A horse from a property in central Queensland was reluctant to walk and had a thumping heartbeat. Three horses in close contact subsequently tested positive on a Coggins test for equine infectious anaemia (EIA). The first horse died before a diagnosis could be made, but the symptoms are consistent with acute EIA. As horses infected with EIA virus that survive the initial infection become chronic carriers of the virus, the owner agreed to euthanise these horses. Biting flies spread the virus between horses mechanically. EIA is often reported along river systems in western Queensland, but is reported rarely in coastal parts of the state. The source of infection in this case was not determined. There had been no introductions to the herd from western areas. All but one neighbouring property have voluntarily tested their horses (28 in total) with negative results.

UNUSUAL OSTEOMYELITIS IN A BULL

A producer in the Banana shire noticed that a three-year-old bull had walked through a fence onto a roadway. When placed back into the paddock, the bull once again walked aimlessly through the fence and stood in the fence on the other side of the road. It appeared blind. The bull was confined to yards and treated by a veterinarian. The bull had trouble eating and drinking and had wasted significantly. It did not respond to treatment. Post mortem examination revealed severe osteomyelitis of the entire base of the skull, extending up the pituitary stalk to the brain stem. The presence of creamy pus suggested a bacterial osteomyelitis and localised encephalitis. The bull was TSE negative.

MELIOIDOSIS IN ALPACAS

Earlier in the year, 12 of 60 alpacas died due to melioidosis (see *AHSQ* Vol. 9, No. 1). In May, the deaths of five more alpacas from the same property in south Queensland were also attributed to melioidosis after post mortem examinations on several animals revealed multiple abscessation of the submandibular lymph nodes and isolation of *Burkholderia pseudomallei* from the abscesses. Lesions appear restricted to the submandibular region, with the exception of one case in which an abscess was identified in the tracheal mucosa. Blood cultures were negative. Several of the surviving alpacas have also developed abscesses. The animals are South African imports. Herd records show that abscesses have been present in the herd for a long time. The Royal Darwin Hospital is trying to determine the origin of the bacterial isolates.

BOTULISM

There have been many reports of suspected botulism from throughout central Queensland. In all cases, cattle have been in good condition. Most cases appear to be associated with protein deficiency, as many have

occurred on brigalow country with significant stands of hayed-off buffel grass and native pasture. The protein levels in this pasture are expected to be low, which would predispose cattle to pica. In one herd in the Duaringa shire, six of 170 twenty-month-old steers died. The cattle on this property are vaccinated routinely for botulism, as soils are phosphorus deficient, but these animals may have been missed. Another herd in the Banana shire lost one bull in a herd of six animals. The bull became progressively weaker, recumbent and died. The bull had flaccid paralysis of the tongue, and was unable to eat or drink. It was negative for transmissible spongiform encephalopathies (TSE) by histological examination of the brain. Ten of 3000 cattle from a property in the Peak Downs shire died, and 15 more were sick. A post mortem examination was performed on one affected animal, and it was TSE negative by histology. A diagnosis of botulism was made on clinical grounds and through elimination of other possible causes. No botulinum toxin was detected from affected animal samples.

Three separate investigations in a widespread area from Charleville to Julia Creek and south of Cunnamulla resulted in a tentative diagnosis of botulism. These cattle were not vaccinated for botulism. No detection of botulinum toxin was found in any case, but clinical signs and history were consistent with botulism.

Botulism was suspected to be the cause of the loss of 50 of 160 milking cows in a dairy herd south of Ipswich during the period from late June to early July. Contaminated feed was the suspected source of the toxin, although all feed tests were negative. At first, cattle died rapidly within a few minutes. Later in the outbreak, most of the affected cows became recumbent and died after several days, or were euthanised. Recumbent cows did not exhibit all of the expected clinical signs typically seen with botulism. Animals continued to die despite changes to the ration. Persistent deaths commonly occur with botulism outbreaks even after animals are separated from the suspected source of toxin. Samples collected at post mortem examinations were TSE negative.

POISONINGS

A three-year-old cow on a property in the Miriam Vale shire had serum lead levels of 1.2 mg/L. Two of 30 cows died, showing signs of blindness prior to death. Clinical and post mortem examination findings supported a diagnosis of lead poisoning, but the source of lead was not identified. Lead poisoning also resulted in neurological signs in a four-year-old cow near Gympie in mid-April. The cow responded to treatment with calsenate. She had access to old batteries.

In a herd of 238 cattle near Tambo, 18 died suddenly and three had diarrhoea and lethargy. The outbreak followed heavy rain and areas of white powdery scum were noted in a land depression after the water had receded. This area had been used as a dump for chemical drums. Blood samples showed moderate leucopaenia and dehydration. Histological changes to the kidney and liver were consistent with arsenic poisoning, and tissue samples contained abnormal levels of arsenic. A soil sample including some of the white powder was found to contain 25% arsenic. Arsenic poisoning also caused the deaths of two of 50 weaner cattle near Bundaberg in early April. A kidney sample contained 8.00 mg/kg FW arsenic and liver 4.00 mg/kg FW arsenic. The source of the arsenic was not determined.

Salt poisoning was suspected to have caused the deaths of eight 13-week-old pigs on a piggery in Wondai Shire in late May. Typical eosinophilic perivascular cuffing was seen in brain samples on histopathology. No infective agents were isolated from a brain swab.

PLANT POISONINGS

Indigofera spicata (creeping indigo) poisoning was diagnosed in horses in a Brisbane suburb. This may be the first Australian report of this syndrome, which has previously only been reported in Florida, USA. The plant constituted 20–30% of the pasture available, and was closely entwined with couch grass. The horses appeared to be eating it readily and had been on the pasture for several weeks before the onset of symptoms. Three ponies had severe incoordination, stomatitis and depression or somnolence. Two were destroyed. The syndrome is identical to Birdsville horse disease (*Indigofera linnaei* toxicity). Indospicine, a nitrotoxin in Indigofera plants, is the suspected cause of both syndromes. No effective therapy is available. Affected horses should be removed from infested pastures and treated symptomatically. Euthanasia is required in severe cases, but mild cases may recover fully. Clinical signs include inappetence, lethargy, decreased body weight and progressive incoordination. There may be bilateral ocular discharge, stomatitis, abortion and roaring in recovered horses.

A horse from far western Queensland had post mortem changes consistent with chronic exposure to Birdsville Indigo (*Indigofera* spp). The horse was donated for a demonstration of post mortem examination techniques at the Remote Area Animal Disease Investigation Workshop in Birdsville. He was a poor doer, dragged his hind toes, and was ataxic in the hindquarters and was no longer considered to be a safe horse for mustering. Liver changes included swollen hepatocytes and inflammatory cell infiltrates. There were also degenerative changes in the spinal cord consistent with chronic exposure to the plant. Over the last two years,

six other horses have died after or while grazing in the same paddock.

A cow on a property in the Calliope shire began showing aggression. It separated from the mob, came up to the homestead and chased people. There were skin lesions consistent with photosensitisation, and at post mortem examination there were signs of severe liver disease (swollen liver and severe jaundice of the carcass). In addition, histological examination of brain samples showed lesions consistent with hepatic encephalopathy. The cow had recently arrived from another property where she is thought to have eaten lantana. Lantana poisoning causes severe liver damage and photosensitisation. The cow was negative for TSE.

INTERNAL PARASITES

Lungworm was diagnosed in introduced six-month-old Braford cattle in north Queensland showing weakness and poor condition. Twenty-five from 150 on the property were sick. Clinical examination of one showed an increased respiratory rate and a fever. Haematology showed reduced haemoglobin concentration, packed cell volume and red cell count. A blood film showed erythrocytes with anisocytosis and Howell–Jolly bodies. Samples were negative to bovine ephemeral fever, leptospirosis (*L. pomona* and *L. hardjo*) and mucosal disease tests. The Baermann technique for lungworm larvae showed *Dictyocaulus viviparous* with 4 larvae per gram. The strongyle-type egg per gram (epg) count was 3960. There was insufficient sample for larval culture.

There were multiple reports of internal parasitism in goats this quarter. Helminthiasis due to *Trichostrongylus colubriformis* was the likely cause of the deaths of 22 of 70 goats near Boonah in mid-April. A post mortem examination was performed on one animal. It had faecal egg counts of 4500 epg, 7980 adult worms in the small intestine, and 200 adult worms in the abomasum. A property in the Banana shire lost two of 70 four-year-old Angora goats. At post mortem examination, one goat had a faecal strongyle-type epg count of 8000. One of 50 three-month-old goats from a property in the Livingstone Shire died, and three more were sick. The faecal epg count was 2500 for strongyle-type eggs, and 100 for *Trichuris* spp. A dairy goat operation in the Pioneer Shire had a goat with a faecal egg count of 3150 epg, cultured as *Trichostrongylus* spp. These worms may have been resistant to moxidectin (an anthelmintic from the macrolytic lactone family).

POULTRY

Fowl cholera (*Pasturella multicida*) was diagnosed in a small layer flock near Bundaberg in mid-May. Affected birds were found dead or paralysed, and 100 of 250 birds died

Infectious avian laryngotracheitis (ILT) was detected in a backyard layer flock when four of 40 birds died in the Sunshine Coast hinterland in mid-April. ILT was also diagnosed in a backyard flock near Nanango in mid-May, where 50 of 200 birds died. Both flocks were quarantined and vaccinated for ILT. After the cessation of clinical signs both flocks were released from quarantine.

Vitamin B2 deficiency was suspected to have caused the deaths in mid-May of 1000 of 10 000 three-week-old chickens. Affected birds had difficulty in walking and muscle tremors.

Thirty of 40 birds died over several months, and three more were sick, in a flock in the Bowen area. An emaciated bantam hen was submitted for post mortem examination. It was covered in lice (*Menopon gallinae*). There were numerous generalized neoplastic lymphoid tumours characterized by both aggregate and diffuse infiltration of large numbers of pleomorphic lymphomatous cells, including occasional large darkly stained monocytoid cells that are characteristically seen in Marek's disease. Marek's disease was also seen on a Townsville property where two of 30 birds died. The bird submitted for post mortem examination was a 7-week-old bantam in fair condition, with legs that appeared paralysed. The sciatic nerves were mildly thickened. Scattered foci of lymphocytic infiltration were seen in both nerves.

'Runting and stunting syndrome' was suspected in a small backyard flock on a Thuringowa property in north Queensland. The meat bird had poor feather development, de-pigmented legs, bright eyes with no discharge and no nervous signs. Viscera, liver and muscle were pale. The gastrointestinal tract had no gross lesions, and plenty of ingesta was present. The heads of the femurs came away with minimal effort. The gross pathological signs were consistent with 'runting and stunting syndrome'. No specific cause for this syndrome has been identified.

South Australia

Contributed by:
John Weaver
PIRSA

PASTEURELLOSIS IN ADULT EWES

A property near Wudinna, on the Eyre Peninsula recently experienced a severe outbreak of pneumonia in a flock of 220 adult ewes (between 2 and 5 years old). Eight deaths occurred while the flock had been on unimproved scrub and native grass pasture. No veterinary investigation was undertaken, as deaths ceased when the flock was moved onto a stubble

paddock. The ewes were in good condition, had been vaccinated annually with a 3-in-1 product and had been drenched 6 months earlier with an avermectin. Approximately 6 weeks later, the flock was moved again. The following day, 50 ewes were found dead, and other ewes were unable to stand, with head shaking and had copious mucoid nasal discharges. Two of the affected ewes were autopsied the next day. Gross abnormalities in the lungs indicated pneumonia. Laboratory cultures revealed heavy growth of both *Pastuerella* and *Arcanobacterium (Actinomyces) pyogenes*. Histopathology showed a marked intra-alveolar suppurative pneumonia. As the remaining affected ewes appeared to recover uneventfully, the producer decided not to treat the sheep. This outbreak was unusual, as pasteurellosis in sheep is more typically associated with outbreaks in young housed sheep. Outbreaks in extensively grazed sheep often have a slower spread and a lower mortality rate. In this case, however, the outbreak occurred very quickly, the mortality was high (20%), and there was a rapid recovery without antibiotic therapy.

ARTHRITIS IN LAMBS AT NARACOORTE

Septicaemia, pyrexia, lameness and deaths were observed in a flock of first cross ewes (3 to 4 years old) with three week old lambs on a property at Naracoorte in May and June. The problem had been occurring for a number of years; previously, rams have also died. This time, both ewes and lambs had pyrexia and arthritis. The lambs were several weeks old and had not yet been castrated when they became ill. Carpal joint aspirations were submitted for culture, and a lamb was submitted to the laboratory for post mortem examination. Neither bacteria nor neutrophils were seen in smears made from the joint fluid, and no bacteria were grown in aerobic or anaerobic culture. The post mortem examination revealed purulent arthritis, but there were no significant lesions in tissues submitted for histopathology. Erysipelas polyarthritis was considered the most likely diagnosis. It is possible that the ewes also suffered from erysipelas arthritis, given the presence of gross lesions and their response to penicillin. However, no material was submitted from rams, no post mortem examinations were conducted on adult animals, and the ewes had been vaccinated against erysipelas, perhaps with questionable efficacy. Vaccination is regarded as the only effective control for this condition. Although the organism exists in the soil, it is likely that it survives in the tonsils of the ewes, is excreted in the faeces, and is transmitted to lambs percutaneously after procedures such as mulesing or shearing. It is not clear how, or when, these lambs became infected as they had not been castrated and were several weeks old when the condition became apparent. If they had been infected in the perinatal period, clinical signs would have been expected within the first week of life. Further investigations will be undertaken on this property.

SALMONELLOSIS IN LAYER PULLETS

An investigation was undertaken into a continuing mortality problem in a flock of five-week-old layer pullets near Gawler. The birds had been dying at a low rate since arrival as day-olds, and mortality was now approaching 5%. Clinically, they showed lameness but little else. On examination of affected live birds, there was swelling of leg joints and many birds also had hypopyon (pus in the anterior chamber of the eye). At post mortem examination, most had caseated yolk sacs adherent to the abdomen wall but with no obvious navel involvement. Some had fibrin deposits on the liver and heart, and others also had pus in leg joints. *Salmonella hessarek* was cultured from joints, eyes and abdomen. The organism was sensitive to tetracyclines, and the flock responded well to water medication.

'FLOPPY BUNNY' SYNDROME

A commercial rabbit property in the Adelaide Hills experienced unexplained illness in two does, which became paralysed and required euthanasia. A third affected doe was presented for examination and was subsequently euthanised. The autopsy revealed a mottled liver and kidney, otitis externa and lung congestion. A wide range of samples was submitted to the laboratory for diagnostic evaluation. There were changes present in most tissues; in particular moderate patchy chronic interstitial nephritis, marked acute to sub-acute necrotising cardiomyopathy and mild multifocal sub-acute histiocytic and lymphoplasmacytic encephalitis. The changes in the brain and kidney were consistent with infection with *Encephalitozoon cuniculi* (a microsporidian protozoal parasite) although no organisms could be detected on gram stain. The cause of the muscle necrosis in the heart was not determined, but it was thought that nutritional factors might have contributed.

CALF SCOURS

Some beef producers in the south-east of the state have noted an increase in calf scours on their properties over recent years. This year, one property had over half of their calves develop scours (but with less than 1.4% mortalities) and on another property, about a quarter of the calves were affected, with higher mortalities (25% of affected calves). Animal health staff visited the properties and the producers were questioned about their general enterprise and management, as well as more specific information on the scouring calves. One of the properties had scours in very young calves (6 to 14 days old), and test results consistently showed rotavirus to be involved. Slightly older calves were affected on the other property, and most diagnoses involved rotavirus, with coronavirus and

cryptosporidium also present. As is often the case with calf scours, both infectious agents and management factors were contributing to the problem. Advice was given to the producers on sampling and testing, vaccination and management, and also on general extension and liaison to encourage producers to contact animal health staff.

LUPINOSIS AND AGGRESSION IN CATTLE

A property near Pt Lincoln on the Eyre Peninsula experienced several deaths in their cattle herd. The normally quiet cows were extremely aggressive prior to death. Initially the animals had difficulties standing, were staggering and would charge anyone who approached. The previous owner of this property had experienced problems with lupinosis in his sheep flock. Cattle had been introduced by the new owner and were grazing lupin stubbles. An affected heifer was euthanised. Post mortem examination revealed generalised icterus and a liver that was normal in colour and texture, but severely atrophied. Histopathology revealed massive bile duct hyperplasia and fibrosis, with only isolated clusters of hepatocytes remaining. The heifer was not eligible for bovine spongiform encephalopathy (BSE) testing, as it was only six months old. The histological changes were consistent with toxicosis associated with phomopsin, confirming a diagnosis of lupinosis.

INVESTIGATION OF A POTENTIAL ANTHRAX OUTBREAK

A property near Parrakie experienced deaths in seven-month-old steers. Veterinary assistance was requested when, two weeks after the first death, two more steers were found dead with blood coming from the eyes and mouth. The animals were found at the site where the last bale of hay had been fed. The property had experienced a botulism outbreak several years previously, with large numbers of stock lost. No vaccinations were used routinely. The most recent stock introductions had been seventy dairy heifers, six months previously. There was very little pasture available in the paddocks, and no significant weeds. The herd was being fed silage and hay, and grazed a lucerne paddock for 1.5 hours per day. Other cows and calves in the herd appeared in good condition. As anthrax was suspected, an autopsy was not performed. An ear was taken from each animal and peripheral blood smears made. Additional samples from the most recent case were also collected. Samples of feed, hay and soil were taken from where the animals had been found. Differential diagnoses considered included anthrax, clostridial diseases and bloat. No evidence of *Bacillus anthracis* was detected on the smear or from culture. The likely cause of the deaths was considered to be bloat from the lush lucerne.

Tasmania

Contributed by:
John Elliott
DPIWE, Tasmania

LABORATORY ACCESSIONS AND NOTIFIABLE DISEASES

During the quarter, there were 100 aquaculture accessions, 555 livestock accessions, 44 companion animal accessions, 66 wildlife accessions, and 12 accessions from other sources.

The following investigations into possible cases of notifiable diseases were undertaken during the quarter:

Disease	Investigations	
	+ve	No.
American Foul Brood	5	7
Avian influenza	0	1
Avian psittacosis	0	3
Bovine tuberculosis	0	17
Brucella ovis	1	27
Clinical salmonellosis	5	72
Enzootic bovine leucosis	0	5
Equine herpesvirus 1	0	1
Foot-and-mouth disease	0	2
Leptospira hardjo	2	16
Leptospira pomona	0	16
Macrocyclic lactone anthelmintic resistance	1	1
Marine aeromonad disease	0	52
Negative finfish bacteriology*	0	45
Newcastle disease	0	1
Perkinsosis of shellfish	0	2
Salmonella Pullorum	0	8
Q fever	0	1
Salmonella Abortusequi	0	1
Salmonella Abortusovis	0	7
Salmonella Enteritidis	0	10
Transmissable spongiform encepha-lopathy	0	4
Verotoxic *Escherichia coli*	0	55

**Aeromonas salmonicida* subsp. *Salmonicida,* goldfish ulcer disease, streptococcosis of salmonids

SALMONELLA MISSISSIPI IN SHEEP

Six of 1350 Merino weaners died in one week. Some scouring was seen. One carcase was submitted for post mortem examination. The carcase appeared to be toxaemic, but was otherwise unremarkable. *Salmonella* spp. were isolated from the gut, liver and lung. The Salmonella Reference Laboratory identified these as *Salmonella* Mississippi, the most common serovar isolated from human cases of salmonellosis in Tasmania. In 2001, it comprised 59% of all isolates. It is rarely reported in other States or Territories, and is an unusual finding in sheep.

DEATHS IN CALVES

A group of 67 six-month-old Friesian calves were drenched, given copper and vitamin B12 injection, and moved to a new paddock. Two days later, three calves were found dead, one was recumbent, and two others were ataxic and may have had impaired vision. Laboratory examination showed elevated liver enzymes, and multifocal myofibral hypertrophy and necrosis in the heart. Two months later, the surviving calves were put back in the paddock. Twenty-four hours later, two calves showed signs similar to those seen in the earlier cases. One live calf was submitted for laboratory examination. Multifocal erosions were found in the omasum, abomasum and colon, and myocardial necrosis also was seen. The association of the condition with grazing a particular paddock suggests a toxic cause. Necrosis of the omasum, rumen and reticulum with nervous signs (aimless wandering, incoordination), collapse and death has been seen in cattle 24–48 hours after exposure to toxic kikuyu pasture in New South Wales, Western Australia and New Zealand. Kikuyu poisoning is suspected to be due to fungal toxins rather than to the grass itself. Kikuyu does grow in Tasmania but it is not a common pasture species.

VISCERAL BLACKLEG

Two of 40 young rams died suddenly. The rams had been fed a grain supplement. Post mortem examination findings were consistent with clostridial disease. There were multiple necrotic patches in the caecal wall associated with local peritoneal adhesions. The rumen and abomasum contained considerable quantities of oats, and some peas. These gross findings resembled 'red gut' syndrome. In this condition, an excess of fermentable products is produced in the rumen, and some pass into the intestine. These can be metabolised in the caecum or colon and may damage the caecal wall. Histopathology of the intestinal wall showed a severe suppurative enteritis and necrosis. Large numbers of spore-forming bacillary bacteria were seen, and *Clostridium chauvoei* was cultured. Tissue damage is a common factor in the development of blackleg. It is likely that the acidotic conditions in the bowel favoured the growth of clostridia and damaged the tissues, allowing clostridial invasion. The rams had been vaccinated, but clostridial vaccines have poor antigenicity in sheep.

SEAGULL DEATHS

Two carcases were examined from a group of 12 dead silver gulls found in the Tamar River near Launceston. Unnatural foodstuffs in the intestines of both birds indicated that they had been feeding on the nearby refuse disposal site. Significant pathological changes were seen in the liver and gut of both birds. The death of a relatively large number of birds is suggestive of poisoning, and exposure to an unknown poison discarded on the tip is possible.

Victoria

Contributed by:
Tristan Jubb
DPI, Victoria

A large number of disease reports were received from across the state this quarter. This is probably related to the improved feed conditions and value of farmed animals as many regions slowly recover from the drought.

CATTLE

Pestivirus was diagnosed as a cause of reproductive wastage and ill-thrift in young beef cattle in north-east Victoria. *Neospora* sp. and *Salmonella* Bovismorbificans caused small abortion outbreaks in dairy cattle in south-west Victoria. *Salmonella* Dublin caused small outbreaks of diarrhoea in dairy herds in northern Victoria. Ryegrass staggers was diagnosed as the cause of mild, temporary ataxia in two beef herds in northern Victoria. There were small outbreaks (total of seven deaths) of acute bovine liver disease in two beef herds in east Gippsland. Grass tetany caused single deaths in a small number of beef herds in north-east Victoria in June. Blackleg killed unvaccinated weaned beef calves in south-west Victoria. Neonatal calves in south-west Victoria had *Escherichia coli* septicaemia, and meningitis due to *Streptococcus sanguis*.

SHEEP

Electron microscopy examination confirmed contagious ecthyma (scabby mouth) in a flock of lambs participating in a nutritional study at a research institute. Heliotrope poisoning was widespread across the north of the state, and its subclinical form was occasionally complicated by phytogenous copper poisoning and pregnancy toxaemia. There were three outbreaks of sudden death in young sheep in different regions attributed to phalaris poisoning. In one flock, 50 of 500 weaned lambs died overnight and 15 showed neurological signs after being moved onto a phalaris-dominant pasture. There were many reports of scouring and ill-thrift attributed to worms and bacterial enteritis (mostly yersiniosis). There were also reports of pregnancy toxaemia, hypocalcaemia, polioencephalomalacia, mastitis, acute fascioliasis, black disease, and facial eczema. In addition, there was a large outbreak of urolithiasis in grain-fed Merino wethers.

PIGS

Erysipelas and salmonellosis were diagnosed at post mortem examination in separate small commercial piggeries. Hypomyelinogenesis of unknown aetiology was seen on histopathological examination of tissues from young pigs that were negative for porcine circovirus. Polioencephalomyelitis, probably caused by an enterovirus, was seen with sporadic occurrences of neurological disease in young pigs in a large piggery, and no evidence for tuberculosis was found in a pig condemned at an abattoir.

ALPACAS AND GOATS

Listeriosis killed one highly valued alpaca being fed silage. In another herd, indigestion with ulcers and small granulomas of the gums were attributed to deep-penetrating grass seed injuries acquired from purchased hay. Focal symmetrical encephalomalacia caused blindness and deaths in small herd of Boer goats.

POULTRY

Riemerella anatipestifer, Marek's disease, fowlpox, infectious laryngotracheitis, stickfast fleas and *Salmonella* Typhimurium caused illness and deaths in poultry (mostly backyard flocks) around the state. All the flocks were screened for avian influenza and Newcastle disease viruses, serologically and by virus isolation, with negative results.

HORSES

Twelve equine abortions were studied. Equine herpes virus abortion detected in one case, 10 were caused by ascending opportunistic commensal bacterial infections, and two had an undetermined cause. Eight of 12 horses on one hobby farm had ulcerative skin lesions on the lip margins. They were examined for a number of viruses, including vesicular stomatitis virus, with negative results.

FISH

Two fish kills affecting perch and carp species in separate river systems were investigated. Osmotic stress was the probable cause of the carp deaths, but the cause of the perch kill was undetermined.

Western Australia

Contributed by:
Richard Norris
Department of Agriculture – WA

SURVEILLANCE ACTIVITIES

Laboratory testing was conducted on 417 investigations of animal disease during the quarter. Of these, 79 were cost-recovery (private benefit) cases, and 337 were charge-exempt (public benefit, and therefore funded directly by the Government). There was one exotic disease alert, and eight notifiable disease reports during the quarter. Ninety significant disease outbreaks with mortality or morbidity greater than 10 per cent were investigated.

NOTIFIABLE DISEASES

Four category C (discretionary quarantine) and four category A (mandatory quarantine) notifiable diseases were reported during the quarter. There were four additional cases of ovine Johne's disease diagnosed, one case of echinococcosis (hydatid disease) and three cases of malignant catarrhal fever (sheep-associated).

EXOTIC DISEASE ALERTS

The one case was a category 1 alert (low index of suspicion). It involved an investigation of suspect Newcastle disease with negative results, on a property near Perth with low egg production and poor shell quality.

DISEASES OF SIGNIFICANCE

During the period, significant disease outbreaks were investigated in 43 ovine and 30 bovine submissions. Presenting syndromes included diarrhoea, ill-thrift, nervous signs, sudden death, and weakness.

BACKLINE NECROSIS IN SHEEP

This name refers to a full depth necrotic dermatitis that occurs along the back of some 'off shears' sheep during the hot summer months, usually February. In many cases, it is associated with pour-on treatment for lice. Losses of 120 of 3400 sheep and 40 of 200 sheep at Esperance were described previously (see *AHSQ* Vol. 9 No. 1). Further investigation has revealed that milder lesions occurred in another mob that was shorn but not treated. Other reports describe deaths of 100 of 850 sheep on another farm at Esperance and 50 of 460 at Merredin (ambient temperature was 43 ºC). In another case at Karlgarin, lesions appeared on shorn sheep in the two-week period before the flock was brought back for dipping. In that case, there were seven severely affected sheep, and another 200 of the 645 had milder lesions. There is still much to be learnt about this condition, but it seems that returning freshly

shorn sheep to shadeless paddocks during hot weather may be inviting trouble.

MYCOTIC DERMATITIS IN SHEEP

Dermatophilosis resulted in heavy losses (80 of 263 sheep) in a small flock of Merino ewes at Tambellup, with the remainder of the flock being affected to some degree. Histopathological examination and bacterial culture confirmed the diagnosis.

PLANT TOXICITY IN SHEEP

Plant toxicity caused both clinical and subclinical disease in many flocks. Lupinosis continued to cause significant losses (250 of 920 weaner sheep at Kojonup, 50 of 4000 Merino ewe weaners at McAlinden, and 15 of 380 weaners with an associated myopathy at Northampton). Losses to caltrop toxicity occurred at Dowerin (4 of 390 dead) and Moonyoonooka (30 of 110 weaners dead and another 100 sick), with further unspecified losses at Moorine Rock and Mukinbudin. Oxalate toxicity, nearly always due to ingestion of slender iceplant (*Mesembryanthemum nodiflorum*), was thought to have caused the death of 150 lambs and 30 of 1000 ewes at Mullewa and 17 of 190 sheep at Yelbeni. Ingestion of *Brassica* spp. (including wild radish) may have been responsible for death due to haemolytic anaemia of 3 of 25 three-year-old Damara rams at Esperance over the previous six months.

SALMONELLOSIS

Salmonellosis was thought to be responsible for the death of 20 of 960 weaners and enterocolitis in 50 of 700 ewes on a property at Kellerberrin. *S.* Typhimurium was isolated from all tissue samples taken from one of the weaners.

ARTHRITIS IN LAMBS

Escherischia coli and *Histophilus ovis* were implicated in an unusual case of arthritis in lambs at Jerramungup. Six of 950 lambs in the flock were affected. Others in the flock also were suffering from diarrhoea. Culture of the affected joints yielded *E. coli* from one weaner and *H. ovis* from another.

NUTRITIONAL MYOPATHY IN SHEEP

Nutritional myopathy was implicated in the death of about 100 Merino weaners on oat and lupin stubble at Narrogin and 20 of 250 weaners at Wickepin. Plasma vitamin E concentrations of 0.21 mg/L in one of the Wickepin weaners were well below the normal reference range. Additional cases were reported from Wagin and Wongan Hills, where 3 hoggets died and a further 15 of 700 were clinically affected (plasma vitamin E was low at 0.13 mg/L). At least 2000 IU of vitamin E is required to effectively treat the condition. Many 'recommended' treatments deliver as little as 150 IU.

GLASSER'S DISEASE

The re-emergence of some well-described but uncommon pig diseases has been associated with the introduction of stock-rearing shelters. Outbreaks are usually closely linked to management practices. Glasser's disease was diagnosed in a four-week-old piglet at Northam, with *Haemophilus parasuis* being isolated from the lung and peritoneal fluid. Epicarditis, pleuritis, peritonitis and choroiditis were evident on histopathological examination.

PLANT TOXICITY IN CATTLE

In one case at Wagin, two heifers died and another 38 of 118 were pot-bellied, rough-coated and stunted. Post mortem examination of one heifer revealed massive liver cirrhosis consistent with lupinosis. Pyrrolizidine alkaloid and aflatoxin intoxications were considered as differential diagnoses. Five cattle at Esperance died within two days of moving to a paddock containing zamia palm. Histopathological examination of the liver of one animal revealed lesions consistent with zamia palm toxicity.

VIRAL INFECTIONS IN CATTLE

Pestivirus infection is widespread amongst Western Australian cattle, but clinical disease is not always present. In one case at Moora, several heifers from one consignment developed sub-mandibular oedema and depression. Histological examination of tissues from one heifer revealed severe and generalised nephropathy and hepatic fibrosis. The heifer tested positive for pestivirus antigen. Immunosuppression secondary to the pestivirus infection may have predisposed the heifer to a wide range of diseases although in this instance, the renal lesion was attributed to a toxic plant such as *Isotropis* spp. In another case at Yelverton, extensive perivascular cuffs of mononuclear cells were detected in the brain of an adult cow suffering from weight loss, ataxia and recumbency. The lesions were consistent with infection by bovine pestivirus or bovine herpesvirus. Malignant catarrhal fever was diagnosed in a heifer at Mt Barker that was suffering from ataxia, hyperaesthesia and pyrexia. The animal was positive by PCR for ovine herpesvirus-2 antigen, and had lymphocytic infiltrates in the portal zones of the liver and around the arcuate vessels in the renal medulla.

ANNUAL RYEGRASS TOXICITY IN HORSES

Reports of cases of annual ryegrass toxicity have been less frequent this year (perhaps due to recent dry seasons) but in one report three of eight horses died near Kelmscott after being fed meadow hay produced at Meckering. The hay contained 2796 bacterial galls/ kg. The faeces of one of the horses tested positive for bacterial galls the day before it died.

Quarterly Disease Statistics

Quarterly disease statistics — Control activities

JOHNE'S DISEASE

Johne's disease (JD) occurs primarily in dairy cattle and sheep in Australia, and to a lesser extent in beef cattle, goats, deer and camelids. Infection with sheep strains occurs to varying extents across the sheep producing regions of southern Australia but has not been detected in Queensland. Cattle strains are endemic in south-eastern Australia but surveillance programs have not identified endemic infection in Queensland, Western Australia and Northern Territory, and active measures are taken to stamp-out any incursions. Table 1 shows the number of herds and flocks known to be infected. New approaches to controlling JD, based on risk assessment and management, have been developed. Market Assurance Programs (MAPs) are in operation for cattle, sheep, goats and alpaca, with the number of herds or flocks that have reached a status of Monitored Negative 1 (MN1) or higher shown in Table 2.

Information about components of the National JD Control Program can be obtained from State coordinators and Animal Health Australia's JD coordinator, David Kennedy 02 6365 6016. Lists of beef, dairy and alpaca herds and sheep flocks assessed in the Market Assurance Programs are available on the internet (at www.aahc.com.au/jdmap).

Table 1: Herds/flocks with JD at 30 June 2004

	Cattle	Sheep	Goats	Deer	Alpaca	Total
NSW	132	335	10	1	0	478
NT	0	0	0	0	0	0
QLD	0	0	0	0	0	0
SA	53	57	3	2	0	115
TAS	24	45	6	0	0	75
VIC	1119	204	7	7	2	1339
WA	0	18	0	0	0	18
AUS	1328	659	26	10	2	2025

* Individual properties infected with JD in sheep are no longer reported in high prevalence regions of NSW.

Table 2: Herds/flocks with a JDMAP status of at least MN1/TN1 status at 30 June 2004

	Cattle	Sheep	Goat	Alpaca	Total
NSW	780	432	63	97	1372
NT#	0	0	0	0	0
QLD#	0	4	0	0	4
SA	289	247	17	37	590
TAS	113	33	1	1	148
VIC	324	106	2	29	461
WA#	0	0	0	0	0
AUS	1506	822	83	164	2575

#Herds/flocks in Free or Protected Zones are equivalent to status of MN1 or better because of the zone's status.

ENZOOTIC BOVINE LEUCOSIS

Enzootic bovine leucosis (EBL) accreditation programs have been operating in the dairy industries in Queensland and NSW for several years. Victoria, South Australia, Western Australia and Tasmania are undertaking a program of bulk milk testing of all dairy herds. Table 3 shows the number of dairy herds tested free of EBL at the end of the quarter.

Table 3: Dairy herds tested free of enzootic bovine leucosis at 30 June 2004

	NSW	NT	QLD	SA	TAS	VIC	WA	AUS
Free	1200	0	959	453	564	6277	360	9 813
Herds	1214	0	966	453	564	6340	360	9 897

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 4 shows the number of accredited flocks at the end of the quarter.

Table 4: Ovine brucellosis accredited-free flocks at 30 June 2004

NSW	NT	QLD	SA	TAS	VIC	WA	AUS
749	0	0	490	85	502	138	1964

Quarterly disease statistics — laboratory testing

The results of serological testing for a range of viral diseases from routine laboratory submissions for the quarter are shown in Table 5.

Table 5: Serological testing from routine submissions to State and Territory laboratories

	Akabane		Bluetongue		Bovine ephemeral fever		Enzootic bovine leucosis		Equine infectious anaemia		Equine viral arteritis	
	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve
Jan–Mar 03	6239	725	7045	487	1526	421	851	0	561	8	504	11
Apr–Jun 03	2854	724	6307	445	1499	354	2696	8	790	0	376	26
Jul–Sep 03	11778	749	15560	278	1901	300	9559	16	806	2	246	11
Oct–Dec 03	9689	542	7550	318	1746	289	4742	0	547	5	411	24
Jan–Mar 04	9370	529	10351	144	1349	287	7618	6	957	10	630	22
NSW	353	168	930	9	691	157	162	0	408	0	297	16
NT	0	0	0	0	0	0	0	0	0	0	0	0
QLD	794	293	263	58	249	70	1185	0	229	6	1	0
SA	156	0	179	0	58	2	1755	0	0	0	0	0
TAS	0	0	1	0	0	0	10	0	0	0	0	0
VIC	95	0	282	0	152	0	5	0	127	0	100	1
WA	7972	68	8696	77	199	58	4501	6	193	4	232	5

Quarterly disease statistics — surveillance activities

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. A total of 181 abortion investigations were performed during the reporting period — all with negative results for bovine brucellosis, as shown in Table 6.

Table 6: Surveillance for bovine brucellosis

	Abortion investigations		Test for other reasons	
	Tests	+ve	Tests	+ve
Apr–Jun 03	157	0	1728	0
Jul–Sep 03	131	0	2114	0
Oct–Dec 03	181	0	4161	0
Jan–Mar 04	294	0	714	0
Apr–Jun 04	231	0	1876	0
NSW	0	0	119	0
NT	0	0	0	0
QLD	99	0	1504	0
SA	0	0	8	0
TAS	3	0	3	0
VIC	2	0	1	0
WA	127	0	241	0

TUBERCULOSIS

Australia was declared a Free Area for bovine tuberculosis (TB) on 31 December 1997. The National Granuloma Submission Program is the major surveillance tool for TB. Table 7 summarises results from the program.

Table 7: Results of the National Granuloma Submission Program

	Granulomas submitted	TB +ve
Apr–Jun 03	1300	0
Jul–Sep 03	1750	0
Oct–Dec 03	1676	0
Jan–Mar 04	1189	0
Apr–Jun 04	1183	0
NSW	65	0
NT	0	0
QLD	900	0
SA	64	0
TAS	17	0
VIC	50	0
WA	87	0

NORTHERN AUSTRALIA QUARANTINE STRATEGY

In recognition of the special quarantine risks associated with Australia's sparsely populated northern coastline, AQIS 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 human health. NAQS surveillance activities include both offshore and onshore components. Tables 8 and 9 summarise NAQS activity in Australia over the past five quarters.

Contact: David Banks, Biosecurity Australia, DAFF

Table 8: Summary of recent NAQS activity in Australia

	Apr–Jun 03		Jul–Sep 03		Oct–Dec 03		Jan–Mar 04		Apr–Jun 04	
	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve
Aujeszky's disease	53	0	235	0	34	0	71	0	92	0
Classical swine fever	53	0	235	0	34	0	71	0	92	0
Japanese encephalitis	362	17	169	0	197	0	394	16	173	0
Nipah virus	76	0	192	0	28	0	53	0	76	0
Porcine reproductive and respiratory syndrome	53	0	235	0	34	0	71	0	92	0
Surra	182	0	175	0	45	0	127	0	112	0

In 1995–97, animals at sentinel sites on islands in the Torres Strait, but not the Australian mainland, seroconverted to Japanese encephalitis during the latter part of the wet season (March–April). In March 1998, seroconversions occurred at a number of sites on islands in the Torres Strait, and for the first time on the mainland at the tip of Cape York Peninsula. Sentinel pigs at Badu Island have seroconverted each wet season since then (except for 1999), and seroconversions have been detected on other central Torres Strait islands in surveys. Positive results were also detected at one sentinel pig site on the tip of Cape York Peninsula in February 2004.

PORTS SURVEILLANCE PROGRAM

Biosecurity Australia conducts the Ports Surveillance Program for *Culicoides*, screw-worm fly, exotic bees and bee mites. Seaports, particularly those servicing returning livestock vessels and those dealing with high risk deck cargo such as timber, mining equipment and containers, are considered to be high risk locations for incursions of such pests. The program increases the capacity to detect any incursions at an early stage, and this in turn increases the probability of a successful eradication program. The *Culicoides* surveillance also supports the livestock export trade by confirming the continuous or seasonal absence of *Culicoides* vectors at ports from which livestock are loaded. Table 9 shows the number of times that insect trap sites were inspected for the Port Surveillance Program — no exotic insects or mites were detected.

Contact: David Banks, Biosecurity Australia, DAFF

Table 9: Number of inspections of insect trap sites

	Apr–Jun 03	Jul–Sep 03	Oct–Dec 03	Jan–Mar 04	Apr–Jun 04
Port surveillance					
Asian bees	12	15	10	12	15
Bee mites	30	15	14	20	25
Culicoides	32	31	32	29	32
Screw-worm fly	38	31	31	30	28
NAQS					
Screw-worm fly	108	108	108	108	36

SALMONELLA SURVEILLANCE

The National Enteric Pathogen Surveillance Scheme (NEPSS) is operated and maintained on behalf of the Commonwealth and States/Territories by the Microbiological Diagnostic Unit at the University of Melbourne. Data on isolates of salmonellae and other pathogens are submitted to NEPSS from participating laboratories around Australia. Quarterly newsletters and annual reports of both human and non-human isolates are published, and detailed data searches are provided on request to NEPSS. Table 10 summarises *Salmonella* isolations from animals notified to NEPSS for the quarter.

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

Table 10: Salmonella notifications, 1 January to 31 March 2004

Serovars	avian	bovine	canine	equine	feline	ovine	porcine	other	Total
S. Bovismorbificans	0	30	0	0	1	0	0	0	31
S. Dublin	0	30	1	0	1	0	0	0	32
S. Infantis	0	0	4	0	0	0	0	0	4
S. Typhimurium	11	46	5	4	4	8	1	3	82
Other	3	12	8	4	3	1	4	22	57
Total	14	118	18	8	9	9	5	25	206

ZOONOSES

The National Notifiable Diseases Surveillance System (NNDSS) of the Communicable Diseases Network Australia collects statistics about many human diseases. A summary of information about five important zoonoses is submitted to NAHIS each quarter (see Table 11).

Contact: Communicable Diseases Intelligence, Australian Government Department of Health and Ageing (Internet address: http://www.cda.gov.au/pubs/cdipubs.htm)

Table 11: Notifications of zoonotic diseases in humans

Disease	Q2-03	Q3-03	Q4-03	Q1-04	Q2-04	Current quarter							
					AUST	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
Brucellosis[#]	8	5	3	3	6	0	2	0	2	0	0	2	0
Leptospirosis	49	21	27	53	58	0	4	1	53	0	0	0	0
Listeriosis	18	12	18	17	19	0	12	0	3	1	0	2	1
Ornithosis	35	79	64	68	65	0	15	0	0[nn]	2	0	48	0
Q fever	129	96	123	101	112	0	57	2	32	9	1	7	4

nn disease is not notifiable in these States

Brucella melitensis and *Brucella abortus* are exotic to Australia.

NATIONAL TSE SURVEILLANCE PROGRAM

The National Transmissible Spongiform Encephalopathies Surveillance Program (NTSESP) is an integrated national program jointly funded by industry and governments to demonstrate Australia's ongoing freedom from BSE and scrapie, and to provide early detection of these diseases should they occur. Table 12 summarises the activity of the program over the past five quarters. All specimens tested were negative for TSEs. Information about NTSESP is available on the internet (at www.aahc.com.au/surveillance/ntsesp).

Contact: Chris Baldock, Animal Health Australia's NTSESP National Coordinator

Table 12: Number of animals tested under NTSESP (All were negative for TSE)

	Apr–Jun 03		Jul–Sep 03		Oct–Dec 03		Jan–Mar 04		Apr–Jun 04	
	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep
NSW	45	18	36	44	20	48	25	38	22	26
NT	7	0	7	0	8	0	3	0	1	0
QLD	49	8	49	7	40	2	20	9	54	2
SA	8	11	5	14	8	33	3	17	10	16
TAS	1	7	2	4	0	4	1	1	2	1
VIC	26	19	34	39	17	26	21	11	11	25
WA	1	15	15	27	8	28	10	14	11	11
AUS	137	78	148	135	101	141	83	90	111	81

NATIONAL RESIDUE SURVEY

Of 2895 samples tested during the quarter for agricultural and veterinary chemicals, anthelmintic residues were detected in samples from beef cattle and goats, an antibiotic residue was detected in a beef liver sample, and there were seven growth promotant-related detections and 42 metal residue detections. The results are summarised in Table 13.

A beef liver sample had a triclabendazole residue of 4.5 mg/kg, where the maximum residue level (MRL) for this veterinary drug in beef liver is currently 0.5mg/kg. The Australian Pesticides and Veterinary Medicines Authority has recommended a change of MRL to 2 mg/kg, but this change has not been promulgated in the Australian Food Standards Code, and the detection was above the new proposed MRL for triclabendazole. A traceback investigation is in progress. There were also three moxidectin residue detections in goats, with the highest residue level at 0.56 mg/kg. There is no MRL in goat liver, but the MRL in sheep liver is 0.05mg/kg. As moxidectin is not registered for use in goats, the residues resulted from extra-label use of the product. The antibiotic residue was neomycin at 0.52 mg/

kg, and was detected in a cow. Although this exceeded the MRL of 0.5 mg/kg, a traceback investigation was not initiated, as the detection is below the residue action level (RAL). The four hormone residues were (17-alpha) 19-nortestosterone, and were found in urine samples from cattle and sheep. These levels are indicative of endogenous production, and no traceback investigations were initiated. There were also three ractopamine detections in pig urine. Ractopamine is a registered veterinary drug in Australia for growth promotion in pigs only. Urine is used, across species, as the test matrix for the general beta-agonist screen in the residue-testing program. The three ractopamine detections in pig urine were not indicative of misuse of the veterinary drug in this species.

Of the 42 metal detections found during the quarter, one was from a sheep and the remaining 41 were from minor species that have no maximum level (ML) set. The sheep detection was for cadmium (1.4mg/kg), exceeding the ML of 1.25 mg/kg, but below the RAL of 2.5 mg/kg, so no traceback investigation was initiated. As the other 41detections did not exceed an ML, no further action was taken.

Further results, reports and information on NRS can be found on the internet (at www.daff.gov.au/nrs).

Contributed by: Daryl Crapp, National Residue Survey, DAFF

Table 13: National Residue Survey, 1 April to 30 June 2004
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	1	45	0	1	0	63	0	11	0	7	0	28	0	9	1	164
pigs	0	6	0	0	0	5	0	5	0	0	0	7	0	4	0	27
sheep	0	34	0	0	0	3	0	11	0	5	0	24	0	16	0	93
other	0	25	0	0	3	15	0	13	0	0	0	11	0	6	3	70
Total	2	110	0	1	3	86	0	40	0	12	0	70	0	35	5	354
Antimicrobials																
cattle	0	95	0	1	0	120	0	28	0	22	1	63	0	9	1	338
pigs	0	28	0	0	0	28	0	19	0	1	0	39	0	9	0	124
sheep	0	96	0	0	0	6	0	34	0	6	0	45	0	43	0	230
other	0	8	0	0	0	6	0	4	0	0	0	9	0	4	0	31
Total	0	227	0	1	0	160	0	85	0	29	1	156	0	65	1	723
Growth promotants																
cattle	1	108	0	2	0	163	0	25	0	29	0	45	0	15	1	387
pigs	1	14	0	0	1	12	1	8	0	0	0	15	0	3	3	52
sheep	1	57	0	0	0	2	0	27	1	4	0	34	1	32	3	156
other	0	6	0	2	0	4	0	3	0	0	0	3	0	1	0	19
Total	3	185	0	4	1	181	1	63	1	33	0	97	1	51	7	614
Insecticides																
cattle	0	109	0	5	0	154	0	17	0	13	0	89	0	12	0	399
pigs	0	7	0	0	0	5	0	4	0	0	0	6	0	0	0	22
sheep	0	75	0	0	0	7	0	30	0	5	0	44	0	34	0	195
other	0	55	0	5	0	19	0	13	0	0	0	5	0	8	0	105
Total	0	246	0	10	0	185	0	64	0	18	0	144	0	54	0	721
Metals																
cattle	0	24	0	1	0	28	0	6	0	4	0	18	0	4	0	85
pigs	0	5	0	0	0	2	0	6	0	0	0	11	0	2	0	26
sheep	0	22	0	0	0	9	0	6	0	2	0	12	1	8	1	59
other	21	18	3	2	3	7	12	8	0	0	1	2	2	2	42	39
Total	21	69	3	3	3	46	12	26	0	6	1	43	3	16	43	209
Miscellaneous																
cattle	0	44	0	2	0	60	0	7	0	8	0	30	0	9	0	160
pigs	0	13	0	1	0	9	0	9	0	1	0	11	0	9	0	53
sheep	0	16	0	0	0	2	0	10	0	2	0	15	0	9	0	54
other	0	2	0	0	0	0	0	1	0	0	0	2	0	2	0	7
Total	0	75	0	3	0	71	0	27	0	11	0	58	0	29	0	274

AUSTRALIAN MILK RESIDUE ANALYSIS SURVEY

The Australian Milk Residue Analysis (AMRA) Survey is an independent monitoring program for agricultural, veterinary residues and environmental contaminants in raw cow's milk. The AMRA Survey is currently coordinated by Dairy Food Safety Victoria on behalf of the Australian Dairy Authorities Standards Committee (ADASC) and the Australian dairy industry. The AMRA Survey is an integral part of the Australian dairy industry efforts in securing access to major export markets, including the European Union. The samples taken in the Survey are from bulk milk farm pick-up tankers.

Table 14 summarises the results for the quarter. A single antimicrobial residue for cloxacillin (0.014 mg/kg in whole milk) was detected at a level above the Australian maximum residue limit, which is 0.01 mg/kg in whole milk. As happens with any positive sample, the relevant state dairy authority investigated the residue, and follow-up action was implemented. In this particular case, the cause could not be conclusively determined.

In the future, AMRA Survey results will be reported on an annual basis. The next report will appear in *AHSQ* Vol.10, No. 2.

For further information contact: Kelly Long (AMRA Survey Co-ordinator), Dairy Food Safety Victoria, phone (03) 9810 5900; fax (03) 9819 4299; e-mail klong@dairysafe.vic.gov.au

Table 14: Australian Milk Residue Analysis Survey, 1 April to 30 June 2004

Each pair of figures gives the number of samples above the maximum residue limit and the number of samples tested.

	NSW		NT		QLD		SA		TAS		VIC		WA		AUS	
Aflatoxins	0	1	0	0	0	1	0	2	0	1	0	8	0	0	0	13
Antimicrobials	0	21	0	0	0	11	0	15	0	12	1	114	0	4	1	177
Benzimidazoles	0	2	0	0	0	0	0	0	0	0	0	2	0	1	0	5
Levamisole	0	1	0	0	0	0	0	1	0	1	0	2	0	0	0	5
Macrocyclic Lactones	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	3
Organochlorines	0	2	0	0	0	2	0	2	0	2	0	18	0	0	0	26
Organophosphates	0	2	0	0	0	2	0	2	0	2	0	18	0	0	0	26
PCBs	0	2	0	0	0	2	0	2	0	2	0	18	0	0	0	26
Synthetic pyrethroids	0	2	0	0	0	2	0	2	0	2	0	18	0	0	0	26
Triclabendazole	0	21	0	0	0	11	0	15	0	12	0	114	0	4	0	177

SUSPECT EXOTIC OR EMERGENCY DISEASE INVESTIGATIONS

There were 23 investigations of diseases suspected to be either exotic or a possible emergency reported during the quarter, as shown in Table 15. More details about some of these investigations can be found in State reports.

Table 15: Exotic or emergency disease investigations reported from 1 April to 30 June 2004

DISEASE	SPECIES	STATE	MONTH	RESPONSE	FINDING
Anthrax	bovine	SA	Jun	2	negative
Anthrax	bovine	VIC	Apr	1	negative; 4 investigations
Anthrax	bovine	VIC	May	1	negative
Anthrax	bovine	VIC	May	2	negative
Anthrax	bovine	VIC	Jun	2	negative; 2 investigations
Australian bat lyssavirus	fauna (bat)	VIC	Apr	3	negative
Australian bat lyssavirus	canine	QLD	Jun	2	negative
Avian influenza	avian	NSW	May	3	acute pasteurellosis
Equine herpesvirus	equine	VIC	May	2	suspected botulism
Foot-and-mouth disease	bovine	NSW	May	3	negative
Foot-and-mouth disease	bovine	TAS	Apr	3	negative for FMD and bovine malignant catarrh; AGID positive for bovine pestivirus
Foot-and-mouth disease	bovine	TAS	Apr	3	negative ELISA; AGID positive for bovine pestivirus
Newcastle disease	avian	NSW	Apr	3	infectious laryngotracheitis
Newcastle disease	avian	NSW	May	2	foreign body conjunctivitis
Newcastle disease	avian	NSW	May	2	Marek's disease
Newcastle disease	avian	NSW	May	3	acute pasteurellosis
Newcastle disease	avian	QLD	Jun	3	acute pasteurellosis
Newcastle disease	avian	WA	May	1	negative
Vesicular stomatitis	equine	VIC	Apr	2	feed injury

KEY to highest level of response:

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

NAHIS contacts

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

Name	Role	Phone	Fax	e-mail
Chris **Baldock**	National NAHIS Coordinator	07 3255 1712	07 3844 5501	chris@ausvet.com.au
David **Banks**	Northern Australia Quarantine Strategy	02 6272 5444	02 6272 3399	david.banks@daff.gov.au
Chris **Bunn**	Emergency Disease Preparedness, AFFA	02 6272 5540	02 6272 3372	chris.bunn@daff.gov.au
John **Elliott**	Tas. State Coordinator	03 6336 5334	03 6336 5374	john.elliott@dpiwe.tas.gov.au
Jenny **Hutchison**	Australian Government NAHIS Coordinator	02 6272 4719	02 6272 3150	jenny.hutchison@daff.gov.au
Tristan **Jubb**	Vic. State Coordinator	03 5430 4545	03 5430 4520	tristan.jubb@dpi.vic.gov.au
David **Kennedy**	Johne's Disease Coordinator	02 6365 6016	02 6365 6088	david@ausvet.com.au
Diane **Lightfoot**	National Enteric Pathogen Surveillance Scheme	03 9344 5701	03 9344 7833	d.lightfoot@microbiology.unimelb.edu.au
Kelly **Long**	Australian Milk Residue Analysis Survey	03 9810 5900	03 9819 4299	klong@dairysafe.vic.gov.au
Angela **Merianos**	Communicable Diseases Intelligence	02 6289 1555	02 6289 7791	www.health.gov.au
Peter **Miller**	National Residue Survey	02 6272 3762	02 6272 4023	peter.miller@daff.gov.au
Barbara **Moloney**	NSW State Coordinator	02 6391 3687	02 6361 9976	barbara.moloney@agric.nsw.gov.au
Richard **Norris**	WA State Coordinator	08 9368 3637	08 9367 6248	rnorris@agric.wa.gov.au
David **Pitt**	Qld State Coordinator	07 4722 2694	074778 4307	david.pitt@dpi.qld.gov.au
Brian **Radunz**	NT State Coordinator	08 8999 2130	08 8999 2089	brian.radunz@nt.gov.au
Neville **Spencer**	National Granuloma Submission Program	02 6271 6650	02 6272 5442	neville.spencer@aqis.gov.au
John **Weaver**	SA State Coordinator	08 8207 7925	08 8207 7852	weaver.john2@saugov.sa.gov.au
Simon **Winter**	Animal Health Australia Program Manager	02 6203 3988	02 6232 5511	simon.winter@aahc.com.au
Rupert **Woods**	Australian Wildlife Health Network	02 9978 4749	02 9978 4516	rwoods@zoo.nsw.gov.au

Disease Watch Hotline — 1800 675 888

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

For information about the Disease Watch Hotline, contact Jamie Penrose, Animal Health Australia.

Animal Health Surveillance

This report was prepared for 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 this report, provided due acknowledgment is made of its source.

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