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Animal Health Surveillance

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Preface

This issue includes an update on Australia's transmissible spongiform encephalopathy freedom assurance program, and information about the mid-term review of the second phase of the tuberculosis freedom assurance program. Additional articles describe the enhancement of Australia's foot-and-mouth disease (FMD) preparedness by new FMD vaccine bank arrangements, and by increased laboratory capacity for large-scale serological testing.

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. The AHSQ is available on the Animal Health Australia website (at www.aahc.com.au/nahis)

Gardner Murray
Australian Chief Veterinary Officer

TSE Freedom Assurance Program Update

The aim of the Transmissible Spongiform Encephalopathy Freedom Assurance Program (TSEFAP) is to 'enhance market confidence that Australian animals and animal products are free from TSEs through the structured and nationally integrated management of animal-related TSE activities.' Australia has never had a case of bovine spongiform encephalopathy (BSE).

TSEFAP integrates all TSE-related projects into one program with clear and nationally integrated operational components as follows:

- legislated ruminant feeding restrictions supported by compliance auditing and feed testing
- targeted TSE surveillance for ongoing demonstration of Australia's freedom
- imported ruminant surveillance, including the Cattle Tracing Scheme for certain imported cattle
- communication, including the production of advisory material for industry
- research and development.

RUMINANT FEEDING RESTRICTIONS

Australia has a ban on feeding ruminant animals with any material taken from vertebrate animals other than tallow, gelatin, milk products or oils extracted from poultry and fish. This ban includes meat and bone meal (MBM), blood meal and fish, poultry and feather meal. These are collectively known as restricted animal materials (RAM). The ban is compulsory under state and territory laws. Legislation is supported by a uniform national approach by state and territory authorities to compliance inspection and auditing of all parts of the

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ruminant feed production, marketing and use chain. Utilisation of sensitive laboratory techniques for detecting mammalian protein in ruminant feeds and precursor components assists with verification of compliance with regulations.

In 2004, more than 1150 operations were audited (from renderers to end-users). This resulted in 71 minor non-compliances, none of which required prosecution. The largest reason for non-compliance was due to the mislabelling of products. As a result of these minor non-compliances, a concerted education process has been incorporated into the activities of state and territory authorities ensuring that the different industry sectors understand their responsibilities.

NATIONAL TSE SURVEILLANCE PROGRAM (NTSESP)

The objectives of the program are to support trade by maintaining a TSE surveillance system which is consistent with the OIE Terrestrial Animal Health Code and assures all countries that import cattle and sheep commodities that Australia remains free of these diseases; and to protect public health by ensuring the early detection of TSEs should they occur in Australia's livestock so that an appropriate, early response can be mounted under AUSVETPLAN to protect the health of Australia's people and animals.

The NTSESP has an annual sampling intensity designed to be 99 per cent confident of detecting BSE or scrapie, if it is present in at least one case per million adult cattle or sheep respectively. This is achieved by the annual examination of a minimum of 400 cattle and 450 sheep brains, collected from animals showing clinical signs suggestive of a TSE. Additionally, a further 400 brains from downer animals are examined annually as part of the Prionics test accreditation process.

IMPORTED ANIMAL SURVEILLANCE

Cattle that were imported from countries that subsequently reported a BSE case are checked by relevant state and territory authorities on a six-monthly basis. The Australian cattle industry has funded the Cattle Tracing Scheme for cattle originating from these countries. Cattle are placed under lifetime quarantine and electronically tagged for identification and tracking in accordance with the National Livestock Identification Scheme. These cattle are not allowed to enter the human or animal feed chain, and are tested for TSEs when they die or are submitted by the owner for destruction.

RESEARCH AND DEVELOPMENT PROJECTS

A research and development program operates over a number of areas relevant to different aspects of animal TSEs. Some specific projects include:

- the maintenance of a national capability to undertake rapid BSE tests
- identification and critical analysis of suitable collection points for downer animals by state and territory authorities
- the transfer of testing capability from one jurisdiction to another in a short period of time therefore expanding the national capability
- the development and evaluation of tests for restricted animal materials in livestock feeds.

COMMUNICATION UPDATE

The major focus of the communication component of the TSEFAP has been the development of a specific animal TSE website for Australia. The website will incorporate all aspects of TSEFAP and provide updates on surveillance results and feed ban audits. Additionally, a number of industry-oriented extension items have been written and printed in the agricultural newspapers and relevant industry publications.

Contributed by: Duncan Rowland, Manager TSEFAP, Animal Health Australia and Reg Butler, OCVO, DAFF

Australian Biosecurity Cooperative Research Centre for Emerging Infectious Disease workshop

The inaugural national workshop of the Australian Biosecurity Cooperative Research Centre for Emerging Infectious Disease (AB-CRC) was held in Queensland on the Sunshine Coast, 22–24 November 2004.

The workshop brought together those involved with the AB-CRC, whether as a researcher, a member of one of the numerous committees, a representative of a partner organisation, or in an administrative role, to gain insight into the work of the Centre, and to build networks among the partners. This is particularly important as emerging infectious diseases raise complex problems that often rely on a combination of research and policy for efficient detection, control and eradication. The ongoing problem of human and poultry deaths in Asia from H5N1 avian influenza is an example of the importance of connections between researchers and policy makers. There was a very strong commitment shown by the 90 participants who attended two very full days.

The program included representation of projects from all three Research Program areas:

- Technologies to Enhance Detection
- Ecology of Emerging Infectious Diseases
- Advanced Surveillance Systems

The presentations were particularly valuable in that researchers and end users obtained an insight into the relationships between the AB-CRC's projects and Programs.

The panel for the session 'Disease Surveillance – where to from here?' consisted of representatives from the Australian Government Departments of Agriculture, Fisheries and Forestry (DAFF, Mike Nunn) and Health and Ageing (Moira McKinnon), Animal Health Australia (Simon Winter), AgForce Qld (John Stewart), Murdoch University (John Edwards), and AusVet Animal Health Services (Angus Cameron). Their diverse backgrounds and breadth of experience stimulated an interesting discussion.

There were also two symposia sessions, 'Avian influenza – past, present and future' and 'Future directions for the AB-CRC—where do the opportunities lie?'. The three speakers on avian influenza covered disease detection (Paul Selleck, Australian Animal Health Laboratory), disease emergence (Peter Black, DAFF) and disease surveillance (Angus Cameron, AusVet). The presentations highlighted the magnitude of the problem facing affected countries, the risk factors affecting the emergence and maintenance of avian influenza, and the surveillance challenges. There was a vigorous discussion on avian influenza surveillance in wildlife.

The final session, 'Future directions for the AB–CRC', was extremely entertaining and stimulating, courtesy of the presentation by David Banks (DAFF) on risk analysis, and Richard Whittington's discussion of food safety.

As this was an internal workshop, unfortunately it is not possible to make the proceedings of the workshop available. However, more information about the AB–CRC's research projects is available at www.abcrc.org.au.

Contributed by: Corinna Lange, Communications Officer, AB–CRC

National Arbovirus Monitoring Program

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

This report covers the second half of 2004, when arboviral activity in northern Australia is usually low. In the tropical regions of Western Australia, the Northern Territory and Queensland, there was an early start to the wet season followed by a period of above-average rainfall, especially in the Northern Territory. Drought conditions prevailed, or rainfall was low, in most districts in inland central and southern Queensland. There was severe drought throughout most of New South Wales over the whole year. There was a late onset to autumn, and winter was generally milder than usual, in most of Australia. Frosts in temperate regions were less frequent and minimum temperatures not as cold as usual. Neither seroconversions nor vector activity were detected in the southern States of Victoria, Tasmania and South Australia in the second half of 2004.

BLUETONGUE VIRUSES

Transmission of bluetongue viruses was observed in the endemic areas of far northern Australia and along coastal Queensland. There was evidence of continuing activity in the focus of bluetongue transmission in the Pilbara region of north-western Western Australia, with some transmission to the north. There was also an extension of the southern limit of spread in the Northern Territory and adjacent regions in far central western Queensland. In New South Wales, the Hunter region remains free of bluetongue infection. In the Northern Territory, types 1 and 21 were the only serotypes identified. There was no evidence of movement of more pathogenic viruses out of the far northern 'high risk' zone, and no evidence of the incursion of any new viral serotypes into Australia. There was no evidence of bluetongue viruses in proximity to any of the major sheep populations. Nationally, the areas free of bluetongue virus are slightly smaller this year, returning to limits observed in past years. However, all regions in southern Australia and most pastoral regions in eastern Australia remain free.

AKABANE VIRUS

Akabane activity was detected throughout the established vector areas in both northern and eastern Australia. In the Northern Territory, infection appeared to be less expansive and at a lower incidence, probably as a result of the extensive high incidence transmission during the previous year generating a high level of herd immunity. In northern Western Australia and the Northern Territory, transmission was more common during the dry season. In Queensland, virus transmission occurred along the coastal strip from the far north at Normanton and Cooktown but only as far

south as Rockhampton. Transmission was delayed and suppressed at sites further south, probably as a result of the prevailing drought conditions. However, late transmission was eventually detected in the far south, on both the coast at Beaudesert, and at inland areas in southern central Queensland. In New South Wales, transmission of Akabane virus was also influenced by the drought, with viral activity, generally at high prevalence, mostly confined to the endemic region. Infection was, however, detected on the northern New England Tablelands near the Queensland border and there was a low incidence on the northern slopes at Glen Innes. In the Hunter Valley, infection was less expansive than usual, with no evidence of transmission in the Upper Hunter region. There have been very few clinical cases reported, as most areas experienced a high incidence during the previous year.

BOVINE EPHEMERAL FEVER VIRUS

Ephemeral fever infections have been relatively patchy this year. There was normal spread at most locations in the endemic areas of northern Australia but the adverse weather conditions affected spread elsewhere. In Western Australia, infection was detected in the Kimberley region and in the west of the Pilbara. In the Northern Territory, there was activity in all sentinel herds except for the southern-most herd at Alice Springs and the herd at Rockhampton Downs. Seroconversions were restricted to coastal sites in north Queensland but late in the year there was activity at inland sites in central and southern central Queensland. In New South Wales, although the incidence was only moderate to low, infection was detected along the entire coastal plain south to Camden, in the Northern New England region and across most of the north-west slopes as far west as Walgett. This spread in north-west New South Wales and adjacent areas in Queensland is a consequence of the above-average rainfall in this area in the late summer. No seroconversions were recorded in the southern states.

VECTOR MONITORING

The distribution of vectors followed the normal pattern in most of Australia. In the eastern and western coastal areas of non-tropical and southern Australia, the main vector of interest is *Culicoides brevitarsis* and to a lesser extent, *C. wadai*. *C. brevitarsis* was found throughout the endemic area even in areas that were drought affected, although populations were reduced in size. In general, *C. wadai* was found less frequently than in previous years. In northern Australia no new vector species were detected.

There was again a close relationship between the arbovirus-free and vector-free areas of southern Australia, with the viruses less widely distributed than their vectors. The vector-free areas continue to undergo minor fluctuations, with a slight reduction in western Queensland and in the Pilbara region of Western Australia.

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

Tuberculosis Freedom Assurance Program 2 mid-term review

The Tuberculosis Freedom Assurance Program 2 (TFAP2) is a four-year program finishing in December 2006. Its objectives are to maintain Australia's free area status for bovine tuberculosis (TB), eliminate any cases of bovine TB that are detected, and prepare for the transition from a formal national program to future arrangements.

TFAP2 is supported by a Deed of Agreement between Parties (the Australian Government, state and territory governments, cattle industry and Animal Health Australia). The Deed specifies that a review is required mid-way through the program. To ensure the availability of results prior to the 2005 cattle season, the review was conducted in November by Dr Geoff Neumann and endorsed by the Animal Health Australia Board in December 2004.

In summary, the review identified that Australia's Free Area status for TB is being well maintained. The report identified the importance of being well prepared to manage any future cases of TB, should they occur. It was recognised that there had been no new cases of TB in cattle since 2000.

Feral buffalo were identified as a separate (but low) risk group, and additional surveillance activities are being planned to further demonstrate their TB free status.

Potential improvements to a number of administrative and operational arrangements were also identified in the review. These will now be considered by the TFAP2 Coordination Committee for implementation. These improvements will assist in preparing for the transition to Australia's future arrangements as assurance increases that TB is exotic to Australia.

Contributed by: Simon Winter, Program Manager, Animal Health Australia

New laboratory lifts capacity for emergency disease serology testing

An extension to the Queensland Department of Primary Industries and Fisheries Oonoonba Veterinary Laboratory in Townsville was completed in September 2004 and enhances Australia's capacity to undertake the large-scale serological testing that is associated with an exotic disease emergency such as an incursion of foot-and-mouth disease (FMD).

The outbreak of FMD in the United Kingdom in 2001 confirmed that a huge number of serological tests must be carried out, during and after the eradication of the disease, to assure trading partners that regional or country freedom has been attained. In the UK, several million animals were tested and the testing had to be outsourced to several laboratories in addition to their central FMD laboratory. Australia's Animal Health Laboratory in Geelong (Victoria) is well-placed to handle the initial diagnosis of an exotic animal disease, but in the event of a large-scale outbreak it is likely that serological testing will need to be outsourced to central and regional state laboratories.

New tests have been developed for the diagnosis of diseases such as FMD and BSE that do not rely on the use of live virus, and so can be carried out safely at a lower level of laboratory biocontainment. The Queensland government authorised $350 000 to extend the Oonoonba Veterinary Laboratory to provide modern facilities that could be used to undertake serological testing in an exotic disease emergency. To ensure there is no exposure to live FMD virus, the laboratory will not be used for testing of suspect cases of FMD. It is anticipated that Oonoonba's role in an exotic disease response will be in the post-outbreak surveillance phase, or as part of an active surveillance program to monitor populations and establish area freedom from an exotic disease.

The Oonoonba laboratory was built to a physical containment level 2 standard (PC2) and was designed to be able to carry out large-scale ELISA testing. It is made up of a large central laboratory and office accommodation for a pathologist and several technical staff.

Contributed by: Gary Horner, Oonoonba Veterinary Laboratory, Queensland Department of Primary Industries and Fisheries

New foot-and-mouth disease vaccine arrangements

In October, Animal Health Australia (AHA) announced the successful conclusion of a contract for the production, storage and supply of foot-and-mouth disease (FMD) vaccine for Australia with international animal health pharmaceutical company, Merial of France.

Australia has been a member of the International FMD Vaccine Bank (IVB) since 1985 and recently has reviewed the adequacy of the IVB arrangements. The IVB treaty was disbanded with the agreement of the eight member countries in June 2004, as the FMD vaccine produced by the IVB is no longer adequate to meet members' regulatory and strategic needs.

In March 2002, the Primary Industries Ministerial Council tasked AHA to broker a government/industry agreement to secure a commercial supply of FMD vaccine, based on policy and technical direction from the Office of Australian Chief Veterinary Officer, Animal Health Committee, and expert consultants. The supply contract, for antigen sufficient to provide 500 000 cattle-equivalent doses of each of nine FMD strains, is the end result of AHA's tender process and will cost Australia approximately $4 million over five years.

The supply contract guarantees delivery of FMD vaccine within seven business days of notification. The nine antigens have been selected to provide broad coverage against potential FMD threats and will be regularly reviewed.

The funding of the contract has been shared between the Australia Government, State and Territory Governments and peak industry bodies at a 40:40:20 cost sharing ratio, and represents a first for a government-industry partnership in funding an emergency animal disease vaccine bank.

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

Pooled prevalence calculator available on the internet

An epidemiological calculator for estimating disease prevalence from testing of pooled samples is now available on-line at www.ausvet.com.au/pprev/

Pooled (or group) testing is a testing strategy where samples from a number of individuals are aggregated into a single sample (or pool) and multiple such pools are then tested for the disease or agent of interest. Pooling of samples for testing provides one means of substantially reducing testing costs, without necessarily sacrificing precision of resulting prevalence or confidence interval estimates. Pooled testing for prevalence estimation is particularly useful where disease prevalence is likely to be low and where test-costs are high, relative to sample-collection costs.

Statistical techniques for estimating disease prevalence from testing of pooled samples have been developed and published in the scientific literature, but are computationally complex and therefore not widely used. This calculator provides a user-friendly interface for the implementation of a number of methods for estimating prevalence, assuming fixed or variable pool size and assuming either perfect tests or tests of imperfect and uncertain sensitivity and/or specificity. A Bayesian method is also included to allow incorporation of prior knowledge of the likely prevalence and of test performance. The calculator also includes options for estimating the required pool size and number of pools to be tested to achieve a desired level of confidence and precision when designing prevalence surveys and for simulated sampling to evaluate precision and potential bias of alternative pooling strategies.

The Pooled Prevalence Calculator provides an invaluable resource for researchers or epidemiologists undertaking disease surveillance involving prevalence estimation at the individual level (human, animal, aquatic animal, insects or plants) using pooled samples. The system also includes a comprehensive User Guide, Glossary and example analyses based on Hendra virus surveillance in fruit bats.

The on-line calculator was developed by Dr Evan Sergeant from AusVet Animal Health Services, with funding from the Australian Biosecurity Cooperative Research Centre for Emerging Infectious Disease (www.abcrc.org.au).

Contributed by: Evan Sergeant, AusVet Animal Health Services

Aquatic animal health

ASIA REGIONAL STRATEGY MEETING

Recently, representatives from the Office of the Chief Veterinary Officer (OCVO) within the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) attended the three-day Asia Regional Advisory Group on Aquatic Animal Health meeting at the headquarters of the Network of Aquaculture Centres in Asia Pacific (NACA) in Bangkok. The Advisory Group has been established and operational under NACA since 2001. It is a core group of experts advising NACA on its aquatic animal health management programme. The 10-member high level Advisory Group, constituted by NACA, in cooperation with OIE and FAO, advises Asian governments on aquatic animal health management. During its annual meetings, the AG addresses key aquatic animal health issues in Asia, including regional disease reporting systems, emerging aquatic animal disease problems, implementation of the Asia Regional Technical Guidelines (TG) on Health Management and the Responsible Movement of live aquatic animals, and ways to further strengthen regional and international cooperation in Asian aquatic animal health management.

Opportunities were discussed at the meeting for collaboration with NACA in respect to aquatic animal health emergency preparedness and disease response. A proposal was presented by OCVO for a five-stage initiative where the Australian experience in emergency preparedness can be used to improve regional capability. The initiative includes measures such as the modification of AQUAVETPLAN as a regional resource, and the development of general biosecurity principles.

The meeting also discussed reviewing the aquatic animal health situation in the region, revision of the Quarterly Aquatic Animal Disease (QAAD) reporting operated by the OIE Regional Representation and NACA, and regional cooperation with respect to aquatic animal health management.

AQUATIC ANIMAL HEALTH COMMITTEE MEETING

Aquatic Animal Health Committee held its 5th meeting on 3rd November in Fremantle, Western Australia. Some of the key issues discussed were:

- The endorsement of the AQUAVETPLAN Disease Strategy Manual on Viral Encephalopathy and

Retinopathy by the Primary Industry Standing Committee. The manual is now available on the DAFF website (at www.daff.gov.au/aquavetplan).

- The draft guidelines on welfare of fish and crustaceans in aquaculture and/or in live holding systems for human consumption were tabled. The Committee were highly complimentary of the draft guidelines, and undertook to provide comments to the authors.
- An update on the OIE Aquatic Animal Health Standards Commission meeting in October 2004 was presented. Key issues included the harmonisation of the structure of disease chapters for future editions of the Aquatic Animal Health Code and suggested revisions to the list of diseases under the Code.
- Registration of chemicals for use in aquaculture was discussed. An issues paper will be developed and a one day workshop will be held to advance issues of chemical registration for aquatic animals.
- Changes to Australia's National List of Reportable Diseases of Aquatic Animals were endorsed by the Primary Industry Standing Committee. The Committee noted that reporting this revised list will commence with the October–December 2004 quarter. The updated list can be found at under the Disease Reporting link on the internet (at www.daff.gov.au/aquaplan).

AQUAPLAN FUNDING WORKSHOP

Aquatic Animal Health Committee held the AQUAPLAN Funding Workshop in November 2004 in Fremantle, Western Australia , with representatives from governments and industry, to consider the budget for *AQUAPLAN 2005-2010*.

Committee members confirmed that a national strategic plan for aquatic animal health was essential and that the Committee would be the manager and driver of *AQUAPLAN 2005-2010* and its implementation. The workshop provided the Committee with an opportunity to reassess *AQUAPLAN 2005-2010* projects in terms of their strategic importance and expected and required outcomes. A number of projects were reprioritised and revised to ensure that they would produce the desired outcome and contribute to the continued protection of aquatic animal health within Australia. The *AQUAPLAN 2005-2010* strategy document will be revised to take into account this reprioritisation.

The revised *AQUAPLAN 2005-2010* will be presented to Primary Industry Standing Committee and the Primary Industries Ministerial Council at their meetings in March and April 2005. If endorsed, the plan will be officially launched in July 2005.

Further information on *AQUAPLAN 2005-2010* and its predecessor *AQUAPLAN 1998-2003* can be found on the internet (at www.daff.gov.au/aquaplan).

STANDARD DIAGNOSTIC PROCEDURES FOR SPRING VIRAEMIA OF CARP

As reported in *AHSQ* (see Vol 9, No. 3), the review process for new standard procedures has been formalised to ensure the timely production of new Australian and New Zealand standard diagnostic procedures (ANZSDPs). In December 2004, the Sub-Committee on Animal Health Laboratory Standards (SCAHLS) endorsed a new aquatic ANZSDP for spring viraemia of carp, as well as a policy document *Principles for the design and conduct of surveys to show presence or absence of infectious disease in aquatic animals*. ANZSDPs that have been endorsed by SCAHLS, as well as those that have been endorsed by the National Aquatic Animal Health Technical Working Group and submitted to SCAHLS, can be found on the internet (at www.daff.gov.au/aquaticanimalhealth).

Contributed by: Nathan Rhodes, OCVO, DAFF

Australian Wildlife Health Network

The Australian Wildlife Health Network (AWHN) receives reports of wildlife incidents, and definitive diagnoses of cause of death, in wildlife in Australia. The Network appreciates and acknowledges the contributions from organisations and individuals that have been received. All contributions are recorded in the AWHN database (the Wildlife Health Information System: WHIS), with details about selected incidents provided here. For information on other cases, contact the Network at awhn@zoo.nsw.gov.au.

The Network is undergoing a review period prior to its next phase of operations. This includes an independent major milestone review, and a review of its strategic and business plans based on the needs identified by the national community. A summary of the main findings of the major milestone review will be included in the next edition of *AHSQ*.

Network activities remain focussed on surveillance, investigations, and the provision of information to managers and field staff to help support trade, human health and biodiversity. In addition, the transition from a largely reactive, paper-based information management system to a more pro-active, web-enabled, electronic system that operates in close-to-real-time (eWHIS, the web-enabled version of the

Wildlife Health Information System) is being progressed. This system will be operational early in 2005.

FREE-RANGING WILD ANIMALS

In NSW, six birds were examined from the many short-tailed shearwaters (*Puffinus tenuirostris*) that died following their annual migration. One bird had large intranuclear inclusion bodies in the kidney, which may indicate the presence of an underlying viral infection.

A post mortem examination was performed on a green turtle (*Chelonia mydas*) from NSW that died after two weeks of treatment for depression, anorexia, and weakness of the right hind flipper. There were lesions in the brain attributed to the extra-intestinal stages of a coccidian parasite (*Caryospora* sp.). In addition, evidence of cerebrovascular fluke worms was found, and the turtle had pneumonia. Two other turtles from the Port Stephens area had systemic coccidiosis (*Caryospora cheloniae*). The infecting organism was responsible for significant green turtle mortalities in October of 2002 and 2003, but these are the only three cases known to have occurred in 2004.

Two adult white-bellied sea eagles (*Haliaeetus leucogaster*) found dead at Homebush Bay in NSW were found to have dioxin in their tissues at sixty times the level considered harmful to birds. These environmental contaminants can produce central nervous disease, tumours and death, and are believed to have contributed to the deaths of these birds.

Thirty-five of 37 oblong tortoises (*Chelodina oblonga*) died, and the remaining two were euthanised, within weeks of their removal from a Western Australian lake that was to be drained for development purposes. The euthanised tortoises both had a superficial fungal epidermitis, and heavy growths of the bacterium *Citrobacter braakii* were recovered from multiple organs of one tortoise. It is thought that the animals may have become immunosuppressed after their capture and subsequently succumbed to opportunistic pathogens.

CAPTIVE WILD ANIMALS

Mycobacterium intracellulare (*M. avium* group) was isolated from a lame 'little penguin' (*Eudyptula minor*) from NSW.

A platypus (*Ornithorhynchus anatinus*) from NSW has had wart-like lesions (papillomas) under the front toenails for over a year. Papilloma or herpes viruses are possible causes, and chronic irritation or trauma has probably contributed to the lesions.

BAT VIRAL DISEASES

Twenty bats were tested for Australian Bat Lyssavirus during the quarter. One animal, a fruit-eating bat from NSW, was positive.

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

State and Territory reports

New South Wales

Contributed by:
Barbara Moloney
NSW Agriculture

ANTHRAX

There were six confirmed anthrax incidents during the quarter. All six incidents were isolated, although one occurred on a Condobolin property neighbouring an incident reported in the previous quarter (see *AHSQ* Vol. 9, No. 1). Two incidents occurred in October, one in Narrandera and the other in Condobolin (adjacent to previously reported incident). Both October incidents involved sheep, with five deaths on each property. The third incident for the quarter occurred mid-November in the Nyngan District, where 13 of 220 beef cattle died. The remaining three incidents occurred in December, one in each of Narrandera, Condobolin and Nyngan districts. Sheep deaths occurred in Narrandera (5) and Condobolin (20), and two beef cattle died in Nyngan during December. The three affected districts are located in the known endemic anthrax area of NSW. In all cases, departmental policy for anthrax was applied. Properties were placed in quarantine, carcases were burnt or buried, sites disinfected and in-contact animals vaccinated. One property had some potentially exposed cattle sold to slaughter, but investigations by AQIS determined that there was no compromise to certification. Additionally, epidemiological investigations on the property found that the cattle sold would have had a minimal risk of incubating anthrax.

Six other investigations during the quarter were negative for anthrax, three in each of sheep and beef cattle. Arsenic toxicosis was diagnosed in one of the cattle investigations (see Arsenic Toxicosis item in this issue).

ARSENIC TOXICOSIS IN CATTLE

In November, six of 18 Hereford heifers on a Lismore district property died suddenly. Initially, anthrax was suspected but excluded by laboratory testing and the property being well distant from the known anthrax endemic area. On-property investigations revealed that the cattle had recently gained access to an old shed containing unlabelled chemicals. Subsequent laboratory testing confirmed arsenic toxicosis as the cause of death, with liver levels of 32 mg/kg in one affected animal. Chemical and nearby soil samples were positive for arsenic. Ten of the remaining 12 heifers were clinically affected by arsenic, showing ataxia, stilted gait and minimal (if any) scouring. Two of the affected animals subsequently died. The owner was advised to prevent any further access to arsenic by the surviving animals, and not to send them to slaughter for at least 72 days.

AVIAN TUBERCULOSIS IN A SLAUGHTERED PIG

During the quarter, avian tuberculosis was confirmed by culture at Western Australia Animal Health Laboratories, in a granuloma from a pig. The animal was one of 100 pigs slaughtered in August and originated from the Armidale district. Inspectors detected granulomas in its bronchial and mesenteric lymph nodes.

INFECTIOUS LARYNGOTRACHEITIS IN POULTRY

A respiratory illness in backyard poultry from the Tweed-Lismore district was confirmed as infectious laryngotracheitis in November by post mortem and histopathological examinations.

CHLAMYDIOSIS IN BIRDS

Chlamydiosis was confirmed in three related broiler farms south-west of Sydney in November. Clinical presentation included conjunctivitis and increased mortalities. Gross post mortem examination showed peritonitis, and chlamydiosis was confirmed by immunofluorescent antibody testing (IFAT) on smears of affected organs. On one of the farms, birds were close to processing date and medication was not practical. The consumption of meat from sub-clinically infected birds is not known to pose any risk to public health. The risks to employees during processing are controlled with appropriate protective clothing and equipment and reinforcement of personal hygiene. Additional precautions include covering loads during transport, and special attention to rejection of sick, septicaemic birds or any bird with systemic lesions.

Chlamydiosis was diagnosed in a number of wild parrots and rosellas found dead in a backyard of a semi-urban subdivision in the Moss Vale district. Birds were in poor condition with diarrhoea. About 30 were reported to have died during a two-month period. Chlamydia IFAT was positive on spleen and liver, and histopathology was consistent with chlamydiosis. Two aviary parrots from outer Sydney also were diagnosed with chlamydiosis.

COPPER POISONING IN SHEEP

The combination of exposure to pyrrolizidine alkaloids from Paterson's Curse or heliotrope (causing liver damage) and the accumulation of copper, has seen a resurgence of the seasonal problem of secondary copper poisoning ('toxaemic jaundice' complex) and high mortalities in sheep across the southern region of NSW. Typical supporting evidence includes acute pathological changes in liver and kidney, high liver copper levels and mortality rates between 2% and 13%. The problem has been seen across the Rural Lands Protection districts from Gundagai and Temora in the east to Finley, Berrigan and Deniliquin in the west. Most of the cases were seen in November.

Although the haemolytic crisis is predominantly due to grazing plants containing pyrrolizidine alkaloids, mechanisms exist in which liver cells are damaged and store excessive amounts of copper. When animals are subjected to stress these damaged cells release the copper and result is massive haemolytic effects and rapid death. Another causative factor is the relationship with dietary molybdenum, where a deficiency in this element can allow an increased availability of copper. This can occur with clover-dominant pastures as was seen in Gundagai where the mortalities reached 13%.

MYCOPLASMA OVIS IN THE FAR WEST

Mycoplasma ovis (formerly *Eperythrozoon ovis*) killed three 4-month-old merinos and caused severe lethargy and depression in many more lambs near Pooncarie, in the far west of NSW. The owners reported slow recovery from mulesing, a higher-than-normal rate of post-mulesing flystrike, severely depressed lambs with anorexia and reluctance to move. Lambs examined were febrile, displayed mucous membrane pallor, tachypnoea, tachycardia, and had jaundiced serum. *Haemonchus contortus* and toxic plants were ruled out by flock faecal tests, pasture examinations, and blood testing. Blood smears, haematology, biochemistry and post mortem findings confirmed the diagnosis of *M. ovis*. Recommendations regarding good nutrition, limiting other co-stressors (such as intestinal parasites) and not moving lambs during an outbreak were given. This was an interesting finding as *M. ovis* is not commonly diagnosed in this far western region.

ERYSIPELOTHRIX POLYARTHRITIS IN LAMBS

Six per cent of a Merino lamb flock from the Condobolin district were reported to be affected by

arthritis in one or more joints. Lambs were born during the eight weeks from early May 2004. Marking and mulesing was carried out by a registered contractor in mid-July. They were vaccinated with a 6-in-1 vaccine, and tails were docked with a hot knife. Lambs were weaned and drenched in late August. The lambs were weaned onto self-sown oats and had access to barley in self-feeders. A number of lambs were noted to be lame at weaning. During the next two months, more lambs were seen to be lame on one or more legs with concurrent loss in body condition.

Nine affected lambs were examined on two occasions in November and December. Multiple joints were affected including hocks, stifles and carpi. Rectal temperatures were variable with three out of nine being 40 ºC on both examinations, but the significance of this is questionable due to high ambient temperatures. Sera from all nine lambs tested negative for chlamydia using a complement fixation test. A post mortem examination was performed on one lamb. Synovitis was noted in three of the four hock and stifle joints. Chlamydia tests carried out on the four joints and serum were negative. *Erysipelothrix rhusiopathiae* was cultured from all four joints.

POLIOENCEPHALOMALACIA IN DAIRY HEIFERS

Polioencephalomalacia was responsible for the deaths of seven of 38 six- to eight-month-old heifers at a Camden area dairy herd in December. Heifers were found dead or dying over a short period of time. The clinical signs included staggering, shaking, lameness, opisthotonos, and blindness, with death occurring within three days from the onset of signs. A post mortem examination was performed on a fresh carcase. The gross findings included petaechial epicardial haemorrhages, pale liver, patchy ecchymotic haemorrhage well-distributed through the ileal mucosa, and some dark red-brown loops of colon with severely haemorrhagic mucosa. The laboratory results included high urea and albumin levels, and low protein and globulin levels. The histopathology results included some minor liver and kidney changes. Severe autolysis was present in the ileum and some suppurative crypt abscesses was present in the small intestine. The mesenteric lymph node had multiple foci of severe autolysis associated with bacteria. The rostral brain stem and hippocampus had no significant findings. The occipital cortex outer layers were extensively and severely rarefied with definite regional malacia with perivascular cuffs, macrophages (gitter cells), acute neuronal necrosis and vascular proliferation. The cortical margins corresponding to older lesions with gitter cells fluoresced very brightly when examined under the Wood's lamp. The findings were typical of polioencephalomalacia. A common cause of this disease is thiamine deficiency but there are many cases where no cause is found.

Northern Territory

Contributed by:
Dick Morton
DBIRD

HEAT STRESS IN COMPROMISED LAYER HENS

The manager of a commercial egg producing farm reported the deaths overnight of 136 birds. The deaths were mainly in two lines of birds aged from 34 and 42 weeks housed in one of three sheds on the farm. The deaths occurred during the hottest night of the build-up to the wet season when there are high humidity and temperatures, even at night. Fans and misters were operational, and water supply was good. The birds were examined at the farm. Clinical signs in survivors included, pale droopy combs, depression, recumbency, gaping, and diarrhoea. The manager reported that egg production was lower in these lines, and many had thin shells. Post mortem examinations were performed at the Berrimah Veterinary Laboratory on twelve birds (six found dead, six euthanised).

Samples were sent to the Australian Animal Health Laboratories (Geelong) for exclusion of avian influenza and Newcastle disease. Post mortem examinations revealed two distinct groups of diseased birds. Birds from the first group were fat and unproductive, while those from the other group were thin and pale. Gross pathology and histopathology of the thin birds indicated avian leucosis. The manager reported that at the start of previous build-ups to the wet season, mortalities (presumably due to heat stress) increased, with fat birds being the most affected. It was concluded that the deaths were caused by heat stress, with fat birds and those affected by avian leucosis being the most susceptible.

BOTULISM IN GUINEA FOWL AND TURKEYS

The manager of a rambutan orchard reported deaths in 15 of 100 guinea fowl and three of five turkeys. The property was visited and 20 guinea fowl showed classical symptoms of botulism, with flaccid paralysis of legs, wings, neck and eyelids. Most affected birds had varying degrees of lameness and paralysis. The birds were confined in the fully enclosed orchard. Ducks and geese appeared normal. At five sites there was fly-blown decaying meat and offal. The manager explained that flies were being farmed to pollinate the fruit due to the low bee population. Botulism toxin is known to be concentrated in maggots. Post mortem examination revealed no macroscopic lesions but some birds had maggots in the crop. Mouse bioassay was performed at the Berrimah Laboratory and *Clostridium botulinum* toxin type C was identified. It was concluded that this was another case of botulism in poultry.

Queensland

Contributed by:
David Pitt
QDPI&F

BOVINE EPHEMERAL FEVER

Bovine ephemeral fever (BEF) virus was detected by polymerase chain reaction (PCR) test in two animals showing clinical signs. One was a 30-month-old male animal on a property in Banana Shire, and the second was a two-year-old steer on a property in Fitzroy Shire. There were numerous other unconfirmed reports of BEF in beef herds throughout central Queensland during the quarter.

SPORADIC BOVINE LYMPHOSARCOMA

Sporadic bovine lymphosarcoma caused the death of an 18-month-old Murray Grey heifer from a herd of 19 near Woodford. The animal had grossly enlarged superficial lymph nodes and had shown lameness and weight loss over the eight weeks prior to death.

BOTULISM

Thirteen Brahman cattle died from a herd of 300 in the Bowen Shire. They appeared alert, ate and drank satisfactorily, but could not rise after lying down. Death followed four to six days later. The pastures were short, dry, and of poor nutritional value. Intestinal samples collected by the owner tested positive for *Clostridium botulinum* toxin type C and D.

VITAMIN A DEFICIENCY

A loss of almost one third of calves in a breeding herd in McKinlay Shire has been attributed to Vitamin A deficiency, with heat stress being a contributing factor. Most calves died within 48 hours of birth. Those that were found early showed difficulty sucking, sluggish mentality and apparent blindness. Others that survived longer were found to have thickened carpal joints, in-coordination and a mild tremor. Liver and blood levels of Vitamin A were markedly low (or undetectable) in all calves examined. Herd health investigations for low fertility indicated that maiden heifers were deficient in both vitamins A and E. The area was in drought conditions with no green feed.

ACIDOSIS

A property in Banana Shire lost 15 from 800 mixed-age cattle over a two-week period. Affected cattle were being fed grain from self-feeders in paddocks. Clinical signs included lameness, dehydration, recumbency and death. There were no obvious signs of scouring, and no major pathological changes noted in five necropsied animals. D-Lactate levels from the aqueous humour of three animals were markedly elevated, which, considered with history and clinical signs, make lactic acidosis the likely diagnosis. The mortalities in this case were elevated because the producer was reluctant to change his management practices, despite being aware of the risks. A total absence of paddock feed made the cattle totally reliant on grain. The major grain component in the ration had been changed from sorghum to barley just before the deaths began.

POISONINGS

Lead poisoning caused the deaths of three of 60 weaner cattle near Kingaroy in south-east Queensland. Clinical signs of tachycardia, pale mucous membranes, decreased ruminal sounds, lethargy, and recumbency were seen. Liver contained 11.50 mg/kg FW of lead.

PLANT POISONINGS

Cylindrospermopsis spp. (toxin-producing blue–green algae) are believed responsible for severe hepatopathy, nephropathy and death in nine of 300 eighteen-month-old cattle on a property in the Broadsound Shire. A further 25 animals were sick, with signs of emaciation, jaundice and weight loss. Pathology from three animals was consistent with cylindrospermopsis toxicity and *Cylindrospermopsis* spp. were found in samples of stock drinking water.

Investigations were conducted on two neighbouring properties in Thuringowa Shire, north Queensland, after deaths occurred in botulism-vaccinated 30-month-old Brahman heifers in good condition. They were recumbent, and although they would get up when encouraged, they were reluctant to move and showed hind limb ataxia. At post mortem examination, findings included enlarged livers and significant pericardial fluid. Liver changes were suggestive of a toxic insult, but did not indicate a particular agent. Peracute myocardial necrosis was detected on histology. This is commonly associated with cardiac glycoside intoxications. Rubbervine (*Cyryptostegia grandiflora*), a major source of nutrition on both properties, contains cardiac glycosides. Both owners moved their cattle to other properties and no further deaths occurred. Testing for bovine ephemeral fever (PCR test), *Clostridium botulinum* toxin types C and D, and organisms for tick fever were negative.

The rush *Juncus continuus* was suspected to be responsible for the death of a three-year old Friesian cow in Tiaro Shire in late September. The cow was one of 10 affected from 25 that had access to a paddock usually empty of animals. There was evidence of local irritation of the mouth, diarrhea, and heart failure, consistent with plant poisoning.

TRANSIT TETANY IN SHEEP

High mortality in a flock of sheep in Ilfracombe Shire has been reported (100 dead from 2000). The flock had

been mustered seven kilometres into a laneway in preparation for crutching. Two days later, many of the lambs (several months old) were recumbent or dead (without signs of struggle). Three of the lambs were treated with commercially prepared intravenous calcium and phosphorus solution. Two recovered. The other lamb improved, but did not get up. Necropsy showed multifocal pulmonary oedema and interstitial haemorrhage consistent with transit tetany.

PIGS

Enterotoxaemic colibacillosis caused the deaths of 30, and sickness in 100, of 300 seven- to ten-week-old pigs in a piggery in Boonah Shire in November. Severe diarrhoea was observed prior to death, and several animals showed neurological signs. Pigs submitted for post mortem examinations had distended small and large intestines, with watery contents containing clots of mucus and fibrin. Brains from two animals showed vasculitis. Blood vessels, particularly those in the brainstem, showed fibrinoid necrosis of the walls and a variable inflammatory response involving both neutrophils and mononuclear inflammatory cells.

Six piglets died, and 60 were sick, from 3000 piglets aged 41 to 44 days on a large Darling Downs piggery. About a third of the pigs had had scours over the previous two weeks. All pigs autopsied had necrotic enteritis of the colon, and two pigs also had bronchopneumonia. On histological examination, there was ulcerative colitis. Silver stains of the colon showed spirochaetes consistent with *Brachyspira* sp.

GOATS

Mycoplasmosis (*Mycoplasma capricolum)* caused the death of one of 12 three-month-old goats in Nanango Shire in late October. Clinical signs of respiratory distress and purulent nasal discharge were followed by pyrexia and swollen joints.

POULTRY

Chicken anaemia agent syndrome was suspected to have caused the deaths of 250 of 55 000 twelve-day-old broilers on a farm in south-east Queensland. Birds were gasping for breath prior to death. Bone marrow hypoplasia was found on histological examination.

Sudden death syndrome and Vitamin E deficiency were presumed to have caused the deaths of 2600 of 13 000 four-week-old broilers on a farm in south-east Queensland. There were no histological lesions consistent with Vitamin E deficiency, but both feed and liver samples appeared to be deficient.

There were nine deaths, and two more were sick, in a flock of 18 silky poultry hens in November near Oakey. Losses occurred over 10 days, and fowls showed gasping and noisy respiration and depression. Infectious avian laryngotracheitis (ILT) virus was isolated from tracheal tissue on autopsy.

South Australia

Contributed by:
Celia Dickason
PIRSA

MELANOMAS IN DAIRY CATTLE

Two dairy heifer yearlings at a market near Strathalbyn were found to have large tumours on their flanks. The tumours were dark, crusty, pedunculated spheres of up to 10 cm in diameter. Post mortem examination was performed, and dark foci were noted throughout the tissues in both carcasees. Histopathology of the tumours revealed very similar lesions in both animals. There were bundles of spindle cells, randomly interlaced with nests of epithelioid cells. The cytoplasm contained melanin and there were numerous macrophages containing melanin. Melanoma was diagnosed in both animals. Of interest in this case was the young age of the cattle as well as the fact that they were genetically related and originated from the same property.

TWO CASES OF POLIOENCEPHALOMALACIA

Two animals (one sheep and one dairy cow) submitted as part of the National Transmissible Spongiform Encephalopathy Surveillance Program (NTSESP) were diagnosed with polioencephalomalacia (PEM). Both tested negative for TSEs. The sheep was submitted from a mid-north sheep property that had had multiple deaths within a few days. Affected animals were down on their front limbs, had no flight response, were docile and appeared disoriented. One animal was euthanised and a post mortem examination performed. Brain histopathology showed laminar necrosis and malacia, consistent with PEM. The second animal was a dairy cow from Mount Compass, which had developed ataxia and blindness, despite normal blood calcium and magnesium levels. This progressed to ataxia and blindness within 72 hours, and the cow was euthanised. Histopathology revealed cortical pyknosis of small neurons, laminar vacuolation and focal haemorrhage in the thalamus and midbrain. This is consistent with PEM. Polioencephalomalacia is most commonly caused by thiamine deficiency, but other causes include lead toxicity and excessive sulphur.

HYDATIDS IN SHEEP

PIRSA confirmed that samples submitted by AQIS staff at the Port Pirie abattoir were fertile hydatid cyst lesions (larval *Echinococcus granulosus*). Cysts were found in three of 191 homebred ewes sourced from a property located on the Eyre Peninsula approximately 15 km north-west of Port Lincoln. The carcases were severely affected, with multiple cysts present in lungs and livers, some measuring up to 4 cm in diameter. Larval lesions of *Taenia ovis* and *T. hydatigena* were also present throughout these sheep. The producer was

notified and advised about the zoonotic implications and management of this condition.

HIGH MORTALITY IN LAYERS

A phone call was received through the Emergency Disease Hotline, reporting 90 per cent mortality in an Adelaide inner suburban back yard flock of mature laying birds. The owner expressed concern about avian influenza and insisted that the birds showed no signs of trauma. Five dead birds were submitted for post mortem examination. All had multiple teeth marks over the body and four had broken necks. It was suggested that the cause was either a fox or dog attack, more likely the former as the birds were confined behind high wire, and foxes are more likely than a dog to climb fences. The deaths have since ceased.

INCLUSION BODY HEPATITIS IN YOUNG MEAT-STRAIN CHICKENS

Assistance was requested by a small commercial meat chicken enterprise near Virginia that had severe depression in up to 10 per cent of birds from the last few flocks. A number of birds were exhibiting paresis and torticollis and the death rate was about 5 per cent, with deaths beginning at two weeks of age and persisting for a week. Post mortem examinations of dead and comatose birds revealed the presence of pale, enlarged livers with some ecchymotic haemorrhages. Bursae appeared to be within the normal size range. The diagnosis of inclusion body hepatitis was based on age, and clinical and necropsy signs.

'SPOTTY' LIVER SYNDROME IN CAGED LAYERS

The Australian egg industry has been concerned for some years by a syndrome in barn and free range layers where, as they approach peak lay, there is an onset of increased mortality in association with the finding of white to pale yellow miliary lesions throughout the liver. Microscopically, the lesions are focal hepatocellular necrosis with variable degrees of inflammatory cell invasion. Culture of tissues usually fails to produce growth of any organisms. There has been a lull in reporting of this syndrome for over a year, but in the last few months it has occurred again. Of additional interest is that it has now also been seen twice in commercially housed caged layers, with clinical and necropsy findings identical to the syndrome seen in the floor-housed birds. Investigations are continuing.

INFECTIOUS LARYNGOTRACHEITIS IN SHOW BIRDS

Birds kept for exhibition by students at an Adelaide high school were examined because of deaths associated with a severe respiratory illness. Birds were noted to be gasping when breathing and many were dying. Necropsy indicated the presence of diphtheritic lesions typical of infectious laryngotracheitis in the trachea. Further investigation revealed that the problem started about a week after the return of birds from the Adelaide show. The first birds affected had been those attending the show, suggesting infection may have been contracted at the show and brought back to the school by the shown birds.

CALICIVIRUS IN A RABBIT

A case of sudden death was reported in a rabbit at Murray Bridge. The six-month-old New Zealand White doe gave birth to a litter of kittens, and vulval bleeding was noted the following day. The doe was found dead two days later. Post mortem examination revealed that the liver and kidneys had decomposed rapidly. A wide range of samples was submitted for examination. The major lesion at histopathology was pronounced zonal coagulative hepatic necrosis, with advanced primary foci. Lymphoid infiltration was noted in the liver, and also in the spleen and small intestine. The most likely cause of necrotising hepatitis in a six-month-old rabbit is caliciviral infection, especially as this animal was unvaccinated. A vaccination course for young rabbits, followed by an annual booster, is recommended to prevent this disease.

Tasmania

Contributed by:
John Elliott
DPIWE, Tasmania

TOXOPLASMA ABORTIONS

About 15 abortions occurred in a flock of 400 ewes over four weeks. Six lambs were submitted for examination. Four of these had positive toxoplasma titres. One lamb, which was toxoplasma negative, showed signs of dystocia. No other abnormalities were detected. Toxoplasma appears to have been involved in a large proportion of these abortions. The ewes had been fed silage that had been brought onto the farm. After examination of the silage, it was considered highly likely that it had been contaminated by cat faeces. Control of farm and feral cats will reduce the occurrence of toxoplasmosis on a farm but buying in feed contaminated with cat faeces, especially from young cats, can re-introduce infection.

SUSPECTED EQUINE HERPESVIRUS ABORTION

A mare aborted on a stud in northern Tasmania about one month after coming from Victoria. A blood sample taken immediately after the abortion had a positive EHV titre of 1:512. A second blood sample was taken about five weeks later. The titre had dropped to 1:355, suggesting that EHV was not the cause of the abortion.

CAMPYLOBACTER IN HORSES

Campylobacter sp. was cultured from a mare and foal diagnosed with salmonellosis after the same *Salmonella* serotype had been cultured from their owner. *Campylobacter* sp. is not commonly found in cases of equine diarrhoea in Australia, but has been reported in foals with chronic, intermittent diarrhoea in the UK, USA and NZ. Pathology was not always reported, but intestinal adenomatosis and granulomatous enteritis were seen. Laboratories in Australia may not routinely culture for *Campylobacter* in horses. It may need to be considered, however, when investigating equine diarrhoea.

STREPTOCOCCOSIS IN FISH

Streptococcus agalactiae has been cultured from fish for the first time in Tasmania. Samples were submitted as part of an investigation of ongoing mortalities in a tank system containing several species of freshwater tropical fish. All the fish had severe gill hyperplasia and inflammation. A common protozoan pathogen, *Ichthyopthirius multifilus*, was found in some specimens. The water quality was not good. Levels of nitrite, nitrate and phosphate were high. Non-haemolytic *Streptococcus agalactiae* was cultured from the kidneys of two fish. The ongoing mortality was likely to have been due to poor management of the aquarium system, and infection with both *Ichthyopthirius* and *Streptococcus*. *Streptococcus agalactiae* is a pathogen of an increasingly diverse range of fish species, as well as causing disease in several species of mammals. It is usually reported in marine fish species. The strains isolated from fish are typically non-haemolytic, unlike mammalian strains.

FLUKE IN GOLDFISH

Twelve goldfish in a group of 20 died over three weeks. During the past six months, the owner had introduced smaller fish to a tank in which there were four large goldfish. All the fish that died were the smaller, introduced, fish. The original four fish appeared to be unaffected. Examination of gill sections showed monogenean flukes on and around the gills, and inflammation and necrosis due to the fluke infestation. Goldfish are commonly infested with monogenean flukes and can become tolerant and shed the infestation. If, however, the flukes are re-introduced even after a short absence, heavy infestations can develop again. Burdens can become particularly high if the fish are stressed by poor water quality or movement of fish. The four larger fish may have been less stressed by the conditions in the tank because they had been in the tank for much longer than the smaller fish.

LABORATORY ACCESSIONS AND NOTIFIABLE DISEASES

During the quarter, there were 91 aquaculture accessions, 551 livestock accessions, 75 companion animal accessions, 78 wildlife accessions and 6 accessions from other sources.

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

Disease	Investigations	
	+ve	No.
American foul brood	0	1
Anthrax	0	8
Avian psittacosis	0	13
Bacterial kidney disease	0	33
Brucella ovis	0	21
Brucella suis (porcine brucellosis)	0	1
Clinical salmonellosis	37	99
Contagious agalactia	0	2
Enzootic bovine leucosis	0	40
Johne's disease	25	153
Leptospira hardjo	0	10
Leptospira pomona	0	11
Listeria	1	10
Macrocyclic lactone anthelmintic resistance	0	3
Marine aeromonad disease	9	39
Negative finfish bacteriology*	0	32
Negative finfish pathology†	0	1
Negative shellfish pathology‡	0	4
Piscirickettsiosis	0	2
Salmonella Abortusequi	0	1
Salmonella Abortusovis	0	4
Salmonella Enteritidis	0	1
Salmonella Pullorum	0	1
Verotoxic *Escherichia coli*	3	89

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

† Bonamiasis, iridovirosis of shellfish, nocardiosis of shellfish, perkinsosis of shellfish

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

Victoria

Contributed by:
Tristan Jubb
DPI, Victoria

BONE FRAGILITY IN YOUNG CATTLE

A syndrome of ataxia, flexural contracture and bone fragility that had occurred over several years was investigated in a beef herd near Leongatha in Gippsland. Two 9-month-old calves were autopsied. One had a spiral fracture of the femur, brittle ribs and torn ligaments in the scapulo-humeral joint and the other had a fracture of the right humerus and brittle ribs. On longitudinal sections, the articular cartilage of

the long bones was thin and wavy and the cortical bone was thinner than expected. Histopathology on the long bones revealed that the cartilage at the growth plate was thin and wavy and the normal trabecular pattern of the primary spongiosis area was abnormal and characterised by disorganised columns of chondrocytes and truncated remodelling into bony trabeculae. Liver copper levels were normal in these animals, and copper, selenium and B12 assays were normal in other cattle on the farm. Iatrogenic vitamin A toxicity is being investigated based on the repeated injections of vitamins A, D, and E received by these cattle.

PRIMARY COPPER DEFICIENCY IN WEANED LAMBS

In November, an outbreak of enzootic ataxia was diagnosed as the cause of neurological and skeletal disease in 30 of 150 four- to six-month-old weaned lambs in a prime lamb producing flock near Drysdale in south-west Victoria. Clinical signs included lameness, proprioceptive deficits of the hindlimbs and fractures of legs and ribs. Demeanour and appetite remained normal. Laboratory investigations confirmed low liver copper levels in lambs. Their mothers were anaemic and plasma copper levels were less than 0.5 µM/L (normal 8 to 30 µM/L). The pasture was predominantly lush rye grass and clover. Soil tests found low levels of all trace elements including molybdenum. Ewes and lambs have been dosed with copper pellets.

VIBRIO SPLENDIDUS IN ABALONE

Between late November and early December above-normal mortalities were experienced by two Victorian abalone farms and a couple of abalone farms near Adelaide. Mortalities occurred in the older age groups but not in the young abalone. One thing in common among these farms and a Tasmanian abalone farm, which did not have mortalities, was the importation of abalone feed from Taiwan. Farmers were concerned that increased mortalities across many farms, importing the same feed at about the same time, was more than a coincidence. Figures from one Victorian farm indicated a peak mortality of 1.3 per cent per day and an average of 0.83 per cent for ten days in one of their breeding sections. Sick abalone were seen huddling, were inappetent, and subsequently lost condition. Extensive bacteriology, histopathology and virology were undertaken. Samples were examined from healthy, moribund and freshly dead abalone as well as a feed sample. Vibrio spp. were isolated from all the abalone samples but not from the feed sample. Further typing of the vibrios revealed a pathogenic strain (Vibrio splendidus) from the freshly dead and moribund abalone, while the vibrio isolated from the healthy abalone was not a known pathogenic strain. Histopathological examination showed polygranulomas in different organs, with some necrosis in the gut and kidneys. No viral particles were detected by electron microscopy of multiple abalone sections. It was concluded that vibriosis was responsible for the mortalities, possibly secondary to some factor in the feed.

CONGENITAL EPIDERMOLYSIS IN ANGUS CATTLE

Bovine congenital epidermolysis was diagnosed as the cause of extensive skin lesions in four newborn calves born on a beef property near Benalla in north-east Victoria in October 2004. These calves had patches of hair loss and excoriated skin on different parts of the body but mainly on the legs and axillary area. They were weak, lame and had difficulty feeding. Two calves died within three days of birth. A third calf, being near death, was euthanised and submitted to Attwood Veterinary Laboratory for post mortem examination. Extensive erosions were found in the skin over the entire body as well as the mucous membranes of the mouth and oesophagus. Ruptured bullae between the claws were infected and flyblown, causing lameness. The moribund state of the calf was attributed to an acute terminal septicaemia. Clinical and histological findings of bovine congenital epidermolysis are similar to those of familial acantholysis, an autosomal recessive disorder of Angus calves in New Zealand. This purebred Angus herd had been sourcing bulls from the same stud for at least 10 years, and no replacement cows had been purchased for at least 20 years. The farmer also noted that a similar case on his property had been treated by a private veterinary practitioner without success two years ago. The farmer was advised of the possibility that this problem may reflect inbreeding.

SUSPECTED OLEANDER POISONING OF CATTLE

Fatal poisoning by ingestion of dried leaves and branches of Nerium oleander was suspected as the cause of death in four Angus yearling cattle in a herd near Drysdale in south-west Victoria. The cattle were among a group of 12 grazing in two paddocks in the corners of which were a number of oleander shrubs. Over a period of four days, the four yearling cattle became ill and died, despite treatment with antibiotics and anti-inflammatory drugs. Clinical signs included bloody diarrhoea and nervous distress (mania). Differential diagnoses included plant and heavy metal poisonings, and acute infectious enteritis (e.g. salmonellosis). Post mortem examinations were carried out on two affected yearlings. Gross and histological findings included an acute haemorrhagic enteritis (bloody diarrhoea) and extensive myocardial haemorrhage that were consistent with poisoning due to oleander.

POLIOENCEPHALOMALACIA IN WEANED DAIRY CALVES

Over a seven-day period in early December, seven of 89 weaned, four- to five-month-old calves on an irrigated dairy farm near Maffra in Gippsland were found with neurological signs including blindness and depression. Two calves died. A post mortem examination was performed on one calf, and histological lesions in the brain were typical of polioencephalomalacia. Five calves responded to intensive treatment with thiamine hydrochloride. Lead poisoning, viral and bacterial brain infections were excluded by laboratory examination. Predisposing causes for the outbreak have not yet been identified. The calves had been weaned onto good-quality irrigated clover and ryegrass pastures two to three months earlier, and had not been fed concentrates since weaning. Pasture was free of weeds including bracken fern. Measurement of sulphate levels in stock water and pasture are in progress. Management options for the unaffected calves including supplementation with thiamine were considered, but found to be difficult to implement. Calves were inspected daily and advice was given to treat any affected calves early and intensively with thiamine hydrochloride. The outbreak was estimated to cost $1400 including loss of stock, veterinary costs and labour.

SEVERE RESPIRATORY DISEASE IN PIGS

An isolated piggery near Bendigo in north-west Victoria, which had been operating for several years, was afflicted with an acute-onset respiratory condition, with coughing and deaths occurring in all ages of pigs. Autopsy of affected pigs found acute bronchopneumonia. Histology and polymerase chain reaction testing revealed the causative agent as *Mycoplasma hyopneumoniae*. This farm had been free of this organism. Investigation revealed that the source of infection was most likely two replacement breeder boars. The breeding company supplying the boars did not realise that this herd was free of *Mycoplasma hyopneumoniae* and sent the boars from an infected herd. This outlines the need for good biosecurity, highlights the need for investigating veterinarians to examine all aspect of a farm's production system, in particular the adequacy of the biosecurity system. This farmer now faces the prospect of a reduction in his carcase weight profit from 40 to 5 cents/kg, representing an annual reduction in income of $250 000. Restoring the original health status of the farm will require repopulation of the herd, costing between $280 000 and $400 000, depending upon whether a total or partial depopulation is chosen. All of this could have been avoided if a good biosecurity system had been in place.

ATAXIA IN RABBITS

A syndrome of progressive ataxia leading to complete loss of coordination and requirement for euthanasia was investigated in a colony of laboratory rabbits. Ten of a group of 160 were affected. Two rabbits were autopsied and no gross lesions were seen. On histopathology there was necrosis and loss of Purkinje cells, and swelling of the proximal axons in the cerebellum. Marked Wallerian degeneration of white matter tracts was a feature in the spinal cord. Based on the histopathology and history, a diagnosis of cerebellar cortical abiotrophy was made. This is thought to have a genetic basis in other species and is probably the case here, as this rabbit colony had been closed for more than 80 years.

MYOPATHY IN LABORATORY MICE

A large research institution submitted a number of litters of inbred mice including immunodeficient strains for histopathological examination for the cause of an abnormal gait. The ages of the mice varied from young adults to families of juveniles. The mice were fixed in formalin and sections of organs were cut, including muscles from the stifle. Skeletal muscle fibres were observed to have extensive degeneration. The lesions appeared cellular due to attempts at regeneration and fibrosis. Some mice had calcified degenerate fibres as well, indicating a more chronic phase of the disease. No evidence of significant changes was observed in the other organs. It is thought that these changes were due to a nutritional deficiency such as occurs when old feed in which the vitamin E supplement has oxidised, is fed. A nutritional disease in a research institute is a serious situation where expensive research efforts would be compromised by sick animals. The food is being analysed for deficiencies.

Western Australia

Contributed by:
Richard Norris
Department of Agriculture – WA

BOVINE MALIGNANT CATARRHAL FEVER

Seven of 320 Aberdeen Angus cattle of mixed age and sex died at Esperance in early November. Clinical signs included blindness, ataxia, pyrexia, purulent nasal discharge, nasal and gingival erosions, and death within 48 hours. Histopathology revealed severe, multi-organ vasculopathy consistent with malignant catarrhal fever (MCF). By mid-December 17 cattle had died. This case was unusual because of the range of severe vascular lesions and the number of cattle involved. Usually MCF occurs as a sporadic disease that affects a single or small number of animals.

OVINE AXONAL MYELOPATHY

An ongoing neurological problem involving hind limb weakness in lambs was investigated at Boyup Brook. The problem has occurred over several years in large healthy lambs up to eight months old, with total losses amounting to six from 2000 lambs. Affected sheep display weakness and paresis of the hind limbs leading to collapse and death usually occurs within two months if the animal is left in the mob. Biochemical tests revealed no evidence of muscle problems or trace element deficiencies. Histopathology revealed Wallarian degeneration predominantly involving the dorsolateral spinal cord tracts and extending from the cervical vertebrae to the sacral region. There was axonal degeneration. There are several conditions with similar pathological changes but different distribution of lesions. All of the previously described conditions appear to be familial and associated with particular lines of merino sheep.

OVINE PHOTOSENSITISATION

Photosensitisation occurred in 20 per cent of mixed sex, Poll Dorset X weaner sheep at Mingenew. The sheep grazed biserrula for one week, and gross lesions were noted soon after moving to a clover paddock. Microscopic changes suggested a mild toxic challenge to the liver. Photosensitisation associated with biserrula or clover is generally considered to be primary, and may not induce hepatic changes. Both plant types were considered to be possible causes of the syndrome in these sheep.

PURULENT OVINE MENINGITIS AND CHOROIDITIS

Fifteen of 2000 merino ewes and lambs at Yallingup were affected with neurological signs and increased mortality over the previous two to three weeks. Losses occurred mainly in the lambs, but some ewes were involved. Histopathology revealed severe, extensive purulent meningitis extending into the lateral ventricles and choroid plexus.

FACIAL ECZEMA SHEEP

Severe photosensitisation occurred in unweaned lambs and their mothers at Pingelly grazing a barley crop, badly affected by bunt fungus, that had been burnt in a fire in November 2003. Post mortem examination of one ewe revealed a hardened 'nutmeg' liver. Histopathology showed severe, subacute to chronic, cholangiohepatitis and small random areas of acute to subacute hepatocyte necrosis, highly suggestive of facial eczema. Pithomyces spore counts were 154 000/ gram pasture. Interesting aspects to this case were the unusual circumstances of sheep grazing a decomposing barley crop, the time of the year and the involvement of suckling lambs.

SALMONELLOSIS SHEEP

Salmonellosis occurred in mixed age hoggets at York that showed weight loss, weakness and death. The sheep were from Midland saleyards and were drenched with ivermectin and given a mineral supplement on arrival at York. *Salmonella* Typhimurium was isolated from intestinal content and lymph node. In another case, also at York, five hoggets died and another 20 of 350 had wasting and diarrhoea. The sheep were from saleyards and after arrival at York were drenched and fed hay for 24 hours before entering a feedlot. *S.* Typhimurium was isolated from intestinal content.

GLASSER'S DISEASE

Glasser's disease was the cause of long-standing high post-weaning mortalities (eight per cent) in a piggery at Cuballing. Histopathology showed pneumonia, pleuritis, cellulitis and hepatic peritonitis. *Haemophilus parasuis* was isolated from visceral swabs while culture of intestinal content yielded haemolytic *Escherichia coli* and *S.* Typhimurium. The case illustrates that while eco shelters (light weight, moveable shelters usually with straw bedding) provide effective housing units, sound management is also needed to prevent health problems.

ATROPHIC RHINITIS

Ongoing respiratory disease affected 10 to 15 piglets each week in a 1000 sow piggery at Pinjarra. The piglets developed a purulent nasal disease from about five days of age. Examination of three piglets showed various degrees of nasal turbinate destruction with large basophilic intranuclear inclusion bodies evident in sub-epithelial mucous glands, suggesting viral rhinitis as the primary disease. Severe fibrino-purulent bronchopneumonia with multifocal caseous, necrotising abscessation and intralesional bacteria was also seen. *Mycoplasma* sp. and *Bordetella bronchiseptica* were isolated from the nasal swabs of all three piglets.

CEREBELLAR DYSPLASIA GOATS

Twenty Boer kids at Lake Clifton developed weakness, lethargy and died about a week after birth. There were 30 Boer nannies and 10 feral nannies on the property, which had no history of problems in newborn kids. Only the Boer kids were affected. Histopathology revealed focal dystrophy of the cerebellar folia with a localised deficiency of Purkinje cells. Liver and plasma assays indicated a severe copper deficiency in affected kids (unmeasurable in the plasma, 3–4mg/kg in the liver, normal 30–700). Copper deficiency in goats has been linked to enzootic ataxia, hypomyelinogenesis, cerebellar abiotrophy and hypoplasia.

(Continued on page 22)

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 03	11778	749	15560	278	1901	300	9559	16	806	2	246	11
Jan–Mar 04	9689	542	7550	318	1746	289	4742	0	547	5	411	24
Apr–Jun 04	9803	827	11710	432	1865	456	8684	12	958	10	630	22
Jul–Sep 04	18309	109	26082	359	1282	252	10754	3	719	5	246	14
Oct–Dec 04	8337	540	11469	97	1872	362	6562	0	531	8	160	3
NSW	142	66	597	4	251	31	124	0	179	0	82	3
NT	1089	244	0	0	665	133	0	0	0	0	0	0
QLD	546	192	855	91	525	149	67	0	167	8	3	0
SA	734	3	764	0	89	31	824	0	4	0	3	0
TAS	1020	0	1865	0	0	0	1073	0	0	0	0	0
VIC	16	0	88	0	38	0	103	0	135	0	48	0
WA	4790	35	7300	2	304	18	4371	0	46	0	24	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. Infection with sheep strains occurs to varying extents across the sheep producing regions of southern Australia but has not been detected in Queensland. Cattle strains are endemic in south-eastern Australia but surveillance programs have not identified endemic infection in Queensland, Western Australia and Northern Territory, and active measures are taken to stamp-out any incursions. Table 2 shows the number of herds and flocks known to be infected. New approaches to controlling JD, based on risk assessment and management, have been developed. Market Assurance Programs (MAPs) are in operation for cattle, sheep, goats and alpaca, with the number of herds or flocks that have reached a status of Monitored Negative 1 (MN1) or higher shown in Table 3.

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 2004

	Cattle	Sheep	Goats	Deer	Alpaca	Total
NSW	743	416	51	100	1310	1398
NT	0	0	0	0	0	0
QLD	1	5			6	2
SA	289	242	17	39	587	123
TAS	110	31	1	1	143	60
VIC	330	89	0	29	448	1358
WA	0	0	0	0	0	18
AUS	1473	783	69	169	2494	2959

* 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 2004

	Cattle	Sheep	Goat	Alpaca	Total
NSW	743	416	51	100	1310
NT[#]	0	0	0	0	0
QLD[#]	1	5	0	0	6
SA	289	242	17	39	587
TAS	110	31	1	1	143
VIC	330	89	0	29	448
WA[#]	0	0	0	0	0
AUS	1473	783	69	169	2494

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

ENZOOTIC BOVINE LEUCOSIS

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

Table 4: Dairy herds tested free of enzootic bovine leucosis at 31 December 2004

	NSW	NT	QLD	SA	TAS	VIC	WA	AUS
Free	1085	0	932	453	525	6168	360	9 523
Herds	1101	0	938	453	525	6215	360	9 592

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

Table 5: Ovine brucellosis accredited-free flocks at 31 December 2004

NSW	NT	QLD	SA	TAS	VIC	WA	AUS
700	0	0	490	86	617	147	2040

Quarterly disease statistics — surveillance activities

TUBERCULOSIS

Australia was declared free from bovine tuberculosis (TB) on 31 December 1997, exceeding the OIE requirements for declaration of country freedom. The last cases of TB were detected in buffalo in January 2002 and in cattle in August 2000 and trace-forward and trace-back slaughter carried out according to the Tuberculosis Freedom Assurance Program (TFAP2). The National Granuloma Submission Program (NGSP) has been the major surveillance tool for TB since 1992. All Australian laboratories supporting TFAP2 are accredited for veterinary testing by the National Association of Testing Authorities (NATA) under ISO/IEC 17025. Laboratories approved for culture of *Mycobacterium bovis* must pass an external quality assurance program run by the Australian Reference Laboratory for Bovine Tuberculosis on an annual basis. Tables 6 and 7 summarise the program's results.

Table 6: National case register for bovine tuberculosis

	BTEC - impending free				TFAP - free					TFAP2	
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
NSW	0	1	0	0	0	0	0	4[1]	0	0	0
NT	5	5	3[2]	4	2	1	0	0	2[2]	0	0
QLD	2	1	1	2	2[3]	0	2	3[1]	1[1]	0	0
SA	0	0	1	0	0	0	0	0	0	0	0
TAS	0	0	0	0	0	0	0	0	0	0	0
VIC	0	0	1[3]	0	0	0	0	0	0	0	0
WA	0	1	1	1	1	0	0	0	0	0	0
AUS	7	8	7	7	5	1	2	7	3	0	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.*

Table 7: Results of the National Granuloma Submission Program

	Granulomas submitted	TB +ve
Oct–Dec 03	1676	0
Jan–Mar 04	1188	0
Apr–Jun 04	1189	0
Jul–Sep 04	1071	0
Oct–Dec 04	1175	0
NSW	38	0
NT	0	0
QLD	747	0
SA	252	0
TAS	8	0
VIC	34	0
WA	96	0

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 247 abortion investigations were performed during the reporting period—all with negative results for bovine brucellosis, as shown in Table 8.

Table 8: Surveillance for bovine brucellosis

	Abortion investigations		Test for other reasons	
	Tests	+ve	Tests	+ve
Oct–Dec 03	181	0	4161	0
Jan–Mar 04	294	0	714	0
Apr–Jun 04	231	0	3025	0
Jul–Sep 04	187	0	795	0
Oct–Dec 04	247	0	3502	0
NSW	2	0	313	0
NT	0	0	0	0
QLD	131	0	204	0
SA	0	0	4	0
TAS	0	0	0	0
VIC	3	0	12	0
WA	111	0	2969	0

NORTHERN AUSTRALIA QUARANTINE STRATEGY

In recognition of the special quarantine risks associated with Australia's sparsely populated northern coastline, AQIS conducts an animal disease surveillance program as an integral component of the Northern Australia Quarantine Strategy (NAQS). The NAQS surveillance program provides early warning of disease threats to livestock industries, and in some cases human health. NAQS surveillance activities include both offshore and onshore components. Tables 8 and 9 summarise NAQS activity in Australia over the past five quarters.

Contact: David Banks, Biosecurity Australia, DAFF

Table 8: Summary of recent NAQS activity in Australia

	Oct–Dec 03		Jan–Mar 04		Apr–Jun 04		Jul–Sep 04		Oct–Dec 04	
	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve
Aujeszky's disease	117	0	71	0	74	0	90	0	157	0
Classical swine fever	117	0	71	0	74	0	90	0	157	0
Japanese encephalitis	48	9	394	16	173	0	97	0	201	0
Nipah virus	138	0	53	0	76	0	90	0	158	0
Porcine reproductive and respiratory syndrome	117	0	71	0	74	0	90	0	158	0
Surra	88	0	127	0	112	0	49	0	69	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. Since 1999, sentinel pigs at Badu Island have seroconverted each wet season and seroconversions have been detected on other central Torres Strait islands in surveys. In early 2004 the sentinel pigs located on Badu Island and at Bamaga on the mainland seroconverted, and JE virus was isolated at each location. This was the first detection of JE on the mainland since 1998. Subsequently, feral pigs from south of Mapoon showed a pattern of serology consistent with exposure to JE virus, although the time of exposure is undetermined.

PORTS SURVEILLANCE PROGRAM

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

Contact: David Banks, Biosecurity Australia, DAFF

Table 9: Number of inspections of insect trap sites

	Oct–Dec 03	Jan–Mar 04	Apr–Jun 04	Jul–Sep 04	Oct–Dec 04
Port surveillance					
Asian bees	10	12	15	18	18
Bee mites	14	20	28	21	21
Culicoides	32	29	32	30	29
Screw-worm fly	31	30	28	21	23
NAQS					
Screw-worm fly	108	108	36	24	45

SALMONELLA SURVEILLANCE

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

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

Table 10: Salmonella notifications, 1 October to 31 December 2004

Serovars	avian	bovine	canine	equine	feline	ovine	porcine	other	Total
S. Bovismorbificans	0	19	1	0	0	1	2	1	24
S. Dublin	0	36	0	0	0	0	0	0	36
S. Infantis	1	0	4	0	1	0	2	0	8
S. Typhimurium	9	38	6	8	1	0	8	3	73
Other	3	14	15	8	2	2	2	14	60
Total	13	107	26	16	4	3	14	18	201

ZOONOSES

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

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

Table 11: Notifications of zoonotic diseases in humans

Disease	Q4-03	Q1-04	Q2-04	Q3-04	Q4-04	Current quarter						
					AUST	NSW[#]	NT	QLD	SA	TAS	VIC	WA
Brucellosis	4	5	8	12	18	3	0	14	0	0	1	0
Leptospirosis	28	49	67	35	26	8	0	8	2	0	5	3
Listeriosis	17	17	20	15	14	8	0	1	0	0	3	2
Ornithosis	60	67	65	51	55	19	0	1	1	0	33	1
Q fever	132	107	132	109	115	54	0	24	26	0	7	4

[#] NSW and ACT data are combined

NATIONAL TSE SURVEILLANCE PROGRAM

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

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

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

	Oct–Dec 03		Jan–Mar 04		Apr–Jun 04		Jul–Sep 04		Oct–Dec 04	
	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep
NSW	20	49	25	38	38	40	48	49	7	15
NT	8	0	3	0	1	0	11	0	4	0
QLD	40	2	20	9	58	2	30	9	23	5
SA	8	33	3	18	10	19	6	11	3	6
TAS	0	4	1	1	4	1	5	1	2	10
VIC	18	26	19	11	12	32	26	37	23	24
WA	8	28	10	14	11	11	10	21	5	56
AUS	102	142	81	91	134	105	136	128	67	116

NATIONAL RESIDUE SURVEY

Of 4158 samples tested during the quarter for residues of agricultural and veterinary chemicals and environmental contaminants, a residue of 17-alpha 19 nortestosterone was detected in urine sampled from a cow, consistent with endogenous production, and there were two metal detections above the relevant Australian standard in samples from sheep. A further thirty-four detections of metals were made in other species where standards have not been established, and so are not considered violative. The results are summarised in Table 13.

The metal detections in sheep were both of cadmium. The cadmium detections (1.5 and 1.7 mg/kg) exceeded the maximum level (ML) of 1.25 mg/kg, but were below the residue action level (RAL) of 2.5 mg/kg, so a traceback investigation was not initiated.

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

Contributed by: Jason Lutze, National Residue Survey, DAFF

Table 13: National Residue Survey, 1 October to 31 December 2004

Each pair of figures gives the number of residues above the maximum residue limit (or the maximum level), and the number of samples tested.

	NSW		NT		QLD		SA		TAS		VIC		WA		AUS	
Anthelmintics																
cattle	0	57	0	3	0	89	0	23	0	8	0	37	0	11	0	228
pigs	0	23	0	0	0	22	0	10	0	0	0	19	0	5	0	79
sheep	0	95	0	0	0	9	0	47	0	4	0	83	0	69	0	307
other	0	6	0	0	0	12	0	1	0	0	0	10	0	11	0	40
Total	0	181	0	3	0	132	0	81	0	12	0	149	0	96	0	654
Antimicrobials																
cattle	0	104	0	3	0	120	0	18	0	8	0	56	0	19	0	328
pigs	0	61	0	0	0	41	0	35	0	1	0	72	0	17	0	227
poultry	0	50	0	0	0	29	0	20	0	10	0	20	0	19	0	148
sheep	0	104	0	0	0	8	0	75	0	7	0	88	0	68	0	350
other	0	11	0	0	0	4	0	5	0	0	0	5	0	0	0	25
Total	0	330	0	3	0	202	0	153	0	26	0	241	0	123	0	1078
Growth promotants																
cattle	0	74	0	2	1	141	0	14	0	2	0	47	0	8	1	288
pigs	5	55	0	2	6	31	0	18	0	2	3	44	3	9	17	161
poultry	0	5	0	0	0	3	0	2	0	1	0	2	0	2	0	15
sheep	0	68	0	0	0	4	0	53	0	0	0	51	0	63	0	239
other	0	3	0	0	0	3	0	1	0	0	0	7	0	0	0	14
Total	5	205	0	4	7	182	0	88	0	5	3	151	3	82	18	717
Insecticides																
cattle	0	114	0	5	0	141	0	26	0	11	0	72	0	13	0	382
pigs	0	11	0	1	0	22	0	13	0	0	0	23	0	4	0	74
sheep	0	134	0	0	0	12	0	109	0	10	0	111	0	89	0	465
other	0	2	0	2	0	21	0	8	0	1	0	2	0	9	0	45
Total	0	261	0	8	0	196	0	156	0	22	0	208	0	115	0	966
Metals																
cattle	0	25	0	0	0	32	0	3	0	3	0	18	0	4	0	85
pigs	0	10	0	0	0	14	0	24	0	1	0	28	0	6	0	83
sheep	0	20	0	0	0	7	0	18	0	0	0	25	2	21	2	91
other	8	9	1	1	8	10	11	8	0	0	5	6	1	5	34	39
Total	8	64	1	1	8	63	11	53	0	4	5	77	3	36	36	298
Miscellaneous																
cattle	0	50	0	0	0	66	0	18	0	2	0	34	0	9	0	179
pigs	0	52	0	0	0	28	0	20	0	6	0	42	0	13	0	161
sheep	0	18	0	0	0	5	0	28	0	3	0	14	0	23	0	91
other	0	5	0	0	0	5	0	0	0	1	0	3	0	0	0	14
Total	0	125	0	0	0	104	0	66	0	12	0	93	0	45	0	445

(Continued from page 17, Western Australia report)

PSITTACOSIS IN CARNABY'S COCKATOOS

Respiratory disease, diarrhoea and death were seen in caged birds at Moora and in a local colony of about 100 wild birds including Carnaby's cockatoos. The owner feeds the wild colony daily and there is mixing with caged and rehabilitated birds present (mixed species including parrots). Clinically affected birds became lethargic, developed crusty eyes, green diarrhoea and lost weight. Three black cockatoos died. Of the 100 birds that regularly attend feeding, only 40 or so now do so. Lesions in a Carnaby's cockatoo included single to focal areas of hepatocyte necrosis associated with aggregates of histiocytes and heterophils. Histocytic aggregates were also present within sinusoids and in periportal areas. The bird was diagnosed as having moderate subacute necrotising histiocytic hepatitis, consistent with chlamydiosis. Avian influenza was initially considered as a possible diagnosis because a faecal sample from a sick bird tested positive for influenza A group antigen by Directagen testing. However, additional PCR and haemagglutination inhibition tests on allantoic fluid harvested from inoculated eggs were negative (tested at the Australian Animal Health Laboratory, Geelong). Anecdotal reports have suggested that faeces can contain endogenous peroxidases that cause false positive reactions.

SUSPECT EXOTIC OR EMERGENCY DISEASE INVESTIGATIONS

There were 30 investigations of diseases suspected to be either exotic or a possible emergency reported during the quarter, as shown in Table 14. More details about some of these investigations can be found in State reports.

Table 14: Exotic or emergency disease investigations reported from 1 October to 31 December 2004

DISEASE	SPECIES	STATE	MONTH	RESPONSE	FINDING
Anthrax	ovine	VIC	Sep	2	enterotoxaemia
Anthrax	bovine	VIC	Oct	1	negative
Anthrax	bovine	VIC	Oct	1	negative
Anthrax	bovine	VIC	Nov	1	negative
Anthrax	bovine	VIC	Nov	2	negative
Anthrax	bovine	VIC	Dec	1	negative
Avian influenza	avian	NSW	Oct	3	peritonitis; negative for avian influenza (AI) and Newcastle disease (ND)
Avian influenza	avian	NSW	Nov	2	chlamydiosis; negative for AI and ND
Avian influenza	avian	NSW	Dec	3	negative
Avian influenza	avian	NT	Oct	3	negative for AI and ND; 2 investigations
Avian influenza	avian	VIC	Nov	2	parasitism
Avian influenza	avian	WA	Nov	3	negative for AI and ND
Caprine and ovine brucellosis	ovine	VIC	Nov	1	*Brucella ovis*
Contagious bovine pleuropneumonia	bovine	NSW	Sep	2	acute fibrinous pneumonia
Contagious bovine pleuropneumonia	bovine	NSW	Oct	2	pulmonary pasteurellosis
Equine herpes virus	equine	VIC	Dec	2	lightning strike
Foot-and-mouth disease	bovine	VIC	Nov	2	salmonellosis
Hendra virus	equine	QLD	Dec	3	Hendra virus
Hendra virus	equine	QLD	Feb	3	negative
Lumpy skin disease	bovine	QLD	Jan	2	cutaneous lymphoma
Maedi-visna	caprine	NSW	Nov	2	pulmonary abscessation
Newcastle disease	avian	NSW	Nov	2	negative
Newcastle disease	avian	NSW	Nov	3	Marek's disease
Newcastle disease	avian	VIC	Oct	2	infectious laryngotracheitis
Newcastle disease	avian	WA	Dec	2	negative
Rabies	fauna	VIC	Dec	3	negative
Scrapie	caprine	NSW	Sep	2	listeriosis
Screw-worm fly	other	NT	Dec	2	trauma
Varroa mite (*V. destructor)*	apian	QLD	Nov	3	*Varroa jacobsonii*

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 5584	02 6272 3307	david.banks@daff.gov.au
Chris **Bunn**	Emergency Disease Preparedness, AFFA	02 6272 5540	02 6272 3372	chris.bunn@daff.gov.au
Celia **Dickason**	SA State Coordinator	08 8207 7803	08 8207 7852	dickason.celia@saugov.sa.gov.au
John **Elliott**	Tas. State Coordinator	03 6336 5334	03 6336 5374	john.elliott@dpiwe.tas.gov.au
Jenny **Hutchison**	Australian Government NAHIS Coordinator	02 6272 4719	02 6272 3150	jenny.hutchison@daff.gov.au
Tristan **Jubb**	Vic. State Coordinator	03 5430 4545	03 5430 4520	tristan.jubb@dpi.vic.gov.au
David **Kennedy**	Johne's Disease Coordinator	02 6365 6016	02 6365 6088	david@ausvet.com.au
Diane **Lightfoot**	National Enteric Pathogen Surveillance Scheme	03 9344 5701	03 9344 7833	d.lightfoot@microbiology.unimelb.edu.au
Kelly **Long**	Australian Milk Residue Analysis Survey	03 9810 5900	03 9819 4299	klong@dairysafe.vic.gov.au
Peter **Miller**	National Residue Survey	02 6272 3762	02 6272 4023	peter.miller@daff.gov.au
Barbara **Moloney**	NSW State Coordinator	02 6391 3687	02 6361 9976	barbara.moloney@agric.nsw.gov.au
Richard **Norris**	WA State Coordinator	08 9368 3637	08 9367 6248	rnorris@agric.wa.gov.au
David **Pitt**	Qld State Coordinator	07 4722 2694	074778 4307	david.pitt@dpi.qld.gov.au
Brian **Radunz**	NT State Coordinator	08 8999 2130	08 8999 2089	brian.radunz@nt.gov.au
Jenean **Spencer**	Communicable Diseases Intelligence	02 6289 1555	02 6289 7791	www.health.gov.au
Neville **Spencer**	National Granuloma Submission Program	02 6271 6650	02 6272 5442	neville.spencer@aqis.gov.au
Simon **Winter**	Animal Health Australia Program Manager	02 6203 3988	02 6232 5511	simon.winter@aahc.com.au
Rupert **Woods**	Australian Wildlife Health Network	02 9978 4749	02 9978 4516	rwoods@zoo.nsw.gov.au

Disease Watch Hotline — 1800 675 888

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

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