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QUARTERLY REPORT

CONTENTS

Exercise Tethys	1
OIE International Bluetongue Symposium	2
FMD vaccine bank news	3
OIE Regional Commission Conference	4
Animal Health Committee news	4
National Arbovirus Monitoring Program	5
Surveillance for antimicrobial resistance	6
Australian Wildlife Health Network	6
Aquatic animal health	8
State and Territory reports	9
Quarterly disease statistics	18
Contacts	24

Preface

Australia's preparedness to manage exotic and emergency animal disease threats continues to develop. A summary of 'Exercise Tethys', Australia's largest national aquatic animal disease simulation, is provided in this issue. Also featured is a report on the development of new arrangements and contracts to ensure an adequate supply of foot-and-mouth disease (FMD) vaccine in the event of an outbreak of the disease in Australia.

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

Exercise Tethys

Exercise Tethys, a national aquatic disease outbreak simulation, was held from 17–18 November 2003. More than 80 staff from eight government jurisdictions and three industry bodies participated in the simulation of a major disease outbreak in the silver perch aquaculture industry. The aim of the simulation was to address issues of inter-jurisdictional communication and cooperation in response to an emergency disease incident, and heighten the awareness of these jurisdictions to the potential for incursions of emergency disease in Australia's aquatic environment.

The disease chosen for the simulation was the highly infectious viral haemorrhagic septicaemia (VHS), which is listed by the OIE (World Organisation for Animal Health). The VHS virus has never been reported in Australia, but occurs in the continental part of Europe and has been associated with massive mortalities of herring along the Pacific Coast of the United States and Canada. In Western Europe, annual losses due to VHS have been estimated at US$60 million.

Industries in Australia that are susceptible to the disease are trout (rainbow, brown and brook) worth $12.8 million and salmon (Atlantic and Chinook) worth $112 million. Should VHS become established in Australia, the losses to these industries could be devastating

The simulation was a functional exercise that took place in an operational environment and required participants to perform the functions of their roles. Emergency operations centres were established, and participants met and made decisions.

The objectives of the simulation were to:

- evaluate formal communication networks between jurisdictions;

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- evaluate informal communication networks between jurisdictions;
- evaluate State and Territory control centre manuals;
- improve cooperation between jurisdictions during an emergency response;
- evaluate awareness of emergency disease management mechanisms (eg. disease control policies and strategies as described in AQUAVETPLAN, Aquatic Consultative Committee on Emergency Animal Disease operation) among States/Territories.

The simulation scenario and activity incorporated the following:

- three States had a simulated outbreak;
- other States/Territories were 'disease free' but were required to undertake necessary disease surveillance activities and participate in national-decision making and resource allocation;
- industry participation at the national and state level; and
- activation of 'virtual' State Disease Control Headquarters and the (AqCCEAD).

The simulation did not incorporate:

- physical field operations (but field operations were simulated);
- communications with other countries (these were simulated as required); or
- the establishment of Local Disease Control Centres (these were simulated as required).

The draft report on the outcomes of Exercise Tethys is being developed in consultation with the participating jurisdictions, and will be released in mid–2004.

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

OIE International Symposium on Bluetongue

The third OIE (World Organisation for Animal Health) International Symposium on Bluetongue was held in Taormina, Sicily, from 26 to 29 October 2003.

Although held as part of ongoing efforts to ensure that trade policies for bluetongue are science-based, this meeting was precipitated by the outbreaks of bluetongue disease that have occurred in southern Europe since 1998. In most of the world, bluetongue has shown only the minor annual variations in distribution expected of an arbovirus. However, in many countries of Mediterranean Europe (Italy, Greece, Turkey, the Balkans and islands belonging to Spain and France), there has been a dramatic change, with bluetongue being isolated in previously free areas or countries. Since 1998, five seroytpes of virus have been active in southern Europe. Molecular studies indicate that the virus entered the Mediterranean from two sources, moving west from Asiatic Turkey and north from Africa. It is postulated that climatic change has enable the local vector (*Culicoides imicola*) to carry the virus to northern populations of other midge species that are able to act as virus vectors, and that these, in turn, may extend viral activity further north.

Many of the papers presented at the conference focused on bluetongue vectors, reflecting the acceptance of culicoides midges as the primary host of bluetongue virus, and the critical role of vectors as the principal means of virus spread. It is now understood that bluetongue viruses are transmitted by a small number of species of midges in predictable, finite ecosystems around the world. Multiple serotypes of virus occur in each ecosystem, and these viruses have a common molecular structure or topotype. Each ecosystem has a different midge as the primary virus vector, with *C. brevitarsis* filling this role in Australia. It was suggested that viruses transported by (viraemic) animal movement to a different ecosystem cannot establish, because the viruses are not adapted to the local vectors. This is in marked contrast to traditional views, where infected animals have been regarded as chronically infected, posing a life-long risk for any importing country with *Culicoides* spp.

Participants considered that there will be an increasing requirement for monitoring and surveillance for bluetongue internationally, employing guidelines and standards proposed by an OIE expert panel. The OIE Terrestrial Animal Health Code chapter for bluetongue is to be revised. It was recommended that surveillance and monitoring guidelines not be prescriptive, and that different sources of data, both random and non-random, should be accepted. Other priority areas identified by the symposium for consideration by the OIE include standards for surveillance, buffer and free areas, vaccines and vaccination, movement from seasonally free zones and movement of antibody-positive animals.

Contributed by: Geoff Gard, Veterinary consultant, Mystery Bay. e-mail: geoffgard@dodo.com.au

Foot-and-mouth disease vaccine bank news

The need to develop new arrangements and contracts to ensure an adequate supply of foot-and-mouth disease (FMD) vaccine in the event of an outbreak of the disease in Australia was highlighted following Exercise Minotaur (Australia's largest disease simulation carried out in September 2002 — see *AHSQ* Vol. 8, No.3).

Australia has been a member of the International Vaccine Bank for foot-and-mouth disease (IVB) held at Pirbright in the United Kingdom since the IVB commenced in 1985. The IVB holds concentrated antigens of seven strains of FMD virus sufficient to produce 500 000 cattle doses of vaccine for each strain. The IVB also has a small FMD vaccine formulation plant. The Australian Quarantine and Inspection Service (AQIS) and the Australian Pesticides and Veterinary Medicines Authority (APVMA) have undertaken assessments and issued an Import Permit and an Emergency Permit, respectively, for the import and use of IVB vaccine in Australia. However, both permits include conditions restricting their use, including one that requires the slaughter of animals vaccinated with the IVB FMD vaccine.

In 2000, the Australian Government Department of Agriculture, Fisheries and Forestry (the Department) and the New Zealand Ministry of Agriculture and Fisheries jointly commissioned an independent expert report on future options for supply of FMD vaccine. The report recommended that Australia (and New Zealand) should leave the IVB and enter into a new arrangement with a commercial vaccine producer rather than continue with the current IVB, upgrade the plant, and replace the antigens.

After extensive consultation between governments and the relevant industries, the need for Australia to improve access to an adequate supply of FMD vaccine that meets current regulatory standards and agreed specifications was endorsed at the FMD/BSE Policy Forum Meeting in November 2001. The Forum tasked Animal Health Australia (AHA) to develop a business plan and to develop a tender document for commercial supply of FMD vaccine.

Specifications for an independent vaccine supply of 500 000 cattle doses of nine strains of FMD vaccine were endorsed at another AHA-convened industry-government meeting in November 2002. In addition, it was recommended that the costs of the emergency FMD vaccine arrangements be shared by industry (20%) and governments (80%). The Primary Industries Ministerial Council (PIMC) endorsed this recommendation in April 2003, with the Australian Government contribution to be 40% and the States and Territories collectively to provide 40%, with individual contributions calculated using the established Emergency Animal Disease Response Agreement formula for FMD (see www.aahc.com.au/eadp/response.htm).

AHA, in conjunction with funding contributors, has undertaken a tender process for supply of the antigens and is negotiating a supply contract with a preferred tenderer. It is anticipated that the contractual arrangements for funding and supply will be in place in early 2004.

As Australia progressed the establishment of an independent commercial supply for FMD vaccine, the Commissioners of the IVB unanimously agreed in May 2003 that the Bank would cease operations from 30 June 2004, because the IVB no longer meets the needs of its members for the supply of high quality, safe, and effective FMD vaccines. However, the Commission has initiated consultations on possible future arrangements for international cooperation with an FMD vaccine bank in which Australia, through the Office of the Chief Veterinary Officer, is participating. Again, it is envisaged that the new international bank would be provided under contract with one or more commercial suppliers to manufacture and store concentrated FMD antigen and, on request, formulate the antigen into ready-to-use vaccine.

In addition to these activities, opportunities are being explored with other FMD vaccine banks for mutual sharing arrangements. Such arrangements would expand the range of antigens and the number of doses of vaccine that could be available in the face of an outbreak.

Contributed by: Neil Tweddle, OCVO, DAFF

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.

OIE Regional Commission Conference

The OIE (World Organisation for Animal Health) supports regional cooperation through its five Regional Commissions. The Regional Commission for Asia, the Far East and Oceania held its 23rd Conference in New Caledonia in November 2003.

Two technical items were presented to the Conference. The first of these was on animal carcase disposal methods (including rendering) in animal disease outbreaks. The growing trend to question the validity of a stamping-out approach to emergency animal disease, because of negative animal welfare and environmental outcomes, was discussed. New technologies for animal carcase disposal were described and the need to create alternatives to mass animal slaughter in the future was emphasised.

The second technical item was an update on developments in aquatic animal diseases. While aquaculture has been growing rapidly in many countries in the region, there has been no matching expansion of supporting aquatic animal health infrastructure. This has resulted in lack of clarity about reporting responsibilities in some countries.

The importance of rabies in the region was recognised as a constant risk to human health where the disease exists and a potential threat to all rabies-free countries in the region. The World Health Organisation (WHO) reported that over half the estimated global number of human rabies deaths occur in Asia; most deaths follow a dog bite. The need for close cooperation between medical and veterinary sectors for effective prevention and control of human and animal rabies infection was stressed. The Commission recommended that a joint international conference be organised by OIE and WHO to establish the technical basis for the eventual official recognition and maintenance of rabies freedom in countries or zones.

A presentation was given on the Global Framework on Transboundary Animal Diseases (GF-TAD), which is a global initiative of OIE and the Food and Agriculture Organisation of the United Nations (FAO) aimed at targeting the control of major transboundary animal diseases, such as FMD, at their source.

Recommendations from the Conference will be considered by the International Committee of the OIE at the General Session in May 2004.

Contributed by: Jill Mortier, OCVO, DAFF

Animal Health Committee news

Animal Health Committee (AHC) meetings provide an opportunity for State Chief Veterinary Officers (CVOs) and the Australian Government to develop a national approach to animal health policy. AHC also considers issues arising from animal health developments in other countries. The New Zealand Chief CVO attends AHC meetings to enhance bilateral cooperation on animal health policy. AHC most recently met in October 2003 in Alice Springs, Northern Territory.

JOHNE'S DISEASE

The outline of an Assurance Based Credits (ABC) trading scheme was endorsed in principle by AHC. The Ovine Johne's Disease (OJD) Technical Advisory Group (TAG) is developing an OJD Animal Health Statement for the ABC scheme. Parameters for prevalence areas and annual surveillance requirements are to be further discussed this quarter.

AHC endorsed the protocol for a pilot trial for assurance-based trading of 'beef only' cattle to be held this quarter in northern Victoria. The audit and report of the trial will be used to progress a national ABC scheme for trade in cattle. AHC also considered progress on the development of a similar scheme for dairy cattle.

VACCINES

A number of issues were discussed, including the development of Standard Operating Procedures and guidelines for the use of foot-and-mouth disease (FMD) vaccine, options for security of supply for anthrax vaccine, and a report on emergency usage of vaccine for both endemic and exotic disease.

EMERGENCY ANIMAL DISEASE

Arrangements for implementation of a national livestock standstill in the case of an outbreak of an emergency animal disease (EAD) were discussed. Jurisdictions will report on progress to the next meeting in May 2004.

AHC is developing a discussion paper about arrangements for cost-sharing in non-infected jurisdictions during EAD outbreaks. This is a further step in the on-going elaboration of the national emergency response plan and the associated cost-sharing arrangements.

SUBCOMMITTEE ON ANIMAL HEALTH LABORATORY STANDARDS

The Subcommittee on Animal Health Laboratory

Standards (SCAHLS) has worked with Animal Health Australia to develop a funding proposal for quality assurance and professional testing for pathology laboratories as part of Australia's EAD preparedness.

AHC endorsed the program of laboratory workshops planned for 2004, including export testing, molecular diagnostics, FMD enzyme-linked immunosorbent assay (ELISA) testing, and the Australian National Quality Assurance Program (ANQAP).

AHC members are collecting information about the testing of wildlife samples within their jurisdictions, including current costs. AHC will consider the testing of wildlife samples at their next meeting in May 2004, as part of ongoing development of animal disease surveillance in Australia.

ANIMAL WELFARE WORKING GROUP

Animal welfare issues are becoming increasing significant both within Australia and internationally. The Animal Welfare Working Group (AWWG) is a subcommittee of AHC, and is responsible for developing sound science-based animal welfare standards. AWWG is currently progressing the development of a number of national welfare codes including those for pigs, the land transport of cattle, poultry, sheep and goats, and captive-bred emus. The revised national welfare code for cattle is going forward for Primary Industry Standing Committee (PISC)/Primary Industry Ministerial Council (PIMC) endorsement. AHC also contributed to the development of the draft National Animal Welfare Strategy. AWWG has prime responsibility for the implementation of PIMC layer hen housing decisions. In 2004, AHC and the AWWG will also consider welfare issues arising from animal disease emergencies. AWWG will meet in Hobart in February 2004.

Contributed by: Lyndel Post, Animal and Plant Health Policy, DAFF

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 as bluetongue, Akabane and bovine ephemeral fever (BEF) and their vectors.

This report covers the second half of 2003, when arboviral activity in northern Australia is usually low. Drought persisted across a large area of eastern Australia throughout 2003 with a late onset to autumn and a mild winter. There was an early start to the monsoonal wet season in the Northern Territory. Neither seroconversions nor vector activity were detected in the southern States of Victoria, Tasmania and South Australia in the second half of 2003.

BLUETONGUE VIRUSES

In Western Australia (WA), seropositive cattle were detected in the Kimberley and Pilbara regions in the second half of the year. In the Northern Territory (NT), BTV activity was reasonably widespread with seroconversions in four sentinel herds in the third quarter, and five in the fourth quarter. In Queensland (QLD), transmission was detected in coastal sites in the north and northeast. An unusual feature was continued transmission at Roma, suggesting that onset of low winter temperatures in southern inland areas was delayed. There were no seroconversions in New South Wales (NSW) during the period.

AKABANE VIRUS

In WA, seropositive cattle were detected in the Kimberley and Pilbara regions in the second half of the year. Activity appeared to be high in the central Pilbara region and low elsewhere, but there were no reports of disease, such as calf deformities. In the NT, activity was seen in all herds in the far north. In Qld, there was less widespread activity than the usual spring seasonal pattern with detection in the north and northeast but not the southeast. Occurrence at Roma was consistent with the finding for bluetongue virus. There were no seroconversions in New South Wales (NSW) during the period.

BOVINE EPHEMERAL FEVER VIRUS:

In WA, seropositive cattle were detected in the Kimberley and Pilbara regions, as well as at locations between those regions in the second half of the year. The prevalence was generally low. In the NT, activity was very restricted and seen only in two herds in the far north. In Qld, activity was only recorded at two sites in the far north of the State and was not detected in NSW. This overall reduction in activity is probably due to dry conditions, which have been extensive and prolonged.

INSECT TRAPPING

In WA, *Culicoides brevitarsis* was collected at a limited number of sites in the north, and numbers were low. In the NT, vectors generally followed the usual pattern.

Additional information can be found at Animal Health Australia's website (www.aahc.com.au/).

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

Surveillance for antimicrobial resistance

The report of the Joint Expert Technical Advisory Committee on Antibiotic Resistance (JETACAR) was released in September 1999 and is available from the internet at www.health.gov.au/pubs/jetacar.pdf. One of its key recommendations (Recommendation 10) addressed the issue of monitoring and surveillance.

Briefly, it was recommended that a comprehensive surveillance system be established for antimicrobial-resistant bacteria and resistance genes in humans and animals. Further, it suggested that the surveillance system should include medical (including nosocomial), food-producing animal and veterinary areas with particular emphasis on the establishment of food-chain and environmental connections. As a first step in implementing this recommendation, the Australian Government released the *Strategy for Antimicrobial Resistance (AMR) Surveillance in Australia* in September 2003 (see www.health.gov.au/pubhlth/strateg/jetacar/pdf/amrstrategy.pdf). As part of this strategy, the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) developed an action plan for antimicrobial resistance surveillance (AMR) in animals with a public health focus. A pilot surveillance program is the major element of the action plan, and a Technical Reference Group has been formed to advise on its implementation.

The DAFF-funded pilot program began in November 2003 and will run until July 2004. The focus is on those livestock species where antimicrobials are used extensively in feed or water, and on commensal/indicator organisms that have the potential to be transmitted from animals to humans through the food chain. Caecal samples are being collected from abattoirs in Queensland, New South Wales, Victoria and South Australia. Ten beef and seven pig slaughter establishments have been chosen, based on levels of throughput and geographical spread. Feedlot, grass-fed and dairy cattle will be sampled. Poultry processing plants were selected to be representative of the major companies from each of the states to account for differences in antimicrobial use regimes between companies and between states.

Samples will be cultured for *Escherichia coli* and *Enterococcus* spp. (cattle, pigs, poultry) and *Campylobacter* spp. (poultry) at veterinary laboratories in Queensland, New South Wales and Victoria. Antimicrobial sensitivity testing using agar or broth microdilution techniques will be carried out at laboratories in Queensland, New South Wales and South Australia. Antimicrobials to be tested vary according to the bacterial species. They include antibiotics used in animal husbandry, those closely related human antimicrobials where there is the potential for cross-resistance, and some human antimicrobials not used in food animals in Australia (e.g. vancomycin, ciprofloxacin), but which have gained a public health profile overseas.

Following primary interpretation of the results by the Technical Reference Group, results will be discussed with each industry sector. Wider stakeholder groups will have the opportunity to consider the results, which will then be forwarded to the Expert Advisory Group on Antimicrobial Resistance (EAGAR, see www.nhmrc.gov.au/eagar/contents.htm) for consideration and reporting as part of the national antimicrobial resistance surveillance dataset that is used to inform future surveillance activities and the management of AMR in Australia.

Contributed by: Gwendeline Lee, Product Safety and Integrity, DAFF

Australian Wildlife Health Network

The Australian Wildlife Health Network (AWHN) receives reports of wildlife incidents, and definitive diagnoses of causes of death, in wildlife in Australia. The AWHN is now also responsible for the capture and reporting of data relating to the testing of bats for viral diseases. The AWHN appreciates copies of test results, both positive and negative. 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 protocol for handling of wildlife samples, developed at the direction of Animal Health Committee, has now been finalised (see *AHSQ* Vol. 8, Nos. 1 and 2). A summary report is in preparation.

The AWHN database is being closely considered by the National Information Managers Technical Group (NIMTG), as part of the development of requirements (including business rules and data models) for Surveillance, Quarantine, Control and Recovery (SQCR) programs.

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

relating to wild birds.

FREE RANGING WILD ANIMALS—BIRDS

Botulism is suspected in the deaths of up to seventy waterbirds near Bendigo. The deaths, which occurred over a two-month period from mid-November 2003 and affected at least five species of birds, are linked to the consumption of maggots that developed in unburied chicken carcases at the local refuse tip. Since burial of the carcases, only four additional deaths have been reported.

Five mass bird kills have been reported to the Network this quarter. However, factors including isolation, delay in locating animals, and weather, have hindered thorough investigation and reporting of the events.

FREE RANGING WILD ANIMALS—OTHER

Deaths of 20 eastern grey kangaroos (*Macropus giganteus*) and 8 red-necked wallabies (*Macropus rufogriseus*) occurred near Newcastle, New South Wales over a three-month period from October 2003. Post mortem examination of one eastern grey kangaroo revealed probable haematozoan infection. The identity of this presumed apicomplexan parasite, its arthropod vector, and details of the epidemiology, remain to be determined.

CAPTIVE WILD ANIMALS

Subsequent to the first Australian report of ophidian paramyxoviral (OPMV) infection in snakes (see *AHSQ* Vol. 8, No. 3), infection of another snake with OPMV is suspected, based on histopathological findings. Further test results are pending for this snake, which was a carpet python (*Morelia spilota*) from Western Australia.

BAT VIRAL DISEASES

A summary of testing for bat viruses throughout Australia during the quarter is presented below. The AHWN has received no reports of testing for Australian bat lyssaviruses from states other than those listed, and no reports of testing for other bat viral diseases (Hendra, Menangle, Nipah viruses) from any jurisdiction.

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

Results of testing for bat viral diseases

DISEASE SPECIES	STATE	CATEGORY	NUMBER TESTED	FINDINGS
Australian bat lyssavirus				
Grey-headed flying-fox (*Pteropus policephalus)*	NSW	2	2	1 negative; 1 positive+
	NSW	3	3	negative
Not stated	NSW	2	1	negative
	NSW	3	4	negative
Black flying-fox (*Pteropus alecto*)	NSW	2	1	positive+
	NSW	3	1	negative
Greater long-eared bat *(Nyctophilus timoriensis sherrini)*	Tas.	2	1	negative

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 fluorescent antibody test, Tagman assay specific polymerase chain reaction test for pteroid ABL on brain homogenate, immunohistochemistry (immunoperoxidase test for lyssavirus), and virus isolation.

Aquatic animal health

EXERCISE TETHYS

A feature article on Exercise Tethys, Australia's largest aquatic animal disease outbreak simulation, can be found on page 1 of this issue. The exercise involved an imaginary disease outbreak on a native silver perch (*Bidyanus bidyanus*) farm in NSW in the heart of the Murray Darling Basin. Exercise Tethys confirmed Australia's preparedness to identify, control and eradicate exotic disease in aquatic animals.

AQUATIC ANIMAL HEALTH SUBPROGRAM SCIENTIFIC CONFERENCE

The Fisheries Research and Development Corporation Aquatic Animal Health Subprogram held its first Scientific Conference in Geelong (8–10 October 2003). Future conferences are to be biannual. Research scientists and managers gave presentations and discussed current and future research on aquatic animal health. Topics covered were:

- Parasites (amoebic gill disease, QX disease (*Marteilia sydneyi*), perkinsosis, parasite survey of Southern bluefin tuna)
- Finfish health (aquabirnaviruses, nodaviruses, aquareoviruses, epizootic ulcerative syndrome)
- Crustacean health (spawner-isolated mortality virus, white spot syndrome virus, *Penaeus monodon* domestication, health survey of Western Australian commercial prawn stocks)
- Training and tools for pilchard diseases (pilchard herpes virus, pilchard cell lines, new pilchard virus)
- Bacteriology (vibrios, *Piscirickettsia salmonis*)
- Finfish immunology
- Infectious salmon anaemia

Ron Stagg, Deputy Chief Executive and Director of Aquaculture and Aquatic Animal Health Programme, (Aberdeen, United Kingdom) was the guest speaker at the conference. He gave three presentations on 'Infectious salmon anaemia, an emerging global disease of salmon aquaculture'.

The Final Report and the Proceedings of the conference will be freely available (on CD-Rom) to interested parties at the beginning of March 2004.

DEVELOPING A NEW NATIONAL STRATEGY FOR AQUATIC ANIMAL HEALTH

The Australian Government Department of Agriculture, Fisheries and Forestry funded a second foresighting workshop in November 2003. The first workshop had been held in June 2003 in Perth for the National Aquatic Animal Health – Technical Working Group. The purpose of this second workshop was to gain government and industry opinions on the health issues that will face the aquaculture industry over the years 2005–10. At the workshop, participants were asked to rank the issues in order of importance to the industry. The highlighted issues included:

- surveillance, monitoring and reporting;
- cost-sharing arrangements;
- harmonisation of approaches within Australia and internationally;
- human resources and education;
- research into immunology for drug replacement and drug alternatives.

These issues will be major components of a new national aquatic animal health strategic plan to supersede AQUAPLAN, Australia's National Strategic Plan for Aquatic Animal Health 1998–2003.

Contributed by: Iain East, OCVO, DAFF

State and Territory reports

New South Wales

Contributed by:
Barbara Moloney
NSW Agriculture

ANTHRAX

There were two cases of anthrax during the quarter, both confirmed by laboratory examination of peripheral blood smears. The first occurred in November on a property in the Hay district, where 60 out of 1750 sheep died over a 10-day period. The second occurred in December on a property in the Nyngan district, where six out of 900 sheep died over a 6-day period. Neither property had a known history of anthrax but both are located within the endemic anthrax area of the state. Properties were placed in quarantine, carcases were burnt, and all at-risk animals vaccinated.

Eleven other investigations for anthrax during the quarter were negative. Six were in sheep, where diagnoses included bacterial mastitis and suspect pyrrolizidine alkaloid poisoning. Four investigations were in cattle, however no alternative diagnoses were found. The ninth negative investigation was in an eight-year old cat, which came from the anthrax endemic area, and died with gross post-mortem signs suggestive of anthrax. Acute clostridial infection was suspected.

FOOT-AND-MOUTH DISEASE EXCLUSION

A diagnostic response team investigated a possible vesicular disease incident on a hobby farm on the outskirts of Sydney in early November. This followed an alert by a private practitioner to the Chief Veterinary Officer via the Exotic Disease Hotline. The owner had noticed lesions on the muzzle of an 11-month-old heifer, which had been observed to be in contact with a stray calf during the previous four weeks. Additionally, lesions were observed on the teats of the heifer's mother. Lameness was not observed in any of the five animals on the property. Examination by the diagnostic response team suggested 'papular stomatitis of possible viral aetiology but NOT consistent with foot-and-mouth disease (FMD)' as the provisional diagnosis.

For definite FMD exclusion, serum samples were tested at Australian Animal Health Laboratory (Geelong) with the competitive enzyme-linked immunosorbent assay (ELISA), and agar gel immunodiffusion (AGID) test. Both were negative for FMD antibodies. Fresh excised papule tissue from the lip and teat scab were both negative to the antigen capture ELISA, and the Tetracore Taqman assay. First and second passages of attempted virus isolation for FMD and other exotic vesicular diseases were also negative.

CHLAMYDIOSIS IN POULTRY

Chlamydiosis was diagnosed in a breeder chicken flock following the serological diagnosis of the disease in poultry workers. There were minimal clinical signs in the birds. Immunofluorescence testing on splenic and/or conjunctival smears from birds selected with ocular discharge, were positive in at least one bird, from each of two of the three sheds on the property. The flock was treated with in-feed medication and staff were addressed on occupational health and safety issues.

STRANGLES

Eleven cases of strangles were reported in horses during the quarter. Most cases involved retropharyngeal abscesses in one or more animals.

PORCINE MYOCARDITIS SYNDROME

An investigation into an apparently new syndrome affecting pigs was reported last quarter (NSW State report, *AHSQ*, Vol. 8, No. 3). The syndrome, called 'porcine myocarditis' (PMC), only affects newborn piglets and those up to five weeks of age. PMC appears to be a new disease. It has been limited to two piggeries in NSW, both of which are owned and operated by the same company. The properties are under movement controls with strict protocols in place. The disease has been listed as a notifiable disease under the NSW Stock Diseases Act.

Clinically, PMC presents as an increase in stillbirths and pre-weaning mortalities. There is also a variable but significant increase in the incidence of mummified foetuses. The gross pathological changes consist of small pale areas in the myocardium. There is often evidence of cardiac enlargement and an increase in the volume of body fluids, consistent with congestive heart failure. Histologically, there is a non-suppurative myocarditis. It is believed that the syndrome is due to a viral infection predominantly, if not exclusively, occurring in utero. The epidemiology and clinical expression of this disease is consistent with the introduction or emergence of a new infectious agent into a fully susceptible population. PMC is already resolving itself, with piglet losses due to the disease now approaching zero.

Extensive laboratory investigations utilising virus isolation, antigen detection, PCR, and serology have excluded a wide range of endemic and exotic viral

infections of pigs. Endemic agents excluded that have been previously identified in pigs in some locations in Australia include encephalomyocarditis virus, porcine parvovirus, porcine circovirus (PCV1 and PCV2). Exotic diseases excluded include foot-and-mouth disease, PRRS, Aujesky's disease, classical swine fever, and Menangle virus.

Despite rigorous scientific investigation, there has been no evidence of PMC in piglets over five weeks of age. No impact on human health or food safety has been identified. Pigs grown to market weight have shown no sign of the disease at slaughter. Research continues in order to identify the exact cause of PMC.

PATERSON'S CURSE POISONING IN HORSES

The drought, with last year's autumn rains, produced suitable conditions for good germination of Paterson's Curse (*Echium plantagineum*). Through winter, because of lack of feed, many horses in the Southern and Central Tablelands had little other choice but to eat the early rosette stage of the plant. The resulting chronic liver damage has caused the deaths of many horses, particularly around the Australian Capital Territory (ACT) where the January 2003 bushfires had removed all other pasture. Most of the deaths occurred about six months after exposure. Some cases were confirmed as pyrrolizidine alkaloid poisoning by histopathology. Private practitioners have been doing liver function tests on sick horses to provide a prognosis. Paterson's Curse is easily identified when in flower, but by that time, the damage has already been done.

Northern Territory

Contributed by:
Diana Pinch
DBIRD

BOTULISM IN CATTLE

The deaths of up to three grown-out steers per week over the course of a month on a Barkly Tablelands property were investigated. Affected animals were usually found in lateral recumbency near water points, with death occurring the next day. Clinical examination of two animals revealed moderate tongue paralysis, rumen stasis and a progressively worsening paralysis that resulted in death. No abnormalities were visible at post mortem examination, and no significant lesions were detected by histopathological examination of various tissues. Both animals had decreased serum phosphorus concentrations. A diagnosis of botulism was made, and advice on vaccination was given. The steers were brought to the property from several other properties, and the vaccination status of the source herds was unknown. An increase in bone chewing had been observed during the preceding two months.

SALMONELLOSIS IN CATTLE AND A HORSE

Fourteen dairy heifers were transported from Queensland to a station in the Katherine region. A two-year-old heifer was reported to be depressed, inappetant, and recumbent, with bright yellow diarrhoea. A post mortem examination was carried out on this heifer approximately 12 hours after death. The entire gastrointestinal tract was inflamed, with petechial haemorrhage throughout, and had bright yellow liquid contents. The faeces were bright green, and liquid. *Salmonella* Reading was cultured from several gastrointestinal tract samples. *Salmonella* Virchow was cultured from the faeces of a 15–18-month-old Friesian-Jersey cross-bred heifer, which developed diarrhoea two days after examination. No *Salmonella* spp. were cultured from a third animal examined, a 12–15 month old Jersey with nasal discharge, inappetence, and an extended head and neck. However, a few days later, *Salmonella* Infantis was cultured from the faeces of another sick heifer.

Salmonella Poona was isolated from the faeces of an old mare from the Katherine region that was reported to have chronic weight loss and intermittent diarrhoea.

POLYARTHRITIS AND ACUTE RETICULOPERICARDITIS IN A HEIFER

A 15-month-old heifer (from the Darwin region) with multiple swollen joints was found to have acute reticulopericarditis, with infection of the myocardium and kidney cortex likely resulting from haematogenous spread. Several pieces of short, straight wire were found in the reticulum, and *Fusobacterium necrophorum* and *Arcanobacterium pyogenes* were isolated from the joints.

POULTRY PROBLEMS

Three of 20 three to four-week-old chicks in the Darwin area were found dead. Post mortem examination showed dark red, firm lungs and scattered haemorrhages. On histological examination, there was marked diffuse congestion in the lungs, with haemorrhage and fibrin in the large airways. Findings were consistent with subacute viral or bacterial septicaemia. *Streptococcus* sp. was isolated from the lungs of two birds. A coccidial burden was present, including *Eimeria tenella* and *E. necatrix*. Tissues from the chicks were submitted to the Australian Animal Health Laboratory at Geelong to test for avian influenza or mesogenic Newcastle viral infection. Impression smears, virus isolation and immunohistochemistry tests were negative.

Queensland

Contributed by:
David Pitt
QDPI

BOTULISM

One of 30 two-year-old mixed-sex cattle from a property in the Livingstone shire near Rockhampton was anorectic and lethargic. *Clostridium botulinum* toxins types C and D were detected by an enzyme-linked immunosorbent antigen (ELISA) test in serum taken from the animal at post mortem examination.

On another property in the Livingstone shire near Rockhampton, two of 240 three-year old cows were sick, and 46 died, over a period of several months. Post mortem examination of one animal revealed marked encephalopathy and severe wallerian degeneration of the spinal cord. *C. botulinum* toxins types C and D were detected in serum and intestinal contents by the ELISA antigen test. Tests for transmissible spongiform encephalopathies were negative.

Flaccid paralysis was observed in a small homebred layer flock in the Mackay shire. Thirty-four of 125 chickens died, and 40 more were sick. Maggots were found in crop contents at post mortem examination, suggesting exposure to carrion. Other findings included cryptosporidiosis, keratoconjunctivitis and rhinitis. *C. botulinum* toxin type C was detected using an animal inoculation test. It is possible that, initially, some birds died from causes other than botulism, and that consumption of their carcases by other birds led to an outbreak of botulism in the flock.

Botulism was suspected in a flock of 600–800 free-ranging Australorp hens near Mareeba. There was a history of acute paralysis, and 50 deaths. Some birds were lame, and some had diarrhoea. Affected birds died, or recovered within two days. Cannibalism was noted. One dead and three live birds were submitted to Oonoonba Veterinary Laboratory. There were no significant gross or microscopic findings at post mortem examination, ruling out Marek's disease and riboflavin deficiency. The owner was advised that remaining birds should be denied assess to stagnant water and other potential sources of botulism toxins.

PLANT POISONINGS

Two cattle from Monto shire had weight loss, scouring, ataxic gait, fetlock knuckling and head tremor. Neurological abnormalities included aggression, hyperaesthesia, and hind limb proprioceptive deficits. Wallerian degeneration was severe in the ventral and lateral white matter of spinal cord segments, and moderate in the medulla and obex of the brainstem. Poisoning by *Macrozamia mountperriensis* (a cycad) was suspected.

On a property in the Broadsound shire in central Queensland, nine of 150 mixed-age cows died, and another was sick. Clinical signs included jaundice, recumbency and neurological signs. Liver pathology was consistent with lantana (*Lantana camara*) poisoning.

Xanthorrhoea spp. (grasstree) poisoning was diagnosed in beef cattle on a south Queensland grazing property. Twenty-five of 800 breeder cattle died, and two were sick. Typical signs of grasstree poisoning, such as incoordination, were seen. There was evidence that cattle had eaten grasstrees, and little alternative fodder was available due to the prevailing drought conditions. Rumen samples taken from autopsied animals contained leaves of *Xanthorrhoea* spp.

PNEUMONIA

Eight unweaned beef calves died suddenly on a property near Kenilworth in south-east Queensland. A post mortem examination was performed on one calf, and bronchopneumonia was observed. The history, autopsy results, and histopathological lesions were considered pathognomonic for infection with *Pasteurella haemolytica*.

On a dairy goat property in the Lockyer Valley, six of 30 eight-week-old kids had coughing, diarrhoea, and signs of ill-thrift, and another four kids died. The illnesses and deaths were attributed to a combination of pasteurellosis, coccidiosis and colibacillosis.

A piggery in the Banana shire in central Queensland has had an ongoing problem with enzootic pneumonia affecting four-month-old pigs. On two occasions, both *Pasteurella multocida* and *Actinobacillus pleuropneumoniae* have been isolated from pneumonic lung tissue.

GASTOINTESTINAL NEMATODE INFESTATIONS

Deaths of forty of 150 cross-bred Boer goats (mostly weaners) from a Forsayth property in north Queensland were due to haemonchosis and trichostrongylosis. Haemonchosis also was diagnosed in cattle on a Sarina property. Heavy infestations with *Cooperia* spp. and *Trichostrongylus* spp. contributed to the deaths of 12 of 50 eighteen-month-old steers on a property in the Calliope shire near Gladstone.

POISONINGS

Chlorpyrifos sprayed for termite control was responsible for the deaths of 880 (1%) of a flock of day-old chickens on a property on the Sunshine Coast. Mortalities occurred immediately upon placement of the chickens in the shed.

POULTRY DISEASES

A combination of cholangiohepatitis, egg peritonitis and Marek's disease was found to be responsible for deaths (200) and sickness (500) in a 21-week-old layer flock of 6500 chickens near Brisbane.

Infectious laryngotracheitis (ILT), in combination with mycoplasmosis, was detected in a commercial layer flock (30 dead from 8000) near Brisbane, and in a backyard flock (20 dead from 70) near Dayboro in south-east Queensland. Both flocks were quarantined, and vaccinated for ILT. After the cessation of clinical signs, both flocks were released from quarantine.

TRACE ELEMENT DEFICIENCIES

A property near Charleville has a four-year history of swayback (enzootic ataxia) in goat kids in one particular paddock. The kids do not show signs until reaching at least three months (sometimes four to six) months of age. Ataxia is followed by hindquarter paralysis. The kids remain bright and continue to eat. Copper deficiency is suspected due to the clinical presentation, low serum copper concentration, and typical histological lesions seen in samples submitted from the most recent case. As trace element deficiencies are rarely reported in the Queensland outback, further investigations are planned. Additional liver samples have been submitted for assessment of copper concentrations. Tree (gidgee) and feed (cottonseed) samples have been collected and will be analysed for copper, molybdenum, sulphur and iron concentrations.

TICK FEVERS

Anaplasma marginale was identified in smears taken from sick Charolais cows on a property in the Duaringa shire in central Queensland. The herd has had ongoing problems with anaplasmosis, despite vaccination of the cattle with an *A. centrale* vaccine. All cows had detectable antibody titres to this vaccine strain. More than 40 of the 400 cows have were sick, and 12 died out of a herd totalling approximately 1200. The herd has a history of a severe and persistent tick problem. Stress and immunosuppression from this tick burden may be contributing to this problem, but other possibilities are also under consideration. An experimental *A. marginale* vaccine (Dawn strain) made from a mild strain of *A. marginale* of Queensland origin is being tried on the herd. In addition, efforts are being made to improve tick control.

Babesia bovis was responsible for mortalities (three of 200, and two of 40) in cattle on two different Banana shire properties. *Babesia bigemina* also was diagnosed in the Banana shire, with eight cattle that had recently arrived from a tick-free area showing signs of haemoglobinuria and fever. Babesiosis was considered to be the cause of death in a cow found dead on a Livingstone shire property in central Queensland.

PESTIVIRUS (BOVINE VIRAL DIARRHOEA)

Pestiviral infection was diagnosed as the cause of ill-thrift in a group of 64 yearling cattle on a farm in the Banana shire. Healthy weaners from the same group as the virus-positive animals had high pestiviral antibody titres. Losses had been occurring for a number of years, suggesting the virus was endemic in the herd.

Another herd in the Banana shire with approximately 200 cows and heifers experienced a reduction in pregnancy rate from 85% to 68% in 2003. In addition, many calves were weak, and died before reaching branding age. One surviving sick calf tested positive for pestiviral antigen. Twelve cows that had lost calves had high pestiviral antibody titres. A four-year-old steer that was in poor condition when purchased two years previously tested positive for pestiviral antigen. This steer, which has been running with the cow herd, is considered the likely source of infection for this herd.

CAMPYLOBACTER AND *TRICHOMONAS*

The reproductive tracts of 10 bulls from a Carpentaria shire property in far north-west Queensland were cultured for *Campylobacter fetus*, with negative results. However, two had positive culture results for *Trichomonas fetus*.

South Australia

Contributed by:
John Weaver
PIRSA

INFECTIOUS LARYNGOTRACHEITIS (ILT) IN LAYER AND MEAT CHICKENS

Commercial layer pullets on a layer poultry farm just to the north of Adelaide suffered a sudden increase in mortality associated with a mild respiratory disease. The birds had been placed in the cages about 6 weeks earlier. About 100 birds in the 5000-bird flock died. Infectious laryngotracheitis (ILT) was suspected, and confirmed by polymerase chain reaction (PCR) testing by the Melbourne University Veterinary Faculty Poultry Group. The PCR test suggested that the virus was an SA2 type. SA2 is an ILT strain that had been isolated in South Australia, then attenuated to make a vaccine. The flock had been vaccinated with an A20 strain vaccine, which is a mild strain that does not provide a long-term immunity. 'Hotter' ILT virus types appear able to break through in birds not recently vaccinated. It was hypothesised that the flock was either cross-infected from older birds on the farm that

had been vaccinated with SA2, or that it was a wild-type virus similar to SA2.

About 3 weeks later, a severe clinical respiratory disease was reported in the same area in 35-day-old meat chickens. Birds were coughing blood and mortality approached 50 per day. ILT was suspected and confirmed histologically by the Melbourne group. Culture and typing results are pending.

ACTINOBACILLOSIS SEMINIS INFECTION IN A RAM.

Actinobacillus seminis infection was diagnosed on the York Peninsular in a ram with a swollen scrotum. The scrotum, which had been swollen for at least three months, was approximately 40cm wide and dragged on the ground. The testicles could not be palpated due to the swelling. Differential diagnoses included *Brucella ovis, Actinobacillus seminis,* neoplasia and trauma. A Gram-negative organism, consistent with *Actinobacillus* spp., was isolated from scrotal fluid. The ram's blood was tested by a complement fixation test for *A seminis*,with positive results. The ram, which had not previously been used for mating, was part of a ram flock. None of the other rams tested positive. Laboratory confirmation of the diagnosis was required, as actinobacillosis cannot be distinguished from ovine brucellosis on the basis of clinical signs. Actinobacillosis infection can be difficult to control, as transmission is thought to occur perinatally from ewes to their lambs, between young rams via homosexual activity, and to ewes at mating.

CHRONIC LIVER HEPATOPATHY IN SHEEP

During late December, 14 of a flock of 35 two-year-old cross-bred ewes were found dead on a property near Maitland on the York Peninsular. The dead sheep had opisthotonus, and the ground at their feet was disturbed. Some sheep were depressed, and several were recumbent and severely jaundiced. Post mortem examinations and serum biochemistry results were consisted with exposure to a hepatotoxin. Differential diagnoses considered were pyrrolizidine alkaloid toxicity, mycotoxicosis and copper toxicity. Due to the nature of the deaths, annual rye grass toxicity (ARGT) was suspected of contributing to the syndrome. Further investigation revealed no history of copper supplementation, and there was insufficient rye grass present in the paddock to submit for testing. Examination of the stubble did not reveal the obvious presence of plants known to be associated with pyrrolizidine alkaloid toxicity. Examination of the brain indicated no changes consistent with ARGT, but there was extensive vacuolation of white matter tracts consistent with severe hepatic disease and the development of a spongiform myelinopathy. Further transmissible spongiform encephalopathy exclusion tests are pending. The copper serum levels were high, but this is thought to be secondary to the liver compromise. As the losses are continuing, further investigations are being undertaken on the property to attempt to identify the cause of the hepatotoxicity.

URINARY CALCULI IN WETHERS

Deaths of wethers in a flock of 1400 sheep on a property in the Angaston region were first observed in early November (prior to shearing) and continued for several weeks. Over this period, the death rate increased from approximately three animals per week, to three per day. The flock (700 each of ewes and wethers) was grazing unimproved pastures of capeweed, Paterson's Curse, clovers and barley grass. Two wethers with extremely distended abdomens were euthanised and post mortem examinations were conducted. Abdomens were fluid-filled, and bladders were ruptured. Numerous uroliths up to 2.5 mm in diameter were found in the urethra. As the uroliths were composed of calcium carbonate, they were probably associated therefore are likely to have been associated with the clovers in the pasture. The sheep were moved to another paddock and treated with ammonium chloride to acidify the urine, after which no further deaths were reported.

FLYSTRIKE ON KANGAROO ISLAND

Flystrike was widespread and severe across Kangaroo Island in late December. Between 15 and 45mm of rain fell followed by humid weather, creating ideal conditions for the flies. Many flocks were carrying between eight and twelve months' wool growth. The strikes mostly occurred on the body, making early detection difficult. Two producers reported up to 50 and 150 deaths, respectively.

Tasmania

Contributed by:
John Elliott
DPIWE, Tasmania

CONGENITAL SKIN DEFECTS IN SHEEP

Skin lesions in the mouth and on the feet of twin lambs were investigated as part of an exotic disease exclusion. The small flock, from a farm near Westbury, consisted of a Suffolk ram, three Suffolk-cross ewes (daughters of the ram) and two sets of twin lambs, all sired by the ram. One set of twins was poorly grown and in light body condition. Both twins had crusty lesions around the coronary band. The skin between the claws of all feet was fragile and had been bleeding. One lamb had an imperfectly formed hoof. There were shallow lesions on the dental pad, hard

palate, the dorsal surface of the tongue and nostrils. One animal had a tag of necrotic tissue hanging from the dental pad. The lesions in the mouth and on the nose were very shallow and did not appear to involve the deeper layers of the skin and mucosa. Temperatures were normal. The second set of twins had scald in all feet and were lame, but otherwise healthy. The ewes had no clinical signs. The skin lesions were thought to be due to epitheliogenesis imperfecta or epidermolysis bullosa. Several types of inherited defects of the epidermis are recognized. Epidermolysis bullosa is characterized by the formation of vesicles either spontaneously or in response to trauma. In animals, there are few reports of congenital skin disease of this type. An inherited disease of Angus calves characterized by shedding of the epidermis of the oral mucosa and exposed parts of the limbs has been reported. A disease with a similar clinical appearance has also been described in Suffolk and South Dorset Down sheep in New Zealand.

BEE PEST

A report of suspected mites on bees made via the exotic disease hotline was investigated to rule out the possibility of a *Varroa* mite infestation near Kingston. The 'mites' were identified as *Braula coeca*, the so-called bee louse. This 'louse' is actually a minute, highly modified, wingless fly (1.2 to 1.5 mm long). The insects attach themselves to bees (particularly the queen), eat nectar and pollen at the mouth of bees, and feed on material excreted from the host. The larvae consume wax, honey and pollen, tunnelling through the wax comb. They pupate near the ends of the tunnels. After emergence, the adults make their way to the surface of the comb. Although there is very little impact on bees or honey production, tunnelling by the larvae spoils the appearance of honeycomb destined for human consumption. *Braula coeca* is endemic on most continents, but in Australia has been reported only in Tasmania. Consequently, Australian Quarantine and Inspection Service (AQIS) regulations limit the export of bees and bee products to other States and Territories. Tasmania has recently developed protocols, approved by AQIS, for the export of freeze-treated comb honey to mainland Australia. All States have recently accepted this treatment.

ATTACK BY GREATER LONG-EARED BAT

An injured greater long-eared bat (*Nyctophilus timoriensis sherrini*) was found in a shed on a farm near Scottsdale. The bat bit the shed-owner when it was picked up. The incident was reported to the Injured and Orphaned Wildlife Program and to Public and Environmental Health. The bitten person was given immunoglobulin treatment as soon as possible and the bat was submitted to the laboratory for lyssavirus exclusion. As the incident involved an attack by a bat, the carcase was forwarded directly to the Australian Animal Health Laboratory at Geelong. Negative results were obtained for the fluorescent antibody test, TaqMan polymerase chain reaction assay, and immunoperoxidase test.

LABORATORY ACCESSIONS AND NOTIFIABLE DISEASES

During the quarter, there were 81 aquaculture accessions, 488 livestock accessions, 41 companion animal accessions, 70 wildlife accessions and 8 accessions from other sources.

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

Disease	Investigations	
	+ve	No.
Aeromonas salmonicida subsp. *salmonicida*	0	50
American Foul Brood	1	1
Anthrax	0	14
Avian psittacosis	0	2
Brucella abortus (bovine brucellosis)	0	13
Brucella ovis	0	20
Clinical salmonellosis	13	84
Contagious agalactia	0	5
Enzootic bovine leucosis	0	4
Hydatids	1	5
Iridovirosis of Shellfish	0	2
Johne's Disease	4	100
Leptospira hardjo	1	14
Leptospira pomona	0	27
Listeria	0	3
Negative Finfish Bacteriology*	0	47
Negative Finfish Pathology+	0	1
Nocardiosis of shellfish	0	2
Perkinsosis of shellfish	0	2
Salmonella Abortusequi	0	1
Salmonella Abortusovis	0	5
Salmonella Enteritidis	0	6
Transmissable Spongiform Encephalopathy	0	1
Verotoxic *Escherichia coli*	0	93

* Bacterial kidney disease, furunculosis, goldfish ulcer disease, streptococcosis of salmonids

\+ Epizootic ulcerative syndrome, epizootic haematopoietic necrosis, infectious haematopoietic necrosis, infectious pancreatic necrosis, *Oncorhynchus masou* virus disease, spring viraemia of carp, viral encephalopathy and retinopathy, viral haemorrhagic septicaemia

Victoria

Contributed by:
Tristan Jubb
DPI, Victoria

STILLBIRTHS IN PIGS

A piggery near Bendigo had high perinatal mortalities during 2003. When the problem began some six months previously, a sow vaccination program against parvovirus and neonatal colibacillosis was started, and vaccinated sows were just beginning to farrow at the time of investigation of the problem. There were no abnormal necropsy findings in eight still- or weak-born neonates. Bacteriological and histological examinations were negative for any evidence of an infectious cause, including encephalomyocarditis virus, leptospirosis and parvovirus infection. Immunoglobulin G antibodies were absent in sera and serosal fluid, suggesting failure of passive transfer of colostral immunoglobulins. On a farm visit, it was observed that pigs were being born in outside shelters without farrowing crates and inadequate creep heating. It was concluded that piglets were being chilled at birth, and dying from a combination of factors including hypoglycaemia, hypothermia and overlay. Following improvements to farrowing conditions, coinciding with births of piglets to the vaccinated sows, the preweaning mortality rate and stillbirth level returned to normal.

SUDDEN DEATH IN MINIATURE HORSES

In December, two Australian miniature horses arrived in Melbourne after travelling from Tasmania by ferry. On the day of arrival, each was transported to a separate destination, one to a property near Sale in east Gippsland, the other to a property near Emerald on the outskirts of Melbourne. The Sale horse arrived at 2.00 am and was found dead at 11.00 am with no premonitory signs of illness. The Emerald horse was found *in extremis* at the same time, and died within 30 minutes of the Sale horse. Only the Sale horse was autopsied; severely congested and oedematous lungs were found. Importantly, there was no evidence of pulmonary vasculitis on histologic examination, thus excluding Hendra virus. There was sinusoidal thrombosis in the liver. The lesions were not consistent with Hendra virus, and no significant bacteria were isolated on bacteriology. The cause of the deaths is uncertain, although metabolic disease associated with the stress of transport may be involved.

NERVOUS SIGNS AND DIARRHOEA IN DAIRY CATTLE

Twenty of 250 dairy cows from a herd near Leongatha in south Gippsland developed blindness and ataxia over a three-week period. Another eight cows developed bloody diarrhoea, and two more had all these signs. The herd's milk production dropped by about 200 litres per day, with up to 15 cows producing almost no milk. One of the two cows that died was autopsied, and had a large quantity of bloody fluid in the caecum. A range of tests applied to water, feed and animals did not assist in the making of a diagnosis, but it is believed that salmonellosis and recent formulation changes to a high grain diet were involved. The total cost of the incident was estimated to exceed $5000.

DIARRHOEA IN DAIRY CATTLE

Deaths of 17 cows and a drop in milk production in a 400-cow dairy herd near Echuca in northern Victoria were attributed to a primary rumen acidosis followed by salmonellosis. Large quantities of finely crushed grain were fed and problems began when the grain was changed from triticale to wheat. *Salmonella* Typhimurium was cultured from the faeces of some affected cattle. The cows were vaccinated, the grain in the diet changed, dietary bicarbonate was increased, sick cows were given antibiotics and the outbreak ceased. The combined costs of deaths, treatments and lost production exceeded $30,000.

HEMLOCK POISONING OF CATTLE

In mid-October, two of 50 eighteen-month-old heifers were found recumbent in a paddock on a property near Warrnambool in the south-west region. The paddock had been sprayed 10 days previously with a broad-leaf weedkiller mixture to reduce the number of thistles. The heifers had a flaccid hind limb paralysis and were extremely weak. Post mortem examination findings and serum biochemistry data were unremarkable. The clinical signs were consistent with poisoning by hemlock (*Conium maculatum*), which contains a number of toxic pyridine alkaloids. The plants were abundant in the paddock, and the weedkiller, which contained 2-methyl-4-chlorophenoxyacetic acid, may have rendered the hemlock plants more palatable to the cattle. The surviving cattle remained on the pasture, but there were no further cases.

MYCOTOXICOSIS IN CATTLE

In a beef herd near Geelong in south-west Victoria, 19 of 99 yearlings died and another 23 became sick after being fed mouldy sprouted barley. The barley, which was grown hydroponically in sheds, became overgrown with *Aspergillus clavatus* during a period of warmer spring weather. Affected cattle showed muscle tremors and ataxia with hind limb knuckling. Severe cases progressed through recumbency to death. The cost of the outbreak exceeded $16,000. The syndrome is well known, and the risks of feeding mouldy sprouted grains have been documented. Similar outbreaks have occurred in Queensland and New

South Wales in recent years as the feeding of hydroponically grown feeds to livestock has been promoted.

LEAD POISONING IN CATTLE

In a beef herd near Swan Hill in north-west Victoria, five of 28 cattle were found dead in a paddock. The owner reported observing nervous signs in two animals before they died. As anthrax was considered possible, samples for anthrax diagnosis were collected, but a complete post mortem examination was not performed. Results for anthrax were negative. A number of well-chewed car batteries were found during an inspection of the paddock some days later, and lead poisoning was diagnosed. The replacement cost of the cattle was estimated to be more than $2500.

FOOTROT IN CATTLE

In a beef herd near Yea in north-east Victoria, 26 of 42 cows and calves developed severe lameness. The cattle were grazing lush, knee-high clover and phalaris pastures in wet conditions and had developed footrot. The peculiar conformation of the feet of the cattle in this herd may have predisposed them to interdigital trauma as they were very “upright” in the pasterns and tended to spread their claws widely when they walked. Treatment with antibiotics was unsuccessful until they were moved to a drier paddock with shorter pasture.

COPPER DEFICIENCY IN LAMBS

In a sheep flock near Maffra in east Gippsland, about 3% of lambs in one group were affected by a failure to thrive, and varying degrees of hind limb ataxia. Some were permanently recumbent. No gross abnormalities were found at post mortem examination. However, cerebrospinal and peripheral axonopathy consistent with neonatal hypocuprosis was apparent on histological examination. The area is marginally deficient in copper, and 'swayback' occasionally occurs.

HELIOTROPE POISONING IN SHEEP

In a first-cross ewe flock near Mildura in north-west Victoria, about 40 of 2100 ewes were found dead after grazing wheat stubbles. Precautions had been taken to reduce the risks posed by excessive grain intake. The sheep had been vaccinated at least twice against enterotoxaemia, and had been incrementally introduced to the stubbles over a week to avoid rumen acidosis. The deaths were attributed to heliotrope (*Heliotropium europeum*) poisoning, as the plant was abundant and the microscopic changes seen in the livers were consistent with this diagnosis. The cost of the outbreak exceeded $6000.

CHLAMYDIAL POLYARTHRITIS IN SHEEP

In a Poll Dorset flock near Swan Hill in northern Victoria, chlamydial infection was determined to be the cause of arthritis in up to 5% of lambs. The problems had been occurring for some years despite high standards of hygiene at marking, and vaccination against erysipelas. Adult sheep had a high prevalence of elevated antibody titres to chlamydia. Clusters of fluorescent structures, morphologically consistent with chlamydia, were seen in synovial scrapings from arthritic lambs.

Western Australia

Contributed by:
Richard Norris
Department of Agriculture – WA

SURVEILLANCE ACTIVITIES

Laboratory testing was conducted on 630 investigations of animal disease during the quarter. Of these, 272 were cost-recovery (private benefit) cases and 358 were charge-exempt (public benefit and therefore funded directly by the Government). There was one exotic disease alert and four notifiable disease reports during the quarter. Fifty-four significant disease outbreaks with mortality or morbidity greater than 10% were investigated during this period

NOTIFIABLE DISEASES

Three category C (discretionary quarantine) and one category B (mandatory quarantine) notifiable diseases were reported during the quarter. Ovine Johne's disease was confirmed by histology and polymerase chain reaction (PCR) testing on a single sheep property in the central agricultural region of Western Australia (WA). Infection was detected as part of routine abattoir surveillance and later confirmed in sheep present on the property. Surveillance of trace and neighbouring properties is underway as part of WA’s investigation into the source and spread of infection. Avian infectious laryngotracheitis was diagnosed on a poultry farm in the Narrogin shire, malignant catarrhal fever was diagnosed in cattle in the Cunderdin shire, and hydatid disease was diagnosed at abattoirs in sheep consigned from the Esperance shire.

EXOTIC DISEASE ALERTS

A case of suspect rinderpest in cattle tested negative at the Australian Animal Health Laboratory (AAHL) in Geelong. The case involved an usual presentation of bracken fern toxicity combined with possible mucosal disease infection. The post mortem examination findings included large areas of haemorrhage over Peyer’s patches in the small intestine that grossly resembled rinderpest. A serological survey in poultry is currently underway for exposure to Newcastle disease as part of Australia's strategy for managing possible

outbreaks of this disease. All results have been negative, to date.

DISEASES OF SIGNIFICANCE

During the period, significant disease outbreaks were investigated in 22 bovine and 13 ovine submissions. Presenting syndromes included diarrhoea, ill-thrift, infertility, nervous signs, production drop, respiratory signs, skin lesions, sudden death and weakness.

PHALARIS STAGGERS

An outbreak of phalaris staggers was seen in Dorper rams in the Albany area. The animals had grazed a pure phalaris pasture four months previously. The pigments (indole melanins) that accumulate in poisoning with this plant were evident grossly as pale blue areas in the mid-brain of affected sheep. This case highlighted the extensive lag phase that sometimes occurs between ingestion and clinical signs.

PARASITIC GASTROENTERITIS

Parasitic gastroenteritis was seen in sheep with increasing frequency during the spring. Heavy pasture contamination and a paucity of 'clean' pastures were seen as the major contributing factors, making parasite management very difficult, even when anthelmintics were effective. Elsewhere, allergic enteritis was seen on farms where larval ingestion was very heavy, leading to the development of eosinophilic enteritis of small and large intestines. In these instances, adult worms were absent. Severe coccidiosis, with a moderate mortality rate, was also recorded in lambs that had been recently shorn and treated with an anthelmintic.

LAMB POISON

Lamb poison (*Isotropis* spp.) was suspected as the cause of death in 20 of 350 young lambs at Dumbleyung that had severe degenerative lesions in the kidneys. As is often the case, the offending plant was difficult to find in the paddock. Similar cases have been seen previously in the district at the same time of year.

LISTERIOSIS

Hepatic listeriosis was seen in Merino rams that died at Kojonup after some months of ill-thrift. Multiple small abscesses (up to 4 mm diameter) were found throughout the liver, and *Listeria monocytogenes* was isolated. Hepatic lesions are usually present in lambs with listeriosis but this is an unusual lesion in adult animals.

PERIPHERAL MYELINOPATHY

The cause of ataxia in a six-month-old Santa Gertrudis calf from a property near Albany was considered to be peripheral myelinopathy. The only lesions present were in the peripheral nerves, which had segmental thinning and absence of myelin sheaths. The cause of the lesion was not discovered.

PHOTOSENSITIVITY DERMATITIS

Photosensitivity dermatitis in Friesian cows near Augusta on the south coast was seen as a sequel to an episode of facial eczema in the previous autumn. The cows had shown poor production since the outbreak.

MAREK'S DISEASE

Deaths in layer pullets from a flock near Perth were shown to be due to Marek's disease, with lesions in the cerebrum and cerebellum requiring differentiation from Newcastle Disease. Lesions were also found in the liver, kidneys and ovaries. Elsewhere, Marek's disease caused leg weakness in adult roosters through damage to the sciatic nerves.

FOWL POX

Fowl pox was seen as a high morbidity, high mortality disease in a small poultry establishment near Perth in which chronic respiratory disease was also evident. It was thought that the concurrent diseases contributed to the high mortality.

VITAMIN E DEFICIENCY

Increasing mortality in 13-week old chickens from a flock near Perth was associated with nervous signs in about 5% of the group. Histopathological examination of the brain revealed extensive lesions in the cerebellum, typical of nutritional encephalomalacia caused by vitamin E deficiency.

SEPTICAEMIC PASTEURELLOSIS

An unusual case of septicaemic pasteurellosis occurred in a four-week-old piglet on a trial site near Perth. Scouring was seen in 13% of the group, and one died. This animal had a disseminated inflammatory process in most organs, including the meninges. Numerous bacterial colonies were seen in all organs, and *Pasteurella multocida* was isolated. Although not a common cause of septicaemia in pigs, this diagnosis was made at the same site in the previous year.

BARRAMUNDI NODAVIRUS

Barramundi nodavirus (viral encephalopathy and retinopathy) was diagnosed in barramundi raised in tanks. Affected fish displayed signs of central nervous system dysfunction and had problems with swim bladder control. Distinctive lesions were present in the retina and brain, consisting of 'holes' in the tissue. This is the first diagnosis of nodavirus infection in WA. The source of the virus is thought to an introduced wild-caught (WA) male. Nodaviruses causing encephalopathy and retinopathy have a worldwide distribution.

Quarterly Disease Statistics

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 1.

Table 1: 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
Oct–Dec 02	3222	358	12223	462	1754	243	8163	4	1127	1	417	12
Jan–Mar 03	5604	505	16018	406	1689	308	2277	4	686	3	353	11
Apr–Jun 03	6239	725	7045	487	1526	421	851	0	561	8	504	11
Jul–Sep 03	2854	724	6307	445	1472	354	2662	8	745	0	376	26
Oct–Dec 03	11677	749	15560	278	1839	300	9555	16	773	2	234	11
NSW	865	159	1153	26	452	26	71	0	337	0	70	6
NT	728	366	661	163	666	140	1396	2	1	0	0	0
QLD	597	184	805	77	373	85	32	0	199	2	2	0
SA	158	0	181	0	0	0	1690	0	1	0	1	0
TAS	21	0	11	0	0	0	85	0	0	0	0	0
VIC	58	0	458	0	119	0	128	0	235	0	161	5
WA	9250	40	12291	12	229	49	6153	14	0	0	0	0

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. JD occurs in NSW, Victoria, Tasmania and South Australia. Surveillance programs have not identified endemic JD in Queensland, Western Australia and Northern Territory, and active measures are taken to stamp-out any incursions. Table 4 shows the number of herds and flocks known to be infected. A National Ovine Johne's Disease Control and Evaluation Program will be completed in 2004. A new National Strategic Plan for bovine JD has recently been endorsed. 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 5.

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 2: Herds/flocks with JD at 31 December 2003

	Cattle	Sheep	Goats	Deer	Alpaca	Total
NSW	143	710*	9	1	0	863
NT	0	0	0	0	0	0
QLD	0	0	0	0	0	0
SA	54	62	7	2	0	125
TAS	21	41	6	0	0	68
VIC	1119	147	7	7	2	1282
WA	0	1	0	0	0	1
AUS	1337	961	29	10	2	2339

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

Table 3: Herds/flocks with a JDMAP status of at least MN1/TN1 status at 31 December 2003

	Cattle	Sheep	Goat	Alpaca	Total
NSW	839	331	32	60	1262
NT#	0	0	0	0	0
QLD#	0	4	0	0	4
SA	285	248	20	36	589
TAS	112	34	1	1	148
VIC	387	153	6	36	582
WA#	0	0	0	0	0
AUS	1623	770	59	133	2585

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

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 31 December 2003

NSW	NT	QLD	SA	TAS	VIC	WA	AUS
797	0	54	489	102	623	138	2203

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 5 shows the number of dairy herds tested free of EBL at the end of the quarter.

Table 5: Dairy herds tested free of enzootic bovine leucosis at 31 December 2003

	NSW	NT	QLD	SA	TAS	VIC	WA	AUS
Free	1247	0	1058	516	679	6262	360	10 122
Herds	1252	0	1063	516	741	6340	360	10 272

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
Oct–Dec 02	69	0	3617	0
Jan–Mar 03	183	0	5133	0
Apr–Jun 03	157	0	1728	0
Jul–Sep 03	131	0	1646	0
Oct–Dec 03	181	0	4161	0
NSW	3	0	140	0
NT	0	0	1400	0
QLD	91	0	283	0
SA	0	0	1438	0
TAS	0	0	1	0
VIC	17	0	181	0
WA	70	0	718	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 8 summarises the national case register for bovine TB for the 14 years since 1990.

Table 7: Results of the National Granuloma Submission Program

	Granulomas submitted	TB +ve
Oct–Dec 02	1373	0
Jan–Mar 03	874	0
Apr–Jun 03	1297	0
Jul–Sep 03	1744	0
Oct–Dec 03	1672	0
NSW	96	0
NT	0	0
QLD	1,324	0
SA	84	0
TAS	8	0
VIC	33	0
WA	127	0

Table 8: National case register for bovine tuberculosis

	BTEC			BTEC - impending free					TFAP - free					
	90	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**00**	**01**	**02**	**03**
NSW	1	0	1	0	0	1	0	0	0	0	0	4[1]	0	0
NT	2	1	2	6	5	5	3[2]	4	2	1	0	0	2[2]	0
QLD	5	6	4	1	2	1	1	2	2[3]	0	2	3[1]	1[1]	0
SA	0	0	1	0	0	0	1	0	0	0	0	0	0	0
TAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VIC	0	2	1	0	0	0	1[3]	0	0	0	0	0	0	0
WA	0	0	0	1	0	1	1	1	1	0	0	0	0	0
AUS	8	9	9	8	7	8	7	7	5	1	2	7	3	0

Definitions: *Primary Cases* are those detected in *Case Herds.* A *Case Herd* is a herd in which a case of tuberculosis has been found, that was previously tested Negative, Monitored Negative or Confirmed Free 1, 2, or 3 (excluding *Secondary Case Herds*) as defined in the TB Standard Definitions and Rules (see www.aahc.com.au/tuberculosis/tfap2_sdrs.pdf). *Secondary Cases* are those detected in *Secondary Case Herds*. A *Secondary Case Herd* means a herd found to be infected with tuberculosis following tracing from a *Case Herd*.

[1] These Cases are secondary to the Case detected in Queensland in December 2000.

[2] Buffalo herd.

[3] One Secondary Case.

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 9).

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

Table 9: Notifications of zoonotic diseases in humans

Disease	Q4-02	Q1-03	Q2-03	Q3-03	Q4-03	Current quarter							
					AUST	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
Brucellosis[#]	11	5	8	4	3	0	0	0	2	0	0	1	0
Leptospirosis	25	33	46	21	28	0	6	3	11	1	0	4	3
Listeriosis	13	24	18	12	18	0	7	0	3	0	0	4	4
Ornithosis	33	27	31	69	65	0	26	1	0[nn]	1	0	37	0
Q fever	196	205	128	93	112	0	48	0	52	3	0	2	7

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 10 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 10: Number of animals tested under NTSESP (All were negative for TSE)

	Oct–Dec 02		Jan–Mar 03		Apr–Jun 03		Jul–Sep 03		Oct–Dec 03	
	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep
NSW	17	23	15	26	45	18	36	44	18	47
NT	6	0	1	0	7	0	7	0	8	0
QLD	71	31	39	4	49	8	49	7	38	2
SA	6	3	5	7	8	10	5	14	8	33
TAS	2	5	3	0	1	7	2	4	0	4
VIC	28	36	13	13	26	19	34	39	16	26
WA	9	36	7	35	1	15	15	27	8	28
AUS	139	134	83	85	137	77	148	135	96	140

PORTS SURVEILLANCE PROGRAM

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

Contact: David Banks, Biosecurity Australia, DAFF

Table 11: Number of inspections of insect trap sites

	Oct–Dec 02	Jan–Mar 03	Apr–Jun 03	Jul–Sep 03	Oct–Dec 03
Port surveillance					
Asian bees	12	16	12	15	10
Bee mites	27	31	30	15	14
Culicoides	34	35	32	31	32
Screw-worm fly	36	36	38	31	31
NAQS					
Screw-worm fly	53	108	108	108	108

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 11 and 12 summarise NAQS activity in Australia over the past five quarters.

Contact: David Banks, Biosecurity Australia, DAFF

Table 12: Summary of recent NAQS activity in Australia

	Oct–Dec 02		Jan–Mar 03		Apr–Jun 03		Jul–Sep 03		Oct–Dec 03	
	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve
Aujeszky's disease	197	0	53	0	235	0	34	0	117	0
Classical swine fever	197	0	53	0	235	0	34	0	117	0
Japanese encephalitis	210	0	362	17	169	0	197	0	48	9
Nipah virus	197	0	76	0	192	0	28	0	138	0
Porcine reproductive and respiratory syndrome	197	0	53	0	235	0	34	0	117	0
Surra	69	0	182	0	175	0	45	0	88	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. No further seroconversions have been recorded at the mainland sentinel pig locations.

AUSTRALIAN MILK RESIDUE ANALYSIS SURVEY

The Australian Milk Residue Analysis (AMRA) Survey is an independent monitoring program for agricultural and veterinary residues and environmental contaminants in raw cow's milk. The AMRA Survey is 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's 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 13 summarises the results for the quarter.

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

Table 13: Australian Milk Residue Analysis Survey, 1 October to 31 December 2003

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	4	0	0	0	2	0	0	0	2	0	8	0	0	0	16
Antimicrobials	0	34	0	0	0	20	0	14	0	14	0	194	0	12	0	288
Macrocyclic lactones	0	4	0	0	0	2	0	0	0	2	0	14	0	2	0	24
Organochlorines	0	0	0	0	0	0	0	0	0	2	0	12	0	2	0	16
Organophosphates	0	2	0	0	0	2	0	2	0	2	0	16	0	0	0	24
PCBs	0	6	0	0	0	4	0	2	0	2	0	38	0	0	0	52
Synthetic pyrethroids	0	6	0	0	0	4	0	2	0	2	0	38	0	0	0	52
Triclabendazole	0	6	0	0	0	4	0	2	0	2	0	38	0	0	0	52

NATIONAL RESIDUE SURVEY

Of 3405 samples tested during the quarter for agricultural and veterinary chemicals, there were two hormone residues and 21 metal detections. The results are summarised in Table 14.

The hormone residues were found in urine samples from a bovine animal, and a horse. The beef urine sample contained alpha-zeralanol (zeranol) of 0.003 mg/kg, beta-zeralanol (taleranol) of 0.004 mg/kg, and other zeranol metabolites, suggesting ingestion of *Fusarium* spp.-infected pasture or grain. No traceback was initiated. The horse sample contained alpha and beta 19-nortestosterone, at levels of 0.02 mg/L and 0.085 mg/L, respectively. These

residues are consistent with a urine sample from a male entire horse. As the residue levels exceeded the residue action limit (RAL) of 0.01 mg/L for alpha 19-nortestosterone and 0.001 mg/L for beta 19-nortestosterone, a traceback investigation has been initiated, but a report is not yet available.

Of the 21 metal detections found during the quarter, four were from sheep and the remaining 17 were from the minor species that have no Maximum Level (ML) set. Therefore, the detections were not violations, and were significantly below the established MLs set for cattle, sheep and pig. The four sheep detections were all of cadmium (1.3, 1.4, 1.6 and 1.7 mg/kg), exceeding the ML of 1.25 mg/kg but as they were below the Residue Action Level (RAL) of 2.5 mg/kg, no traceback was initiated.

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 14: National Residue Survey, 1 October to 31 December 2003
Each pair of figures gives the number of residues above the maximum residue limit or the maximum level and the number of samples tested.

	NSW		NT		QLD		SA		TAS		VIC		WA		AUS	
Anthelmintics																
cattle	0	49	0	0	0	62	0	9	0	8	0	25	0	10	0	163
pigs	0	8	0	0	0	2	0	4	0	1	0	7	0	3	0	25
sheep	0	112	0	0	0	3	0	52	0	1	0	51	0	37	0	256
other	0	9	0	0	0	5	0	6	0	0	0	6	0	4	0	30
Total	0	178	0	0	0	72	0	71	0	10	0	89	0	54	0	474
Antimicrobials																
cattle	0	90	0	1	0	105	0	21	0	9	0	57	0	10	0	293
pigs	0	26	0	3	0	20	0	14	0	0	0	32	0	17	0	112
sheep	0	139	0	0	0	3	0	76	0	4	0	65	0	76	0	363
other	0	8	0	0	0	5	0	1	0	0	0	7	0	3	0	24
Total	0	263	0	4	0	133	0	112	0	13	0	161	0	106	0	792
Growth promotants																
cattle	0	120	0	0	1	144	0	27	0	10	0	47	0	20	1	368
pigs	0	17	0	0	0	10	0	6	0	0	0	13	0	3	0	49
sheep	0	109	0	0	0	2	0	53	0	0	0	44	0	61	0	269
other	0	4	0	0	0	2	0	1	0	0	1	3	0	2	1	12
Total	0	250	0	0	1	158	0	87	0	10	1	107	0	86	2	698
Insecticides																
cattle	0	117	0	5	0	116	0	32	0	12	0	65	0	19	0	366
pigs	0	11	0	0	0	4	0	2	0	0	0	6	0	2	0	25
sheep	0	207	0	0	0	9	0	92	0	4	0	97	0	82	0	491
other	0	20	0	2	0	17	0	6	0	0	0	5	0	5	0	55
Total	0	355	0	7	0	146	0	132	0	16	0	173	0	108	0	937
Metals																
cattle	0	11	0	0	0	36	0	3	0	3	0	22	0	2	0	77
pigs	0	5	0	0	0	5	0	4	0	1	0	7	0	3	0	25
sheep	0	29	0	0	0	2	0	13	0	1	0	24	4	13	4	82
other	5	3	2	2	3	5	1	1	0	0	4	3	2	3	17	17
Total	5	48	2	2	3	48	1	21	0	5	4	56	6	21	21	201
Miscellaneous																
cattle	0	52	0	1	0	53	0	14	0	7	0	19	0	14	0	160
pigs	0	15	0	0	0	7	0	7	0	1	0	10	0	6	0	46
sheep	0	40	0	0	0	1	0	16	0	1	0	16	0	15	0	89
other	0	3	0	0	0	3	0	0	0	0	0	1	0	0	0	7
Total	0	110	0	1	0	64	0	37	0	9	0	46	0	35	0	302

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 15 summarises *Salmonella* isolations from animals notified to NEPSS for the quarter.

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

Table 15: Salmonella notifications, 1 October to 31 December 2003

Serovars	avian	bovine	canine	equine	feline	ovine	porcine	other	Total
S. Bovismorbificans	0	9	0	0	0	0	1	0	10
S. Dublin	0	42	1	0	1	0	0	0	44
S. Infantis	0	3	2	4	0	0	0	0	9
S. Typhimurium	1	41	1	10	0	2	0	2	57
Other	3	18	10	10	2	0	8	17	68
Total	4	113	14	24	3	2	9	19	188

SUSPECT EXOTIC OR EMERGENCY DISEASE INVESTIGATIONS

There were 22 investigations of diseases suspected to be either exotic or a possible emergency reported during the quarter, as shown in Table 16. More details about some of these investigations can be found in State reports.

Table 16: Exotic or emergency disease investigations reported from 1 October to 31 December 2003

DISEASE	SPECIES	STATE	MONTH	RESPONSE	FINDING
Anthrax	bovine	VIC	Oct	1	negative
Anthrax	bovine	VIC	Nov	1	negative
Anthrax	bovine	VIC	Dec	1	negative
Anthrax	bovine	VIC	Dec	1	negative
Anthrax	bovine	VIC	Dec	2	lead poisoning
Anthrax	bovine	VIC	Dec	2	negative
Anthrax	bovine	VIC	Dec	2	negative
Australian bat lyssavirus	fauna	TAS	Oct	3	physical injury
Avian influenza	avian	NT	Nov	3	septicaemia
Avian influenza	avian	VIC	Dec	2	infectious laryngotracheitis
Classical swine fever	porcine	SA	Dec	3	bacterial septicaemia
Foot-and-mouth disease	porcine	NSW	Nov	3	negative
Foot-and-mouth disease	bovine	NSW	Dec	3	negative
Foot-and-mouth disease	ovine	TAS	Oct	2	hereditary epithelial defect
Newcastle disease	avian	NSW	Oct	2	acute egg peritonitis
Newcastle disease	avian	NSW	Nov	2	negative
Newcastle disease	avian	VIC	Dec	2	botulism
Rinderpest	bovine	WA	Oct	3	negative
Screw-worm fly	ovine	NSW	Dec	2	*Calliphora* sp (probably *C.augur*)
Tropical canine pancytopaenia	canine	NSW	Nov	3	negative
Varroa mite	bee	TAS	Oct	1	*Braula coeca*
Vesicular stomatitis	equine	VIC	Oct	1	chemical irritant

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
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Animal Health Surveillance

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