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CONTENTS

Preface

This issue includes reports on the Rapid Response Team exercise in Adelaide, Exercise 'Adventurous Goose' and on Australia's project to enhance surveillance capabilities in Myanmar. Additional articles include reports from the 73rd General Session of the World Organisation for Animal Health (OIE) and from Animal Health Committee. 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).

I was deeply saddened by the sudden passing of the National NAHIS Coordinator, Chris Baldock, one of the driving forces behind the National Animal Health Information System in Australia. Chris was also involved in the National Arbovirus Monitoring Program and the Transmissible Spongiform Encephalopathy (TSE) Freedom Assurance Program. His contribution to animal health in Australia will be greatly missed.

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

Vale Chris Baldock

Animal Health Australia was saddened and shocked by the death of Chris Baldock on 6 July.

Chris was a Director of Ausvet Animal Health Services and had a close collaboration with Animal Health Australia. From early in the Company's history, Chris coordinated a number of key national programs, including the National Animal Health Information System, the National Arbovirus Monitoring Program, the TSE Freedom Assurance Program and numerous other animal health projects.

Chris was one of Australia's leading veterinary epidemiologists. He was a very open and generous man giving a lot of his time in training and mentoring veterinary epidemiologists in Australia and overseas. Having worked in many countries during his career, Chris' warm and captivating personality is reflected by the many deep and professional friendships he made throughout the world.

He was a visionary thinker regarding Australia's animal health services, including major contributions to the development of a national surveillance strategy for animal health in Australia.

We offer our sincere condolences to his wife Trish, daughter Sarah and sons Christian and Pat.

Contributed by: Simon Winter, Animal Health Australia

Animal Health Australia
Australian Animal Health Council Ltd ACN 071 890 956

National Arbovirus Monitoring Program

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

This report covers the first half of 2005, when arboviral activity in northern Australia is expected. During this period, large areas of Australia were either drought-affected or had reduced rainfall and a late start to the wet season. Neither vector activity nor seroconversions to bluetongue or Akabane viruses were detected in Victoria (Vic), Tasmania (Tas) or South Australia (SA) in the first half of 2005.

AKABANE VIRUS

Akabane viral activity was more restricted than in 2004, and considerably less than the widespread activity recorded in 2003. The effects of the drought, coupled with herd immunity persisting from 2003 are likely responsible for this reduced activity. No activity was detected in Western Australia (WA), and there was restricted activity in the Northern Territory (NT). In Queensland (Qld), viral activity was detected in mid-central and southern areas. In New South Wales (NSW), viral transmission commenced before January in the north-east, and extended southwards along the coast to the Hunter Valley during the autumn, generally reaching the limits of the endemic area.

BLUETONGUE VIRUS

Bluetongue viral activity did not extend beyond the current boundary of the zone of possible activity during this six-month period, except for the Hunter Valley region in NSW, where seroconversions were noted in February and March in the surveillance zone. The Australian bluetongue map, available on the internet at www.namp.com.au/mapdownload.php, shows the current zone boundaries, and indicates a small retraction of the area of possible activity in south-eastern Qld, western Qld and the eastern side of the NT. No evidence of seroconversions was detected in WA. In the NT, bluetongue viral activity occurred in all the northern herds. However, activity was restricted and began later than usual, with most seroconversions occurring from April to June. In Qld, bluetongue viral activity was restricted and was mostly confined to the northern and coastal areas, whilst in April and May seroconversions were recorded in single animals from two sentinel herds in the south-east corner of Qld. Serosurveillance at a NAQS sentinel monitoring site in Bamaga has detected seroconversions to serotype 16 and perhaps type 6, and could indicate a new incursion to Qld from Papua New Guinea. Serotype 16 has only previously been recorded in the north of the Northern Territory and Western Australia, and serotype 6 has not previously been recorded in Australia. Further investigations are being undertaken to confirm the nature and source of the virus. In NSW, there were two separate foci of transmission – one on the far north coast and the other in the Manning region, with very limited spread in the Hunter Valley. The viral activity in the Hunter is the first in this region for four years and coincided with very good rainfall in autumn following a period of below-average rainfall.

BOVINE EPHEMERAL FEVER VIRUS

BEF virus was more widespread than both Akabane and bluetongue viruses and this may reflect more favourable environmental conditions for the BEF vectors. Neither seroconversions nor confirmed clinical cases were observed in Tas, Vic or WA. However, BEF viral activity was widespread in both Qld and NT at the beginning of the year, and there were numerous clinical cases. In NSW, flooding in the north-west slopes in December was followed by suspected cases in January and February. From March to May, cases were reported along the coast and Hunter region, extending south as far as Camden.

INSECT TRAPPING

In WA, 11 species of *Culicoides* were collected. Numbers were low and no exotic species were detected. Of the *Culicoides species* regarded as bluetongue vectors in Australia (*C. brevitarsis, C. fulvus, C. actoni, C. wadai*), only *C. brevitarsis* was trapped in WA this period. In the NT, all four bluetongue vector species were caught with *C. brevitarsis* being the most common and widespread species. *C. brevitarsis* was found at the Darwin port monitoring site in January and February. In Qld, *C. brevitarsis* was collected at the usual coastal and near-coastal sites. At inland sites, it remained present at Dalby, but disappeared from Roma after being collected there the previous quarter. It was collected at Goondiwindi for the first time this year. This is consistent with westward spread of *C. brevitarsis* in south Qld in spring-autumn. It was not collected at Normanton despite being collected the previous quarter, which may indicate that *C. brevitarsis* populations are reduced by the hot summers in this area. In NSW, *C. brevitarsis* was only detected in its usual range with average abundance. For the first time for many years, *C. wadai* was not detected in NSW.

Contributed by: Jenny Hutchison, AusVet Animal Health Services.

Exercise Adventurous Goose

A national Emergency Animal Disease Rapid Response Team (RRT) was established during the 2003–2004 financial year. The purpose of the RRT is to assist states and territories in the establishment of a Local Disease Control Centre (LDCC) and State Disease Control Headquarters (SDCHQ) during the response to an Emergency Animal Disease (EAD). The RRT comprises personnel from across Australia who have experience and training in a range of control centre management roles (as per the AUSVETPLAN Control Centre Management Manuals).

As part of the ongoing development of the RRT, it has been agreed nationally that an annual exercise be conducted. This year's exercise was conducted during the week commencing 30 May 2005, in Adelaide, South Australia. The exercise was known as Exercise Adventurous Goose (the word 'goose' in the title is consistent with local protocol and indicates to South Australian agencies that this activity is an exercise).

Exercise Adventurous Goose was developed jointly by Primary Industries and Research South Australia (PIRSA), Animal Health Australia and the Australian Government Department of Agriculture, Fisheries and Forestry.

The exercise development team identified that the outcomes for Exercise Adventurous Goose should include:

- a greater understanding by RRT and PIRSA personnel of their AUSVETPLAN role during the response to an EAD,
- an evaluation of PIRSA's control centre procedures for responding to an EAD,
- arrangements developed, practised and documented for the reception and departure of RRT members in a jurisdiction,
- provide mentoring for new RRT members and PIRSA personnel, and
- provide an opportunity for assessment against specified AUSVETPLAN roles.

Exercise Adventurous Goose was identified as one of the many precursor activities required to prepare for a national exercise in November 2005 (Exercise Eleusis '05).

In view of this, many of the exercise outputs (including the scenario) were consistent with the national exercise, allowing some of the outputs of exercise Adventurous Goose to be used as inputs to the national exercise and other pre-cursor activities.

The exercise scenario simulated an outbreak of avian influenza in South Australia, with the response during the exercise representing days six, seven, eight and part of day nine of the outbreak. Participants were assigned specific roles within the simulated LDCC or SDCHQ and were required to respond to the developing scenario, producing or contributing towards the production of a range of specific outputs, such as Incident Action Plans, EAD Response Plans, talking points, briefings and Situation Reports.

The exercise was conducted in a number of locations across the Waite Campus of the University of Adelaide and included approximately 90 participants representing industry and government agencies from within South Australia and other jurisdictions. The exercise was controlled by an exercise management team of 16 staff, with two observers (from the Exercise Eleusis '05 development team) and four assessors.

The exercise provided a valuable learning opportunity for those involved and identified a range of areas that need to be addressed by the RRT managers and recipient jurisdictions as well as recommending activities for future exercises.

Article Contributed by Tony Callan, Emergency Risk

73rd OIE General Session

The 73rd General Session of the World Organisation for Animal Health (OIE) was held in Paris from 22 – 27 May 2005. Approximately 700 participants attended the meeting from the 167 Member Countries of OIE, intergovernmental organisations such as FAO and WHO, and many non-governmental organisations.

Several revised chapters of the Terrestrial Animal Health Code were debated and adopted including new chapters on bovine spongiform encephalopathy (BSE), avian influenza (AI), bluetongue and bovine tuberculosis. Revised guidelines on the prudent use of antimicrobials and on risk assessment for antimicrobial resistance were adopted.

- The BSE chapter now provides for three categories of BSE risk status–negligible, controlled and undetermined risk. Subject to risk mitigation measures, boneless beef can be traded from animals below 30 months of age, irrespective of the risk category of the exporting country. New surveillance arrangements were approved, but may be amended

again next year.
- In the new AI chapter, poultry is defined to exclude wild birds. The chapter deals not only with the occurrence of clinical signs, but also with the presence of infection with AI virus in the absence of clinical signs. The concept of compartments (systems where disease is prevented through the implementation of strong biosecurity measures) is applied in the chapter.

The proposed single list of diseases notifiable to OIE was adopted; Member Countries did request that, in future, OIE provide the scientific rationale for including a disease in the list.

Animal welfare guidelines were adopted on slaughter for human consumption, slaughter for disease control purposes, transport of animals by land and transport of animals by sea. These guidelines will be further refined by specialist working groups that will consider the comments made by Member Countries and submit new drafts for adoption in 2006.

Compartmentalisation was the subject of much discussion. Key points that arose from the discussions were:

- compartmentalisation is a tool to facilitate trade
- compartments are a partnership arrangement between industry and government
- agreement on compartments must be reached between the importing and exporting countries (i.e. compartments are not assessed by OIE).

Technical Items were presented on the Implementation of OIE Standards in the Framework of the SPS Agreement and on Applications of Genetic Engineering for Livestock and Biotechnology Products.

- As a result of the first of these, OIE has agreed to consider support methods for the evaluation of Veterinary Services in Member Countries, particularly developing countries. A tool designed to assist in the evaluation of Veterinary Services is available on the internet (at http://www.oie.int/eng/OIE/organisation/en_vet_eval_tool.htm).
- As a result of the second Technical Item, an OIE Ad hoc Group on Biotechnology is to be formed to support the work of OIE Specialist Commissions and related Working Groups.

Dr Bernard Vallat was re-elected as Director General of the OIE for a further five year term. During this period, he will oversee the implementation of the 4th OIE Strategic Plan (2005 – 2010) that was adopted during the General Session. It focuses on five areas:

- animal disease reporting
- development of animal health standards
- prevention, control and eradication of animal diseases and zoonoses
- development and influence of the OIE in the design and implementation of animal health related policies, as well as of veterinary research
- reinforcement of capacity building particularly of the veterinary services in developing countries.

Contributed by: Jill Mortier, International Co-ordinator, OCVO, DAFF

FMD surveillance in remote Myanmar

Recent outbreaks of emerging animal diseases have turned a spotlight onto the capacity of south-east Asian countries to perform animal disease surveillance. These outbreaks have resulted in livestock mortality, economic loss and loss of human life. Political, financial and industry leaders have been made painfully aware of the crippling impact of animal diseases on domestic and transborder trade, irrespective of whether the diseases are novel or long established.

Since late 2004, DAFF has been managing a program to assist South-east Asian countries improve their disease surveillance capabilities. The program, known as the Sanitary and Phytosanitary Capacity Building Program (SPS CBP), has three-year funding from AusAID to enhance the capacity of ASEAN countries to meet international standards consistent with the WTO and SPS Agreements. The program provides support to expand the capacity of ASEAN countries to describe and manage animal and plant health. The animal health component of the SPS CBP will include an ASEAN-wide study to identify livestock trade opportunities and animal health impediments to taking advantage of these opportunities. The program will also provide three-year training in integrated disease management.

The program will help animal health authorities implement regional FMD strategies in the MTM region, the narrow isthmus comprising the southern extremities of Myanmar and Thailand and the northern part of Peninsular Malaysia. The program is assisting Myanmar to meet MTM surveillance standards within its part of the MTM region, with the goal of accelerating the definition of FMD buffer and control zones. Demonstration of FMD freedom would open the possibility of livestock owners in southern Myanmar gaining access to lucrative Malaysian markets. The surveillance project is being carried out

by the Myanmar Livestock Breeding and Veterinary Department in collaboration with the south-east Asia FMD Regional Coordination Unit in Bangkok. SPS CBP funds go towards an awareness and training program, and assist with the all important collection of samples, in a region where travel is at best difficult, and in the monsoonal wet season nearly impossible. Samples are transported by motorbike over dirt tracks and roads, for transport by air to the capital Yangon for laboratory testing. Some samples continue their journey all the way to Pak Chong in Thailand for confirmatory testing in the regional FMD reference laboratory.

Public awareness is an important component of the southern Myanmar project. Pamphlets and booklets on FMD have been distributed to farmers' groups, posters have been displayed prominently on public billboards and the Livestock Breeding and Veterinary Department has organised a training program for farmers and livestock owners. Two farmers from each village participate in this training to gain an understanding of the beneficial impact of FMD control and to take this understanding back to their communities. The farmer training facilitates the collection of samples and information on the cattle being sampled, including vital data on the history of the cattle. The project also includes a training program for veterinary assistants to ensure that quality-assured samples are collected within the time frame of the project.

Contributed by: Ian Naumann, Director, SPS Capacity Building Program, OCPPO, DAFF.

Animal Health Committee report

REGULATION OF TESTING FOR EXOTIC PATHOGENS

Animal Health Committee have long recognised that reporting or publication of positive test results for exotic pathogens that have not been properly validated, could have serious, inappropriate and adverse consequences for Australia's animal industries, in terms of market access and trade in livestock and animal products.

Recently, Animal Health Committee finalised the *Guidelines for the Regulation of Testing for Pathogens Exotic to the Jurisdiction.* This document provides a common approach to managing and regulating the use of diagnostic tests for animal diseases of significance to Australia or to jurisdictions within Australia. These include diseases that:

- are exotic to Australia
- are not normally present within the jurisdiction
- do not normally occur within the species of animal
- are zoonoses.

The guidelines aim to ensure that only correct test results that truly represent the actual situation affect Australia's animal disease status. Three situations of particular concern are:

- The use of manufactured 'crush-side' or 'pen-side' tests in the field. These may range from simple card agglutination tests to sophisticated 'micro-arrays'. Results will normally be 'positive or negative' with some possibility of a qualitative grade of result.
- The use of simplified tests by a private veterinary or medical laboratory. Such laboratories are accustomed and equipped for high-volume throughput using automated or semi-automated test systems. Serum is the common tissue tested to demonstrate antibody titre. Testing is generally of a screening nature with little option for increasing validity with parallel or serial testing with more complex systems.
- Testing conducted as an element of research. This will commonly occur in an academic context and may involve complex test systems. These will often have a limited scope but may involve PCR technologies. Cost may reduce the number of samples tested and may mean that the extent of the study may be reduced (eg case-control studies where clinical observations limit the test numbers). Where zoonotic or highly infectious agents are involved there will be few opportunities for isolation, cell culture and characterisation.

When a positive result is obtained, that result should first be advised to a nominated Departmental officer, in accordance with normal reporting obligations for notifiable diseases. If the Department believes it is necessary to obtain confirmation of the result, further reporting, other than to co-workers within the same testing facility, must be deferred until the result is confirmed.

Prior to testing for an exotic animal disease agent, a government, non-government, commercial or research laboratory (including university laboratories) should obtain approval from the Chief Veterinary Officer of the jurisdiction.

A copy of the Guidelines is available from the Chief Veterinary Officers of each State and Territory or from the Animal Health Secretariat, DAFF.

Contributed by: Lyndel Post , AHC Secretariat

Australian Wildlife Health Network

In June, eWHIS (the web-enabled front end of WHIS [Wildlife Health Information System]) was launched by the Minister, the Honourable Senator Ian MacDonald at the International Wildlife Diseases Association conference in Cairns. eWHIS is a relational database that allows users to access information about wildlife disease events.

The first module is a 'First alert' system that allows users to track the progress of wildlife disease investigations around Australia. The second module, currently being built, allows users to interrogate and generate reports, and to export data for statistical analysis and mapping. A final module, due in 2007, will allow prediction of changes in wildlife disease occurrence and/or frequency.

The information contained in eWHIS is only available to AWHN members who have signed a confidentiality agreement with AWHN. If you would like access to this dataset please contact us (at awhn@zoo.nsw.gov.au).

MASS OR UNEXPECTED MORTALITIES OR MORBIDITIES OF UNKNOWN CAUSES

Reports of 'tens of thousands' of red kangaroos (*Macropus rufus*) dying from lumpy-jaw in West Australia from March this year cannot be substantiated (See AHSQ Vol. 10, No. 1). Evidence suggests however, that a mass mortality event did occur.

Multiple locations were involved, centred around Meekatharra, WA. Intelligence suggests a confirmed minimum of 3000 animals from a population estimated at 10000. No further deaths were reported after 3 March 2005.

Autopsies showed changes that could be ascribed to inanition (lumpy-jaw, *Salmonella* sp. isolated from gut, enteric parasites, gastric ulceration) (n = 5). In one animal, however histological intestinal changes suggestive of an undiagnosed syndrome were observed in the gut (detailed information available in eWHIS).

Little is known about mass mortality events in kangaroos. The kangaroo industry is worth $200M to Australia and it is important that a diagnosis be pursued where mass mortalities occur.

SUSPECTED EXOTIC AND OIE LIST DISEASES

A wild red fox (*Vulpes vulpes*) from Western Sydney was euthanised due to signs of central nervous system dysfunction. The fox had respiratory lesions consistent with canine distemper virus infection and cytoplasmic inclusion bodies present in adrenal gland and bronchial epithelium. Fixed tissues were forwarded to AAHL for Lyssavirus exclusion (no antigen detected) and canine distemper virus diagnosis (no immuno-histochemistry test available). Lyssavirus and distemper are not exotic diseases or OIE listed but testing was carried out to exclude rabies.

The presumptive diagnosis of distemper is a reminder of the role of wildlife in maintaining diseases of companion and production animals in the Australian environment.

Eight wild black swans (*Cygnus atratus*) from Lake Monger in WA showed pallor, crusting and multifocal ulceration of the beak and face, conjunctivitis and uveitis, with inflamed sclera and iridae, and bumblefoot. Some of the birds had elevated serum concentrations of liver enzymes consistent with exposure to a photosensitising agent. Testing to exclude avian influenza, paramyxoviruses and duck virus enteritis is underway at the AAHL.

SUSPECTED HUMAN/ZOONOTIC CONNECTION

Reports of granulomatous meningitis, suggestive of *Angiostrongylus cantonensis* infection, in three Tawny Frogmouths (*Podargus strigoides*) from the northern beaches area of Sydney were received. These birds act as an indicator species for the presence of *A. cantonensis* in the environment. This parasite may infect humans, often young children (via ingestion of infected snails or larvae released in slime trails on vegetables like lettuce), and cause neurological symptoms, from severe headaches to disease (eosinophilic meningitis) and death.

Pigeon (*Columba livia*) - feral, Sydney. The bird was emaciated and had fibrinous coelomitis and chlamydiosis, based on an antigen capture test. While pigeons are common carriers of Chlamydia, this is the first registry report of chlamydiosis in a wild animal in the Sydney area.

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

Aquatic animal health

NEW TEXT ADOPTED FOR THE 8TH EDITION (2005) OF THE OIE AQUATIC ANIMAL HEALTH CODE

The International Committee of the World Organisation for Animal Health (OIE) held their 73rd General Session in May and adopted a number of updates to the Aquatic Animal Health Code which is available free on the internet (at http://www.oie.int/eng/normes/fcode/en_sommaire.htm).

AQUATIC ANIMAL DISEASE LIST

Eleven diseases listed in the Aquatic Code (2004) were removed because they did not meet the disease listing criteria. These 'delisted' diseases include six diseases exotic to Australia: four fish diseases [Oncorhynchus masou virus disease, channel catfish virus disease, piscirickettsiosis (*Piscirickettsia salmonis*), and white sturgeon iridoviral disease] and two mollusc diseases (infection with *Haplosporidium nelsoni* and infection with *Haplosporidium costale*). Five diseases known to occur in Australia have been removed; these are two fish diseases [viral encephalopathy and retinopathy and enteric septicaemia of catfish (*Edwardsiella ictaluri*)]; two mollusc diseases (infection with *Mikrocytos roughleyi* and infection with *Marteilia sydneyi*); and one crustacean disease (spawner-isolated mortality virus disease).

Two previously listed fish diseases: infectious pancreatic necrosis and bacterial kidney disease (*Renibacterium salmoninarum*) (both exotic to Australia) and the two mollusc diseases, infection with *Mikrocytos mackini* (exotic) and infection with *Perkinsus olseni* (reported from some jurisdictions) were placed 'under study', because there was controversy as to whether they fully meet the criteria for listing. Three new diseases placed 'under study' include koi herpesvirus disease (exotic) and the two exotic crustacean diseases necrotising hepatopancreatitis and infectious myonecrosis. These seven diseases will be referred to *ad hoc* groups who will make recommendations to the Aquatic Animal Health Standards Commission on whether or not to include these diseases on the list in the Aquatic Code.

DISEASE CHAPTERS IN THE AQUATIC CODE

The International Committee adopted three disease chapters in the new format that had been adopted the previous year. These new chapters are on the fish disease, epizootic haematopoietic necrosis (reported from some jurisdictions); the exotic mollusc disease, infection with *Marteilia refringens* and the exotic crustacean disease, white spot. The new format allows for the listing of 'safe' commodities that when imported or transiting a country should not require any conditions with respect to that disease, regardless of the status of the exporting country, zone or compartment for the disease under consideration. The 2005 version of these chapters, makes provision for the listing of such commodities, but so far none have been identified. Ad hoc groups will meet later in the year to commence the risk analysis process and make recommendations to the Aquatic Animal Health Standards Commission.

The chapters also provide disease-specific details on the four pathways to self-declaration of freedom from the disease under consideration (i.e., absence of susceptible species; historical freedom; targeted surveillance with negative results; or regaining freedom after an outbreak).

Finally, there are recommendations for the importation of live animals and for aquatic animal products from a country (zone or compartment) declared free from the disease, and from a country (zone or compartment) not declared free. For live animals from a country (zone or compartment) not declared free, the recommended measures are different for animals destined for aquaculture activities than for animals destined for human consumption, because of the different levels of risk involved.

OTHER CHANGES

The International Committee also adopted:

- a number of modified definitions (e.g. for 'aquaculture')
- a new set of criteria for listing an emerging aquatic animal disease
- fine-tuned criteria for immediate notification of aquatic animal diseases
- minor changes to notifications and epidemiological information, and
- edits to general recommendations on disinfection.

These changes have increased consistency between provisions in the Aquatic and Terrestrial Codes.

A proposed appendix to the Aquatic Code on guidelines for aquatic animal health surveillance was withdrawn because of the number and technical nature of comments received from Member Countries. Aquatic experts and the Scientific Commission's ad hoc group on epidemiology will revise the draft appendix to ensure consistency with the terrestrial equivalent.

Contributed by: Eva-Maria Bernoth, OCVO, DAFF

State and Territory reports

New South Wales

Contributed by:
Barbara Moloney
NSW Agriculture

ANTHRAX

Twelve investigations were negative for anthrax during the quarter. Five of these involved sheep. The diagnosis in one case was mating injury in female lambs; animals were found dead with bleeding from rectum and vagina. Rams had access to these lambs and had been observed mating. The remaining seven investigations involved beef cattle, and a diagnosis of oxalate nephropathy was reported in one case (see separate report in this issue).

STRANGLES

There were three cases of strangles reported during the quarter. A single animal was affected in two of the cases (one being a horse in race training and the other a yearling) and two weanlings were affected in the third case, with one of the weanlings requiring euthanasia. In each instance the affected animal was isolated from other horses and treated with antibiotics, with no further cases reported.

EQUINE HERPES VIRUS ABORTION

There were two cases of abortion due to EHV1 reported during the quarter, with a single mare affected in both cases. An isolation protocol as recommended in the Australian Equine Veterinary Association guidelines has been followed. The affected mare was isolated and any in-contact mares are isolated in small groups until they foal.

HENDRA VIRUS EXCLUSION

A ten-month-old thoroughbred filly was found dead in June on a Tweed-Lismore property. It was one of a group of twelve horses that had been hand-fed the previous evening, and all had appeared normal. Post-mortem examination findings included cyanotic mucous membranes, frothy nasal discharge and frothy, slightly blood tinged discharge in the trachea and bronchi. As gross pulmonary pathology was suggestive of Hendra virus, samples that were collected for histopathology and sent to a local laboratory were forwarded to AAHL to rule out Hendra virus.

Flying foxes are thought to be the natural reservoir of Hendra virus. All previous cases of transmission to horses have occurred during the flying fox breeding season. In this case the nearest bat colony to the property was approximately 10km away, and it was not bat breeding season, therefore Hendra virus was not high on the list of differential diagnoses. The eleven remaining horses were examined, with no signs of illness detected apart from a slight clear nasal discharge in one animal. Hendra virus was excluded on the basis of epidemiology, pathology and laboratory findings. The cause of death remains undiagnosed.

TICK FEVER

During April, tick fever was diagnosed at two locations. In the northern Casino district there are five cattle tick-infested herds. One of these had 13 head lost from a group of 42 heifers over a period of several months; there are 800 head in total on the property. An initial diagnosis of tick fever was made on the basis of the presence of ticks, clinical signs and response to imidocarb treatment. Serological testing subsequently confirmed the presence of *Babesia bigemina* and *Anaplasma* spp.

In the northern Tweed-Lismore district there is a group of nine cattle tick infested properties. Tick fever, due to *Babesia bovis* and *Anaplasma*, was diagnosed by post-mortem tests and serology on two of these. Losses were five from 19 and three from 70. Cattle tick eradication programs are underway and susceptible stock in infected herds have been treated. Treated stock will become susceptible again as the effect of the treatment wears off. Cattle in other herds remain at risk until the cattle ticks are eradicated.

OXALATE TOXICITY IN CATTLE

Oxalate nephropathy was diagnosed during an investigation of 13 sudden deaths in seven to nine-year-old pregnant Shorthorn cows in a herd of 9000 from a property in the Nyngan district in May. The cows were grazing for three weeks on a short sparse pasture including roly-poly, saltbush and native gum grass without supplementary feeding. Twelve cows were found dead near water and the 13th collapsed and died the following day after moving to an adjacent paddock. Post-mortem examination of two cows showed a yellow swollen liver in one, and possible liver changes in the other. Of the surviving animals, one was found sick showing weakness, lethargy, jaundice and photosensitisation. Anthrax, blue-green algae and nitrate poisoning were excluded.

Blood samples taken from the sick cow showed mild elevation of liver enzymes and a severe increase in bilirubin, a marked azotemia consistent with renal failure, and high fibrinogen and hyperglobulinaemia indicative of an inflammatory response.

Histopathology of the cow with gross liver changes showed renal tubular necrosis with oxalate crystals in the renal tubules. Apart from bile accumulation, the liver changes were mild. In the other cow there was no significant hepatic or renal pathology. The death of one cow was attributed to oxalate nephropathy causing renal failure; the cause of death in the other cow was not established. The sick cow, showing renal azotaemia, would have suffered from oxalate nephropathy, as well as a concurrent problem of jaundice and photosensitisation suggestive of a hepatopathy. Although, under normal circumstances, poisonings don't occur in animals grazing on pastures containing saltbush or roly-poly, these plants can contain sufficient oxalate to cause nephrosis if eaten either in large quantities during a short period or in lesser amounts ingested during a long period.

VIRAL RESPIRATORY DISEASE IN FEEDLOT HEIFERS

Two heifers died and most of a group of 150 mainly Shorthorn heifers in a feedlot showed signs of respiratory disease. The yearling heifers had been on feed for one month when the outbreak started. Many cattle were coughing. Those examined were febrile with rapid respiration, profuse salivation, a mucous nasal discharge and serous lacrimal discharge. The main finding from post-mortem examination was a tracheitis with marked inflammation and a patchy diptheritic membrane. There was very little lung involvement.

No bacteria were cultured from the lung tissue and infectious bovine rhinotracheitis (IBR) viral isolation was negative. When first tested, one heifer was serologically positive for bovine respiratory syncytial virus (BRSV), two were positive to IBR virus and four were positive for Parainfluenza 3 (PI3) virus. On the second test all heifers had sero-converted to BRSV although the IBR tests remained unchanged and one additional heifer sero-converted to PI3 virus. BRSV is regarded as a benign respiratory pathogen. Pestivirus involvement cannot be ruled out although tests to date have been negative.

Northern Territory

Contributed by:
Dick Morton
DBIRD

LEAD POISONING IN CATTLE

Seven deaths occurred in a group of 80 mixed age cattle grazing native pasture on a property near Darwin. Deaths ceased two days after the cattle were moved to another paddock. Clinical illness was seen in three cattle before death. Nervous signs included dullness, depression and circling.

Post-mortem examination was unremarkable. Clinical chemistry showed elevated creatinine phosphokinase levels and hypophosphataemia. Examination of the rumen/reticulum contents yielded wire, bone and glass fragments, but no observable lead. Smears of spleen and brain showed no evidence of *Babesia* or *Anaplasma* spp.

Blood lead levels were 6.28 µmol lead/L. Greater than 1.7 µmol lead/L is consistent with lead toxicity and likely to be associated with clinical illness. A liver sample revealed 206.0 µmol lead/kg wet weight liver. Liver lead levels in normal animals are usually less than 10 µmol lead/kg.

A subsequent search of the paddock revealed old car batteries that showed evidence of recent chewing by cattle.

CATTLE TICK INFESTATION OF SUSCEPTIBLE HORSES.

Five polocrosse ponies from Victoria were kept in a holding paddock of an outer Darwin cattle export yard. No cattle had been in the paddock for some months. Within seven days all horses showed varying degrees of skin irritation from mild to severe urticaria. Two horses had very large oedematous ventral abdominal lumps. The horses were depressed. Close examination revealed a very heavy larval tick burden.

This observation confirms that horses, especially naive horses, are susceptible to cattle ticks (*Boophilus microplus*) and can develop a heavy burden of cattle ticks.

IODINE DEFICIENCY IN A PIGGERY

A piggery in rural coastal Darwin experienced stillbirths and weak neonatal piglets during a two month period. The piggery has 150 sows and during the period 30 litters out of 40 farrowings were affected. Sows generally appeared to farrow normally. However, most piglets in affected litters were born dead or very weak, trembling and dying within hours. Piglets that survived the first day went on to become apparently healthy. No deformed piglets were noted and mummies were few. Sows were in good condition, kept outside on dirt until farrowing, and fed exclusively locally baked bread.

Gross post-mortem examination findings in eight piglets from four separate litters revealed partial alopecia. There was moderate subcutaneous oedema of the head, neck, shoulders and forelimbs. Most piglets had scant to moderate blood-tinged fluid in the abdomen and thorax. Thyroid glands were prominent, being about the same diameter as the trachea.

Histological examination of various tissues was unremarkable, with no evidence of tissue necrosis or inflammation. Thyroid gland follicles appeared to be smaller than normal.

Bacterial culture, viral isolation and serology of appropriate tissues were unproductive.

The farmer was advised that the clinical syndrome was unlikely to be an infectious disease problem. Considering that the diet was limited to bread, and that the disease manifested in weak or stillborn piglets with anterior oedema and enlarged thyroid glands, a presumptive diagnosis of congenital hypothyroidism was made. The farmer was advised to add a multivitamin and mineral supplement to the diet. Addition of iodised salt to the diet resulted in immediate cessation of the clinical syndrome. The soil is likely to be iodine deficient as expected in a monsoonal area.

Queensland

Contributed by:
David Pitt
QDPI&F

CATTLE

Calf deaths occurred at various locations throughout south-east Qld and were associated with rotavirus (one), cryptosporidiosis (one), colibacillosis (one), and coccidiosis (three). *Salmonella* Gp D was responsible for the deaths of 12 one to two-month-old calves out of 50 at risk on a property in Nanango Shire during June. The early weaned calves were being fed on grain and had depression, diarrhoea, fever, and coma before death.

In May and June, three cattle from a recently established Mareeba feedlot died after a short illness. Post-mortem cultures revealed liver, lung, kidney and spleen samples from one animal positive for melioidosis (*Burkholderia pseudomallei*). The three animals originated from two properties and all three displayed haemoglobinuria, which is an unusual finding with melioidosis. Follow-up blood sampling at the feedlot (covering three properties including the two with affected animals above and a control property) and testing using complement fixation and indirect hemagglutination assays was done in an attempt to establish the source of infection. There was no difference between affected and control properties. By mid-June, the feedlot had about 6500 head of cattle from numerous sources with some feedlot company owned and the remainder contract fattened. Water source is via the Tinaroo Dam channel network. Most animals leave direct to slaughter at an abattoir with AQIS inspectors or return to property of origin. No other cases have occurred.

MANNHEIMEIOSIS

Mannheimia (Pasteurella) haemolytica was diagnosed as the cause of sickness and death in a group of 250 nine-month-old mixed sex cattle on a property in Monto Shire. One dead animal was autopsied and a further five were sick with respiratory signs. *M. haemolytica* and *Pasteurella* spp. were cultured from pneumonic lung tissue and the former was considered the most likely cause of the lesions observed.

BABESIOSIS

Babesia bovis infection was diagnosed in one animal in a herd of 20 cattle at Woodstock in Thuringowa Shire. The four year old animal had jaundice, fever and ill-thrift.

Sickness and death due to *Babesia bovis* infection was diagnosed on seven properties in central region Shires of Banana, Broadsound, Belyando, and Fitzroy during the quarter. Generally, only a couple of animals in the mob were affected, showing signs ranging from depression, salivation, discoloured urine, fever and jaundice to sudden death. Most cases showed significant parasitaemia with *B. bovis* on examination of blood smears. This is a reflection of favourable summer rainfall in these Shires leading to a significant increase in the cattle tick population during summer, peaking during a warm autumn/early winter period.

COCCIDIOSIS

A property in Fitzroy Shire had ten sick and one dead animal from a group of 250 six-month-old calves. Signs included diarrhoea, haemorrhage and fever. A property in Livingstone Shire had eight animals with diarrhoea and one dead animal from a group of 400 male cattle of unspecified age. Faecal samples from sick animals in each case revealed significant numbers of *Eimeria zuernii* oocysts.

Coccidiosis and interstitial pneumonia of unknown aetiology were associated with the deaths of two six-week-old calves out of 15 at risk on a property in Caboolture Shire. Clinical signs of coughing, mucopurulent nasal discharge, diarrhoea, lethargy and depression were recorded before death.

SUSPECT CONGENITAL ANOPHTHALMOS

A Hereford calf was born without apparent eyes. The brain and remnants of tissue from the orbits were submitted to the laboratory. Examination of the brain revealed hypoplasia of the optic tracts and histological examination of the material from the orbits failed to demonstrate eye tissue. Anophthalmos is very rare. In many cases severe microphthalmos is mistaken for anophthalmos until some vestige of eye tissue is found on serial sections of orbital tissue.

PASPALITREM TOXICITY IN WEANER CATTLE

Toxicity from *Claviceps paspali* ergot bodies infecting seed heads of a paspalum pasture was considered the likely cause of neurological signs in a mixed breed group of 110 weaners on a property on the Qld/NSW border. Ten to 15 weaners had clinical signs of staggers and hypermetric gait with periodic recumbency. Stress of handling exacerbated clinical signs. The fungi were identified by a Department of Primary Industry & Fisheries plant pathologist. Biochemical and haematological results on six animals were unremarkable.

Nitrate poisoning caused the deaths of two cattle out of 140 head at risk near Monto in late May. The cattle were on rye grass pastures containing 5.40 % KNO_3 equivalent in dry matter. Aqueous humour from one dead animal contained 55.0 mg nitrate/L. Nitrate poisoning also caused the deaths of three cows out of 30 head strip grazing fresh oats in Boonah Shire in early June. In this case, the oats contained 4.30 % KNO_3 equivalent in dry matter and the aqueous humour from a dead animal contained 58.0 mg nitrate/ L. Deaths in dairy cattle due to nitrate poisoning were recorded in June in Ipswich City, Beaudesert Shire and Pine Rivers Shire.

Three cattle from a herd of 120 died on an Ayr Shire property with photosensitisation especially on the nose area. A post-mortem examination revealed jaundice, enlarged liver and distended gall bladder. There were increased concentrations of bilirubin, GGT and CPK in serum. Histological examination revealed enlarged hepatocytes with a pale granular cytoplasm, cholestasis with bile in hepatocytes, Kupffer cells and bile canaliculi. The biochemistry and histopathology are consistent with *Lantana camara* toxicity and the plant was found growing thickly at nearby rivers and creeks.

HELMINTHIASIS IN CATTLE

A property in Broadsound Shire had eight-month-old calves with signs of diarrhoea. Faecal samples from nine calves had faecal egg counts of up to 3250 epg, with larval culture revealing primarily *Cooperia* spp, but also *Haemonchus* and *Oesophagostomum* spp.

Faecal samples from nine calves with signs of diarrhoea and ill-thrift from a property in Sarina Shire revealed helminthiasis with egg counts up to 800 epg and larval culture indicating primarily *Haemonchus* spp but also *Cooperia* and *Oesophagostomum* spp.

SALMONELLA INFECTION IN HORSES

A 12-week-old stockhorse foal from a property in the Sarina Shire had diarrhoea, fever, weakness and dehydration with discolouration of mucous membranes. *Salmonella waycross* was isolated from faecal cultures. A significant burden of *Strongyloides* spp. was also noted on faecal examination.

LANTANA POISONING IN GOATS

Lantana poisoning was presumed to be responsible for the deaths of two female goats and sickness in another one out of 40 at risk in Caloundra Shire in late May. Clinical signs included erosions and ulceration around the vulva and perineum, lethargy, anorexia and reluctance to move out of shelter and one was markedly icteric and had a swollen tongue. Serum biochemistry revealed hypocalcaemia, marginal hypoalbuminemia, marginally elevated globulins and elevated urea/bilirubin/GGT. Cholestasis and tubular nephrosis were found and are consistent with lantana poisoning.

HELMINTHIASIS IN GOATS

Helminthiasis due to *Haemonchus* sp. and *Trichostrongylus* sp. caused the death of one goat and sickness in two others out of 30 at risk in Brisbane City in mid-June. Clinical signs were severe lethargy, anorexia, anaemia and severe diarrhoea and faecal egg counts were 8550 epg. A faecal egg count of 1000 epg *Haemonchus* spp. was found on faecal examination in one of two sick goats from a property in Banana Shire. A faecal egg count of 8100 epg *Haemonchus* spp. was the likely cause of anaemia, bloat, oedema and weight loss in one of 70 goats on a property in Livingstone Shire.

South Australia

Contributed by:
Celia Dickason
PIRSA

SUSPECTED EXOTIC DISEASE EXCLUSION INVESTIGATION IN LAMBS

A producer near Coonalpyn had some lambs that developed skin lesions that were described as blister-like and were first noticed when the lambs were about two weeks old. On examination there were 10-15 affected lambs. The lambs were bright and alert and in good condition. The lesions were predominantly on the sides and more frequent towards the rear. The clinical appearance of the lambs allayed fears of the exotic disease sheep pox, especially as the lesions appeared to be consistent with dermatophilosis with secondary bacterial infection. Dermatophilosis is unusual in lambs of this age, especially as there had been no break in the dry season to facilitate spread of the disease.

A range of samples was collected from the lambs. Histopathological examination revealed an exudative dermatitis with intense hyperkeratosis and numerous

bacteria consistent with *Dermatophilus* and secondary bacterial and fungal colonisation. Culture for *Dermatophilus* was unrewarding owing to the overgrowth of other bacteria. Electron microscopy of the lesions found particles consistent with parapox viral morphology (scabby mouth) that conclusively ruled out sheep pox.

LEAD TOXICITY CAUSES CATTLE DEATHS

A beef producer on the Yorke Peninsula lost 13 out of 70 cattle in less than two weeks following an outbreak of neurological disease. Initially, only one cow was affected, with signs including salivation, weakness, twitching, recumbency and teeth grinding. Other cattle started showing signs the following day that initially included mild weight loss, salivation and depression and progressed over two days to include the same signs as the first cow, as well as blindness, convulsions and death. Scouring was not observed. Affected animals were aged between four months and six years, and were previously in good health. Several cows were in late pregnancy.

The outbreak had occurred after the cattle were fed hay in an area of the paddock adjacent to the former site of a tramway. Cattle were not usually fed in this area. Contamination of former railways and tramways with heavy metals is known to occur. This information, combined with the signs shown led to a provisional diagnosis of lead toxicity. Other possible causes included polioencephalomalacia, plant toxicity and the head and eye form of malignant catarrhal fever.

Two cattle were submitted for post-mortem examination as part of the National Transmissible Spongiform Encephalopathy (TSE) Program. The only gross sign visible was mild ulceration of the jejunum in one cow. No histological changes were noted and both cattle tested negative for TSE. Blood lead levels that were three times greater than the normal maximum, as well as high tissue lead concentrations confirmed a diagnosis of lead toxicity.

PIMELEA POISONING IN CATTLE IN THE FAR NORTH

An extensive beef producer in the far north of the state reported deaths of up to 30 cattle at mustering. Cattle were described as being lethargic, emaciated, scouring and having submandibular or brisket oedema. Affected cattle were first noticed after a summer storm had encouraged some plant growth. An affected yearling steer was sacrificed for post-mortem examination. Grossly, the liver was swollen, the kidneys pale and there was 500mL of pale yellow fluid in the chest cavity. The lungs were congested and the heart was enlarged, with a flaccid right ventricle. *Pimelia simplex* was found in the vicinity.

Haematology showed a poorly regenerative anaemia, and a neutropaenia with metamyelocytes. Histologically a wide range of lesions could be seen, including atrophic diffuse cardiomyopathy, interstitial pneumonia, lymphangiectasia, hepatopathy (characterised by central vein dilation and duplication, sinusoidal dilation and vascular channel formation), arteriolar hypertrophy and diffuse lymphoplasmacytic/ eosinophilic enterocolitis. The findings were considered consistent with pimelea poisoning.

PERENNIAL RYEGRASS STAGGERS IN CATTLE

In late April a producer near Tantanoola in the south-east ceased dairy farming and moved into a beef production operation. Because of the change in management, he restricted the amount of water he applied to his centre pivot grazing paddocks. This limited watering occurred for a period of six weeks before the beef animals being introduced. The predominant grass in the irrigated areas is perennial ryegrass. The watering pattern and weather combined caused a high concentration of endophytes to accumulate providing outbreak conditions. At the end of May approximately 10% of some weaner steers and approximately 10% of a mob of adult cows were discovered exhibiting clinical signs of involuntary tremors, incoordination and staggers. These clinical signs were consistent with perennial ryegrass staggers. The animals were removed from this grazing area. A PIRSA Veterinary Officer, together with a local independent agronomist visited the property. They collected samples of the perennial ryegrass and sent them for ergovaline and lolitremB analysis. The results showed that the levels of toxins were low. The conclusion was that, whilst the producer had a significant number of animals affected with perennial ryegrass staggers, the advent of rainfall at the end of May corrected the problem and the pastures were once again safe for grazing.

BACKYARD POULTRY

A small number of back yard poultry problems are examined throughout each year, with most presenting as wasting due to worms or coccidiosis. With many birds being on grain-only diets, Vitamin A deficiency is regularly seen in the autumn period, particularly when the seasonal break is delayed and green pick is not available.

Marek's disease is frequently seen, coinciding with the introduction of a new genetic line. This disease is difficult to control when natural brooding is used, as the vaccine needs to be administered before contact with the virus occurs. Vaccine is also not available in the quantities suited to small flock administration.

AVIAN ENCEPHALOMYELITIS AND EGG DROP

A commercial egg farm reported an egg production drop in three flocks of birds. It occurred in one flock and was followed about a week later in the other two flocks. There were no signs other than the decline in egg production. Infectious bronchitis may cause an egg drop in poorly immunized flocks, but these flocks had been vaccinated at the required eight to ten weeks of age. The history of the flocks indicated that they were vaccinated for avian encephalitis (AE) by administration of the vaccine to 25% of the flock while on the ground, but in this case they had been vaccinated only four to five weeks before being placed in cages. Paired sera taken three weeks apart indicated a substantial rise in the AE titre, confirming that the egg drop was probably due to an AE challenge.

Tasmania

Contributed by:
MaryLou Conway
DPIWE, Tasmania

PESTIVIRUS IN CATTLE

Abortion, neonatal death and poor growth were recorded in a herd of 27 heifers. Of 27 'births', 16 calves survived past weaning. The survivors were small for their age, had rough, dry coats, and chronic diarrhoea despite treatment for internal parasites. The remaining calves were positive for pestivirus by serology.

CHRONIC NECROTIC ENTERITIS IN FREE-RANGE LAYING HENS

A free range layer flock recorded 25% mortality in 60 recently introduced point of lay hens and poor egg production for the entire flock of 300 birds during a three week period. No mortalities were recorded in the home bred point of lay birds or older hens during this time. Chronic necrotic enteritis was diagnosed on histopathology, probably associated with stress and poor digestive adaptation to the free-range diet.

CALCIUM/PHOSPHORUS IMBALANCE IN FARMED QUAIL

A vertically integrated quail unit recorded up to 85% mortality in growers followed by a similar reduction in egg hatchability during a period of three months. Clinical observations of affected chicks included reluctance to move, enlarged joints and soft beaks. Osteodystrophia fibrosa was diagnosed on histopathology. Low hatchability was related to deaths occurring late in incubation. A mix-up in the adult and grower ration formulation appears to have led to both groups being affected.

Osteodystrophia fibrosa occurs as a result of hyperparathyroidism. This is usually stimulated by an imbalance in the calcium to phosphorus ratio, in the order of 1:3 (Ca:P), and may be due to an absolute or relative calcium deficiency. As skeletal deformities are likely to remain in the affected birds following dietary rectification, it is not recommended that any be kept, other than for slaughter as meat birds.

COOCIDIOSIS IN AN ALPACA

Coccidiosis is not commonly reported in alpacas. In this case, severe intestinal coccidiosis was found in a mature alpaca that died suddenly four weeks after arriving in Tasmania from interstate. Heavy invasion of the mucosal lamina propria of the small intestine and caecum by a coccidial parasite was observed on histopathology. The infection was uniformly in a stage of sexual multiplication, with microgamonts and macrogamonts/oocysts present, indicating a synchronised infection. The infection was very close to breaking out from the lamina propria and at that time, severe clinical disease could have been expected.

Although the coccidiosis was probably not the cause of death, it is likely to have acted as the portal of entry for enteric bacteria resulting in a bacterial septicaemia, shock and death. Considering the history of recent introduction, the source of the infection is uncertain. If acquired in Tasmania, the synchronised nature of the infection indicates heavy contamination of the environment.

LABORATORY ACCESSIONS AND NOTIFIABLE DISEASES

During the quarter, there were 107 aquaculture accessions, 499 livestock accessions, 76 companion animal accessions, 59 wildlife accessions and eight accessions from other sources. The following investigations into possible cases of notifiable diseases were undertaken during the quarter:

Disease	Investigations	
	+ve	No.
Avian Psittacosis	0	1
Brucella ovis	0	25
Johne's disease	10	69
Leptospira hardjo	0	10
Leptospira pomona	0	14
Listeria	0	1
Macrocyclic lactone anthelmintic resistance	3	3
Marine aeromonad disease	9	23
Piscirickettsiosis	0	2

Victoria

Contributed by:
Tristan Jubb
DPI, Victoria

ACORN POISONING OF CATTLE

In March, eleven heavily pregnant cows died in a mob of ninety, autumn-calving, Angus-Hereford cross cows on a farm to the east of Melbourne, after drinking from a water trough shaded by an oak tree. To provide extra water and shade during a period of very hot weather, the cattle had been given access to a paddock in which the trough was located. The trough contained stagnant water, oak leaves and green acorns. The following morning, five cows were found dead adjacent to the trough, with blood oozing from their orifices. Several others were moribund and did not respond to calcium, magnesium and phosphorus injections. Anthrax was ruled out by examination of blood smears. Autopsy revealed massive perirenal oedema and histologically there was acute renal tubular nephrosis. In serum there was a marked azotaemia and hypocalcaemia. The surviving stock was shifted to another paddock, however, during the next week, another six animals died. The survivors calved one month later with no further problems. The rapid death of some of the cattle was explained by them being thirsty in the hot conditions, making them drink large quantities of the water. Hydrolysable tannins were isolated from the trough water.

Acorn poisoning usually occurs in ruminants when large quantities of young oak leaves are eaten in spring or green acorns are eaten when they fall in autumn. The toxicity of acorns and oak leaves is usually ascribed to their tannins although there is some uncertainty that tannins alone are sufficiently nephrotoxic to cause 'acorn poisoning'.

SUSPECTED ZINC TOXICITY IN DAIRY CATTLE

During April, cattle in a 150 cow dairy herd near Echuca in northern Victoria began to scour and lose weight; milk production dropped markedly and two cattle died. About 20% of the herd developed severe weight loss and haemoglobinuria. Blood samples from affected cattle showed a severe regenerative anaemia. Necropsies and laboratory examination of the dead cows concluded that a primary haemolytic anaemia had occurred, causing severe hepatic necrosis.

The severe clinical syndrome started about a month after the introduction of a pelleted feed ration and shortly after the start of feeding some mouldy silage. The syndrome continued after silage feeding ceased however, and only stopped when pellets were sourced from another company. The history revealed that additional zinc had been added to the pellets, possibly in toxic amounts. Toxic concentrations mentioned in the literature vary considerably, but around 1000 ppm in feed seems to be the dietary concentration at which serious problems occur. It was subsequently found that they contained 4 600 mg zinc/kg. Serum zinc concentrations in the cows ranged from 23.7 to 40.4 µmol/L, exceeding the normal upper limit of 25 µmol/L. Liver concentrations of zinc in one of the cattle were markedly elevated at 5.08 mmol/kg, exceeding the normal upper limit of 0.5 mmol/kg.

Previous studies in ruminants have demonstrated haemolytic anaemia as a consequence of zinc toxicity. Poisoning circumstances in cattle and sheep have included overdoses of zinc oxide for the control of facial eczema, zinc sulphate for footrot control, the use of galvanised containers for feed, and pasture contamination from ore smelters. Reported clinical signs vary with dose and can include inappetance, loss of condition, decreased milk yield, diarrhoea, weakness, submandibular oedema, diarrhoea, jaundice and anaemia with haemoglobinuria. The most frequent pathological finding is severe acute exocrine pancreatic necrosis. Unfortunately in this case, pancreas was not available for examination.

REDUCED FERTILITY AND ABORTIONS IN SHEEP

Mouldy silage was suspected of causing an outbreak of reduced fertility, abortions in ewes, increased perinatal mortality, and mild deformities in lambs on a property near Edenhope in north-west Victoria.

Rams were removed from a flock of 400 ewes in February and ewes were subsequently fed silage, some of which was mouldy. The flock was ultrasonically scanned for pregnancy in early March and 140 ewes were found not pregnant but with a fluid filled uterus. From around this time many of these ewes came into oestrus again, sometimes immediately after aborting foetal membranes. Investigation by a private veterinarian failed to identify *Brucella ovis*, *Campylobacter* spp., or *Listeria* sp. as a cause. Mouldy silage was submitted for analysis and the zearalenone-producing mould *Fusarium oxysporum* was identified. Soil analysis performed previously had identified a mild selenium deficiency, but the sheep had been given a selenium-containing drench before joining.

In early April, the ewes detected as pregnant at scanning were beginning to abort. Ewes in the first group that aborted or were not detected pregnant, were scanned again, and 95 of 140 were still not pregnant, despite running with rams for a further three months. Some ewes with twins aborted one lamb, usually much smaller, and gave birth to a normal, viable lamb. About

8% of lambs were born with mild joint deformities. Three foetuses were submitted to PIRVic Attwood during May but no definitive cause of abortion was found.

In the absence of an infectious cause, the feeding of mouldy hay appears the most likely cause of the abortion storm. The cases of abortion or resorption – depending on the stage of pregnancy – commenced shortly after the feeding of the mouldy silage, and the mould is known to be able to produce a toxin that appears to cause abortions, genital hypertrophy and decreased subsequent fertility, along with occasional mild deformities.

PERENNIAL RYEGRASS STAGGERS IN SOUTH-WEST VICTORIA

During autumn, across Victoria, several thousand sheep died and thousands more were affected with staggers and hyperthermia from perennial ryegrass toxicosis (staggers) with the south-west region most affected. The conditions of rain in February with associated pasture growth, followed by dry conditions and a few hot April days, caused a high concentration of endophytes to accumulate in perennial ryegrass pasture providing outbreak conditions in late autumn. Many deaths were a direct result of ingestion of lethal concentrations of endophyte toxins; however some deaths were the result of sheep drowning in dams when seeking relief from the endophyte alkaloid-induced heat stress. Young sheep were most susceptible to staggers. Many graziers delayed shearing and pre-lambing drenching to avoid handling stock to minimise further deaths. Supplementary feeding was a challenge in affected mobs.

AN UNUSUAL OUTBREAK OF PASTEURELLOSIS IN CAGED LAYERS

A poultry farmer had two unusual outbreaks of mortality on his property that had three sheds containing about 11 000, 11-week-old caged pullets. The first incident occurred in early June, when there was 10% mortality over a few days in a particular area of one shed. Live and dead birds were submitted for autopsy where lesions of excess pericardial fluid with fibrin, pale two to four mm spots on the liver, subserosal haemorrhages and petechial haemorrhages on serosal surfaces were noted in most of the dead birds but not the live ones. *Pasteurella multocida* was recovered in pure culture from all of the dead birds cultured but not from the live ones. Histology showed acute focal necrosis of the liver with infiltration of heterophils and the presence of gram negative coccobacilli.

The next incident was similar, occurring three weeks later in a different shed with similar autopsy and histological findings and recovery of *Pasteurella multocida* from all dead birds that were cultured. Again, the live cage-mates of the dead birds were negative for lesions and bacteria.

These incidents are an unusual presentation of pasteurellosis in that the disease usually occurs in free range chickens and is spread by pecking pasteurella-infected carcases, not as in this case, in caged birds where this means of spread is restricted.

After the first outbreak, it was hypothesised that the feed had been contaminated by pasteurella-infected carcases of rats, mice or pigeons as the feed had not been heat-treated. Removal of the feed had an immediate response and the mortalities ceased abruptly. On the second occasion, the mortalities ceased abruptly without the feed removal.

MILIARY HEPATITIS ASSOCIATED WITH AN EGG PRODUCTION DROP IN FREE RANGE HENS

An unusual presentation of miliary hepatitis causing a significant drop in egg production occurred on a free range poultry farm on the Mornington Peninsula. The owner submitted six live, sick birds and two dead birds for examination after experiencing a 30% drop in egg production. Mortalities had only slightly increased. Autopsy showed numerous pale spots in the liver in six out of the eight. The differential diagnoses were pasteurellosis, salmonellosis and miliary hepatitis. Aerobic cultures on three birds proved negative for pasteurellae and salmonellae. Histology showed typical lesions of miliary hepatitis. Special stains did not reveal organisms.

Miliary hepatitis is an ephemeral and sporadic cause of death in laying chickens. The disease is characterised by a short period of illness and rapid death in laying birds. It is usually associated with rearing and housing of the birds on the floor but has been known to occur in cage-housed birds. There is an apparent seasonality with the problem occurring mainly in the warmer months in a number of states including Victoria, NSW and Qld. The losses from mortality can be up to 10% over a few weeks. The disease responds to treatment with antibiotics indicating a possible bacterial cause. Small white or yellow spots in the livers are consistently found during necropsies but bacteria are not observed or able to be cultured by conventional diagnostic means. Histopathology shows focal hepatocellular necrosis with a minimal infiltration of granulocytes. Special staining techniques for detection of microorganisms consistently fail to reveal an infectious agent. In this case the mortalities did not increase after antibiotic treatment and production was recovering. This appears to be an unusual manifestation of miliary hepatitis where an egg drop was detected but without a significant increase in

mortalities.

TYZZER'S DISEASE IN ALPACAS

Tyzzer's disease, a common cause of death in rodents, was responsible for the sudden death of two crias in a quarantine facility in Gippsland. Initially, soft faeces were observed that were culture–negative for *Salmonella*. Medication with a commercial anti-diarrhoea product produced a temporary improvement. The crias were then separated from their dams and unexpectedly, both of them died during a two day period. No gross findings were detected during autopsy except for mild ascites and liver atrophy in one cria. Bacteriological cultures, including for *Salmonella* and *Yersinia* were undertaken but no organisms were recovered. Histopathology revealed typical Tyzzer's disease lesions consisting of multifocal hepatocellular necrosis with a mild inflammatory response of neutrophils and macrophages. Silver staining demonstrated beaded, filamentous bacilli typical of Tyzzer's disease in the cytoplasm of the hepatocytes adjacent to the necrotic foci. The disease is caused by *Clostridium piliforme* and has been reported in alpacas in the Americas. The organism cannot be cultured by conventional means so the diagnosis is usually made on histopathological findings. Histopathology of the small intestine of one cria showed mild crypt necrosis, small numbers of eosinophils and infestation with nematodes of *Strongyloides* spp but it was unclear whether they played a role in predisposing these animals to Tyzzer's disease.

COPPER DEFICIENCY IN WALLABIES

In a research mob of tammar wallabies in outer suburban Melbourne, three joeys were killed after showing neurological signs including apparent blindness. Histological examination of the brains showed lesions consistent with those seen in congenital ataxia due to copper deficiency in ruminant species. Liver copper concentrations were very low. Subsequent laboratory investigations revealed low blood copper concentrations in six adult wallabies and low liver copper in one adult. A literature review suggests normal liver and blood copper concentrations may be lower in marsupials than in other herbivores.

Western Australia

Contributed by:
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SURVEILLANCE ACTIVITIES AND NOTIFIABLE DISEASES

Laboratory testing was conducted on 246 investigations of animal disease during the quarter. Five category C (discretionary quarantine) disease incidents were reported during the quarter. There was one case of infectious bovine rhinotracheitis and four cases of malignant catarrhal fever in cattle (sheep associated). There were two category 1 alerts (low index of suspicion). They involved the exclusion of Australian bat lyssavirus in a microbat and west Nile virus in a horse.

THROMBOTIC MENINGO ENCEPHALITIS

Thrombotic meningoencephalitis was diagnosed in a 10-month-old calf from Waroona that was presented recumbent, pyrexic, with 'rough lung sounds' and a nasal exudate. Histopathological examination of its brain found severe purulent meningoencephalitis with bacterial thrombi within meningeal and cerebral arterioles. The likely bacterial candidate, *H. somni* was not isolated from its brain.

SPORADIC BOVINE ENCEPHALOMYELITIS

Sporadic bovine encephalomyelitis was suspected to be the cause of poorly performing and severely wasted heifers on lush pasture at Gingin**.** Autopsy of one of these cattle revealed fibrinous pericarditis, purulent meninges and severe histopathological lesions in the meninges, brainstem and cerebrum. The heifer was serologically positive to *Chlamydia* with a complement fixation test positive at a serum dilution of 1:64.

CEREBELLAR ABIOTROPHY

Cerebellar abiotrophy was diagnosed in a two-year-old Friesian heifer from Brunswick that was imported as an embryo from the United States of America. As the animal grew, intention tremors and proprioceptive defects became more obvious and it was eventually euthanised due to welfare concerns. It was uncertain whether the clinical signs observed were present from birth. Histopathological examination of its cerebellum found universal and almost complete absence of Purkinje cells. Cerebellar abiotrophy and hypoplasia have similar histopathological appearance but the latter condition is due to extrinsic factors such as *en utero* infection with pestivirus whereas abiotrophy results from intrinsic metabolic factors. Without further information it is difficult to distinguish between the two conditions.

NEONATAL ENCEPHALOMALACIA

Neonatal encephalomalacia was diagnosed in one of several ill-thrifty Brahman calves on Northampton farm. Four of forty calves died within the first week of

life. Some calves apparently could not suckle. Autopsy of one calf found no macroscopic lesions but histologically there were multiple areas of acute malacia indicating a process secondary to the more chronic ill-thrift.

SALMONELLOSIS

Necrotising abomasitis and enteritis were diagnosed in two of 45 neonatal calves at Capel. Four of these calves had died within seven days and another two were described as sick. Histological examination of tissues from one calf revealed mucosal erosion accompanied by haemorrhage and oedema with thrombi present in mucosal, sub mucosal and deeper vessels in both organs. The problem was attributed to salmonellosis but could not be confirmed, as bacterial culture plates were overgrown by contaminants.

Salmonellosis was the cause of death in a group of four to seven day old dairy calves that were scouring and dehydrated at Busselton. *S. bovis morbificans* had been isolated previously in an adult animal two months earlier and again from six of seven faecal samples from affected calves.

MUCOSAL DISEASE

Mucosal disease was diagnosed in a heifer from Mt Manypeaks where 10 out of 150 animals had died following episodes of diarrhoea and coughing. At autopsy there were mild erosive lesions in the oesophagus and rumen and the caecal wall was markedly thickened with mucoid exudate adhering to the mucosa. Haemorrhagic focal lesions were present in the colon. Microscopically there was severe crypt epithelial necrosis and haemorrhage into the superficial lamina propria. The diagnosis was supported by a positive pestivirus antigen capture ELISA.

PNEUMONIA

Pneumonia due to *Pseudomonas aeruginosa* was diagnosed in 12-month-old heifers in a Busselton feedlot. Ten out of 1000 cattle had died and another 50 showed respiratory signs. Autopsy of one animal revealed advanced pneumonic lesions characterised by large irregular areas of coagulative necrosis bordered by zones of bacteria and inflammatory debris. Additionally there was marked thickening of the pleura and the interlobular septa were dilated by serofibrinous exudate, fibrous tissue and dilated lymphatics that contained fibrinous clots. Surprisingly culture of lung sections yielded pure and heavy growths of *Pseudomonas aeruginosa* rather than the expected *Pasteurella*, *Mannheimia* or *Haemophilus* spp. Similar focal lesions were evident in the liver but present were septate branching fungal hyphae consistent with *Aspergillus* sp, suggesting that the hepatic lesions may have spread from rumenitis that went undetected at autopsy.

A Brahman steer at Derby was diagnosed with severe and chronic bronchopneumonia with marked obliterative bronchiolitis. Evident in the reticulum were multiple, well demarcated areas of superficial epithelial erosion with necrosis. Although the pneumonia was considered a typical chronic bacterial lesion, legions in the reticulum resembled those seen in 1991 in 'Black Soil Blindness' a mycotoxicity due to *Corallocytostroma ornicopreoides* infection of Mitchell grass. A subsequent inspection of the area the steer came from did not find Mitchell grass

SEVERE RUMENITIS

At Esperance, two adult cattle fed supplementary grain died from severe rumenitis and in one, there was severe pulmonary abscessation following aspiration of rumen content. The presence of microscopic vascular lesions characterised by segmental fibrinoid necrosis in both rumen and lung suggested that malignant catarrhal fever might have been the primary cause of the problem. Viral antigen could not however be detected in a blood sample taken from the animal.

RENAL TUBULAR NECROSIS

Renal tubular necrosis due to unknown causes has been investigated on two properties, one at York and the other at Bindoon. On the York property, two of fifteen Murray Grey heifers died following a period of weight loss, rumen stasis and recumbency. Routine histological examination of kidneys revealed widespread acute to sub-acute tubular epithelial necrosis involving both cortical and medullary tubules. Blood taken from a third sick animal and two others revealed a markedly elevated plasma creatinine, indicating those animals were in renal failure. A plant toxin was suspected but a careful search of the property failed to locate any likely species. On the Bindoon property, the problems have continued since March with 15 of 32 Simmental heifers dead. Animals initially lagged behind the herd then rapidly lost weight during a three to four week period, followed by polydipsia, polyuria and death. The history is complex but affected animals were only in one group and then only in heifers that had calved. The mobs were rotated so other groups of cattle have had exposure to the same feed and paddocks but have not been affected. Histologically there are always renal lesions characterised by renal tubular necrosis and tubules that contain necrotic debris and degenerate neutrophils. Once again a plant toxin is suspected but likely candidates were excluded.

Quarterly Disease Statistics

Quarterly disease statistics — control activities

OVINE BRUCELLOSIS

Contagious epididymitis, caused by *Brucella ovis*, is present in commercial flocks at a low level that varies around the country. Voluntary accreditation programs (usually in stud flocks) for ovine brucellosis freedom are operating in all States. Table 1 shows the number of accredited flocks at the end of the quarter.

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

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 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. Table 3 summarises results from the program.

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 4 shows the number of hers 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, goat and alpaca with the number of herds or flocks that have reached a status of Monitored Negative 1 (MN1) or higher shown in Table 5.

(Continued on page 23)

Table 1: Ovine brucellosis accredited-free flocks at 30 June 2005

NSW	NT	QLD	SA	TAS	VIC	WA	AUS
581	0	62	491	283	606	147	2170

Table 2: Dairy herds tested free of enzootic bovine leucosis at 30 June 2005

	NSW	NT	QLD	SA	TAS	VIC	WA	AUS
Free	1056	0	900	410	525	6182	360	9433
Herds	1074	0	906	411	525	6230	360	9506

Table 3: Results of the National Granuloma Submission Program

	Granulomas submitted	TB +ve
Apr – Jun 04	1188	0
Jul – Sep 04	1075	0
Oct – Dec 04	1184	0
Jan – Mar 05	650	0
Apr – Jun 05	760	0

Table 4: Herds/flocks with JD at 30 June 2005

	Cattle	Sheep	Goats	Deer	Alpaca	Total
NSW	127	1286	11	1	0	1425
NT	0	0	0	0	0	0
QLD	1	0	1	0	0	2
SA	28	66	1	2	0	97
TAS	18	53	0	0	0	71
VIC	1033	377	9	7	**0**	1426
WA	0	18	0	0	0	18
AUS	1207	1800	22	10	0	3039

Table 5: Herds/flocks with a JDMAP status of at least MN1/TN1 status at 30 Jun 2005

	Cattle	Sheep	Goat	Alpaca	Total
NSW	652	473	55	99	1279
NT#	0	0	0	0	0
QLD#	0	0	0	0	0
SA	282	236	17	39	574
TAS	106	31	1	1	139
VIC	313	78	1	21	413
WA#	0	0	0	0	0
AUS	1353	818	74	160	2405

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

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

Table 6: Surveillance for bovine brucellosis

	Abortion investigations		Test for other reasons	
	Tests	+ve	Tests	+ve
Apr – Jun 04	231	0	3025	0
Jul – Sep 04	187	0	795	0
Oct – Dec 04	247	0	3502	0
Jan – Mar 05	358	0	796	0
Apr – Jun 05	253	0	1748	0
NSW	47	0	172	0
NT	0	0	363	0
QLD	119	0	363	0
SA	0	0	1	0
TAS	6	0	16	0
VIC	7	0	126	0
WA	74	0	707	0

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 7.

Table 7: 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
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
Jan – Mar 05	5251	536	5764	194	1610	278	3233	8	481	5	278	12
Apr – Jun 05	2984	583	4354	288	1458	356	2874	0	570	3	253	8
NSW	322	165	557	75	390	110	561	0	228	0	142	8
NT	528	242	622	177	539	145	418	0	0	0	0	0
QLD	400	176	319	31	320	100	28	0	172	3	3	0
SA	593	0	615	0	13	1	1538	0	3	0	3	0
TAS	0	0	16	0	20	0	2	0	0	0	0	0
VIC	82	0	54	0	116	0	45	0	108	0	57	0
WA	1059	0	2171	5	60	0	282	0	59	0	48	0

Quarterly disease statistics — surveillance activities

SALMONELLA SURVEILLANCE

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

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

Table 8: Salmonella notifications, 1 April to 30 June 2005

Serovars	avian	bovine	canine	equine	feline	ovine	porcine	other	Total
***S.* Bovismorbificans**	0	31	1	0	0	1	2	2	37
***S.* Dublin**	0	36	0	0	0	0	0	0	36
***S.* Infantis**	0	1	7	1	2	0	0	0	11
***S.* Typhimurium**	4	73	6	2	1	5	6	2	99
Other	0	44	19	2	4	1	5	34	109
Total	4	185	33	5	7	7	13	38	292

ZOONOSES

The National Notifiable Diseases Surveillance System (NNDSS) of the Communicable Diseases Network Australia collects statistics about many human diseases. A summary of information about five important zoonoses is submitted to NAHIS each quarter (see Table 9).

Contact: Communicable Diseases Intelligence, Australian Government Department of Health and Ageing (Internet address: www.health.gov.au/pubhlth/cdi/cdihtml.htm)

Table 9: Notifications of zoonotic diseases in humans

Disease	Q2-04	Q3-04	Q4-04	Q1-05	Q2-05	Current quarter						
					AUST	NSW*	NT	QLD	SA	TAS	VIC	WA
Brucellosis#	6	11	17	12	3	0	0	3	0	0	0	0
Leptospirosis	55	29	25	40	33	3	1	26	1	0	0	2
Listeriosis	21	16	14	13	13	6	0	2	0	0	4	1
Ornithosis	58	54	53	37	45	38	0	0	1	0	6	0
Q fever	106	119	118	79	103	35	2	41	11	0	13	1

Brucella melitensis and *Brucella abortus* are exotic to Australia. * ACT and NSW 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 10 summarises the activity of the program over the past five quarters. All specimens tested were negative for TSEs. Information about NTSESP is available on the internet (at www.aahc.com.au/surveillance/ntsesp).

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

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

	Apr – Jun 04		Jul – Sep 04		Oct – Dec 04		Jan – Mar 05		Apr – Jun 05	
	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep
NSW	39	40	50	49	23	30	13	19	25	28
NT	1	0	11	0	4	0	0	0	14	0
QLD	61	2	38	9	29	5	29	0	26	7
SA	10	19	6	11	3	6	3	7	7	20
TAS	4	1	5	1	2	10	4	6	3	0
VIC	12	32	26	37	23	24	14	10	26	33
WA	16	15	12	21	7	77	4	62	7	17
AUS	143	109	148	128	91	152	67	104	108	105

PORTS SURVEILLANCE PROGRAM

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

Contacts: Howe Heng, Biosecurity Australia, DAFF; Leigh Nind, Biosecurity Australia, DAFF

Table 11: Number of inspections of insect trap sites

	Apr – Jun 04	Jul – Sep 04	Oct – Dec 04	Jan – Mar 05	Apr – Jun 05
Port surveillance					
Asian bees	15	18	12	14	21
Varroa and Tropilaelaps mites	25	24	31	23	30
Tracheal mites	28	26	20	22	28
Culicoides	32	30	31	28	29
Screw-worm fly	28	21	23	28	29
NAQS					
Screw-worm fly	36	24	45	45	45

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. Table12 summarises NAQS activity in Australia over the past five quarters.

Contact: Jonathan Lee, Australian Quarantine and Inspection Service, DAFF

Table 12: Summary of recent NAQS activity in Australia

	Apr – Jun 04		Jul – Sep 04		Oct – Dec 04		Jan – Mar 05		Apr – Jun 05	
	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve
Aujeszky's disease	74	0	90	0	157	0	73	0	72	0
Classical swine fever	74	0	90	0	157	0	73	0	72	0
Japanese encephalitis	173	0	97	0	201	5	110	24	37	0
Nipah virus	76	0	90	0	158	0	79	0	0	0
Porcine reproductive and respiratory syndrome	74	0	90	0	158	0	73	0	0	0
Surra	112	0	49	0	69	0	117	0	76	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 in the Northern Peninsula Area on the mainland seroconverted, and JE virus was isolated. This was the first detection of JE on the mainland since 1998. Subsequently, feral pigs from south of Mapoon showed a pattern of serology consistent with exposure to JE virus, but the time of exposure is undetermined. The sentinel pigs in the Northern Peninsula Area did not seroconvert in early 2005 and there has been no evidence of transmission of JE virus on the mainland in 2005. It remains unclear whether JE is established in central Torres Strait islands or is re-introduced from the island of New Guinea in monsoonal weather.

AUSTRALIAN MILK RESIDUE ANALYSIS SURVEY

The Australian Milk Residue Analysis (AMRA) Survey provides a national, independent monitoring system for residues of agricultural and veterinary chemicals, and environmental contaminants in raw cow's milk. The Survey underpins the export requirements of the Australian Quarantine and Inspection Service (AQIS) for dairy products, and facilitates access to major export markets through demonstrating compliance with both European Union and other importing countries' requirements. It is coordinated by Dairy Food Safety Victoria on behalf of the Australian New Zealand Dairy Authorities' Standards Committee, (ADASC), for the Australian dairy industry. The AMRA Survey is risk-based, designed to identify, monitor and manage potential chemical inputs into Australian dairy production that may affect dairy food safety. In doing so, the Survey makes an overall assessment of the effectiveness of the range of controls in place to deliver food safety outcomes with respect to chemicals used in dairy production, as well as focus on particular chemicals that may pose a higher risk of residues being identified in milk. The risk profile of potential contaminants is reviewed annually. Table 13 is a summary of the results for the 2004–2005 year. Over this period 713 milk samples were collected for analysis, from which a total of 1,307 analytical results were reported, for either individual compounds or related groups of compounds. No residues were detected above the Maximum Residue Limits (MRL) specified in the Food Standards Australia New Zealand Food Standards Code in any of these samples.

Table 13: Australian Milk Residue Analysis Survey, 1 July 2004 to 30 June 2005

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

	NSW		NT		QLD		SA		TAS		VIC		WA		AUS	
Aflatoxins	0	5	0	0	0	20	0	0	0	0	0	5	0	0	0	30
Antimicrobials	0	38	0	0	0	21	0	21	0	17	0	191	0	12	0	300
Benzimidazoles	0	4	0	0	0	4	0	0	0	0	0	10	0	0	0	18
Levamisoles	0	4	0	0	0	4	0	0	0	0	0	10	0	0	0	18
Macrocyclic lactones	0	15	0	0	0	18	0	5	0	5	0	16	0	0	0	59
Organochlorines	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	30
Organophosphates	0	46	0	0	0	40	0	22	0	15	0	141	0	12	0	276
Synthetic pyrethroids	0	46	0	0	0	40	0	22	0	15	0	141	0	12	0	276
Triclabendazole	0	38	0	0	0	21	0	21	0	17	0	191	0	12	0	300

NATIONAL RESIDUE SURVEY

Of 2816 samples tested during the quarter for residues of agricultural and veterinary chemicals and environmental contaminants, there was a metal detection in a sheep above the Australian standard. The results are summarised in Table 14.

The metal detection in sheep was of cadmium (1.56 mg/kg compared to an MRL of 1.25 mg/kg). A traceback investigation was not instigated for the detection as it was below the below the residue action level (RAL) of 2.5 mg/kg.

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 14: National Residue Survey, 1 April to 30 June 2005

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	60	0	2	0	75	0	7	0	1	0	27	0	15	0	187
pigs	0	19	0	0	0	11	0	9	0	1	0	13	0	3	0	56
sheep	0	37	0	0	0	4	0	16	0	2	0	26	0	20	0	105
other	0	13	0	0	0	11	0	9	0	0	0	1	0	5	0	39
Total	0	129	0	2	0	101	0	41	0	4	0	67	0	43	0	387
Antimicrobials																
cattle	0	70	0	2	0	97	0	11	0	8	0	46	0	11	0	245
pigs	0	76	0	0	0	45	0	31	0	2	0	53	0	12	0	219
poultry	0	95	0	0	0	34	0	23	0	11	0	40	0	21	0	224
sheep	0	63	0	0	0	3	0	23	0	3	0	38	0	35	0	165
other	0	2	0	1	0	7	0	4	0	0	0	5	0	0	0	19
Total	0	306	0	3	0	186	0	92	0	24	0	182	0	79	0	872
Growth promotants																
cattle	0	61	0	0	0	115	0	5	0	10	0	45	0	9	0	245
pigs	0	33	0	0	0	24	0	21	0	1	0	32	0	5	0	116
poultry	0	6	0	0	0	1	0	1	0	0	0	2	0	2	0	12
sheep	0	44	0	0	0	2	0	12	0	2	0	26	0	22	0	108
other	0	1	0	0	0	1	0	1	0	0	0	2	0	0	0	5
Total	0	145	0	0	0	143	0	40	0	13	0	107	0	38	0	486
Insecticides																
cattle	0	71	0	1	0	146	0	10	0	8	0	46	0	12	0	294
pigs	0	32	0	1	0	12	0	9	0	0	0	14	0	6	0	74
sheep	0	56	0	0	0	4	0	23	0	4	0	34	0	25	0	146
other	0	24	0	0	0	19	0	8	0	0	0	5	0	4	0	60
Total	0	183	0	2	0	181	0	50	0	12	0	99	0	47	0	574
Metals																
cattle	0	22	0	0	0	30	0	2	0	0	0	14	0	3	0	71
pigs	0	21	0	0	0	15	0	9	0	1	0	12	0	2	0	60
sheep	0	12	0	0	0	4	0	9	0	1	0	10	1	8	1	44
other	0	10	0	1	0	13	0	2	0	0	0	3	0	2	0	31
Total	0	65	0	1	0	62	0	22	0	2	0	39	1	15	1	206
Miscellaneous																
cattle	0	39	0	0	0	48	0	6	0	3	0	24	0	10	0	130
pigs	0	38	0	2	0	22	0	20	0	1	0	30	0	6	0	119
sheep	0	15	0	0	0	2	0	5	0	1	0	9	0	8	0	40
other	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	94	0	2	0	72	0	31	0	5	0	63	0	24	0	291

SUSPECT EXOTIC OR EMERGENCY DISEASE INVESTIGATIONS

There were 26 investigations of diseases suspected to be either exotic or a possible emergency reported during the quarter, as shown in Table 15. More details about some of these investigations can be found in State reports.

Table 15: Exotic or emergency disease investigations reported from 1 April to 30 June 2005

DISEASE	SPECIES	STATE	MONTH	RESPONSE	FINDING
Anthrax	bovine	VIC	Apr	2	oak poisoning
Anthrax	bovine	VIC	Jun	1	negative
Anthrax	bovine	VIC	Apr	1	negative
Australian bat lyssavirus	fauna	TAS	Apr	3	rabies fluorescent antibody and PCR negative
Avian influenza	avian	VIC	May	2	mycoplasmosis
Avian influenza	avian	VIC	Apr	2	mycoplasmosis
Avian influenza	avian	QLD	May	3	negative
Avian influenza	avian	TAS	May	3	ELISA negative
Avian influenza	avian	NT	May	3	negative
Bluetongue	ovine	NSW	Jun	2	negative
Bovine malignant catarrh	bovine	TAS	Jun	3	SNT (AIHV1) negative
Hendra virus	equine	VIC	Jun	3	negative
Hendra virus	equine	NSW	Jun	3	negative
Foot-and-mouth disease	bovine	NSW	May	3	erosive glossitis
Newcastle disease	avian	VIC	May	2	infectious laryngotracheitis
Newcastle disease	avian	TAS	May	3	negative
Newcastle disease	avian	TAS	May	3	negative
Newcastle disease	avian	TAS	May	3	negative
Ophidian paramyxovirus	fauna	NSW	Apr	4	negative
PMWS	porcine	NSW	Jun	3	negative
Rabies	feline	TAS	Apr	2	negative on pathology
Sheep pox and goat pox	ovine	SA	Jun	2	positive for dermatophilus and parapox virus
Vesicular stomatitis	equine	NSW	Apr	3	negative
Varroa mite	apian	QLD	Apr	6	*Varroa jacobsoni*
West Nile virus	equine	WA	Apr	3	negative

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

(Continued from page 18)

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).

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
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Jenny **Hutchison**	National NAHIS Coordinator	02 6287 4483	02 6287 4468	jenny@ausvet.com.au
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Disease Watch Hotline — 1800 675 888

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

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

Animal Health Surveillance