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CONTENTS

Preface

Since the last issue of Animal Health Surveillance Quarterly, avian influenza has continued to spread and is now affecting the poultry industries of Turkey, India, Egypt and Nigeria as well as the wild birds of several countries within Europe. Continued spread around the globe is predicted and, therefore, all countries should have systems in place to deal with possible outbreaks. The threat to Australia, although low, is real. It is timely, therefore, that this issue of AHSQ reports on Australia's preparedness to deal with avian influenza. The conduct of Exercise Eleusis in November allowed Australian jurisdictions to examine their capability to deal with such an outbreak. The importance of surveillance as a key component in early detection and effective response against exotic disease incursion cannot be underestimated. Therefore, the Australian Government is providing additional funding to support surveillance programs examining wild birds for avian influenza. These organised surveillance programs also need to be supported by a general public awareness so that any suspicious signs/deaths are reported in a timely way so that immediate response action can be taken.

The October meeting of the OIE Regional Commission also included a discussion of the threat presented by avian influenza and further progressed international cooperation in the fight against avian influenza. A report of the World Organisation for Animal Health (OIE) Regional Commission meeting is included in this edition. Other topics include highlights of disease surveillance activities, items of interest from States and Territories, and summaries of disease monitoring and surveillance programs reported to Australia's National Animal Health Information System (NAHIS). Only summary information is recorded in NAHIS; detailed data are maintained by the source organisations.

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

Gardner Murray, Australian Chief Veterinary Officer

AnimalHealth AUSTRALIA
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Avian influenza preparedness update

This information is current as at 31 December 2005.

Outbreaks of highly pathogenic avian influenza (HPAI) caused by H5N1 viruses continue to be a feature of the international animal health situation. As of January 2006, a total of 17 countries in Asia and Eurasia have reported outbreaks of HPAI (due to H5N1), with Turkey the first country outside of East Asia to report human cases. The multicentric nature of the epidemic and the occurrence of disease in wild birds have raised awareness of the potential role of migratory birds in spreading the disease.

As of 14 January 2006, the cumulative number of human cases reported to the World Health Organization (WHO) was 148, with 79 fatalities. Fortunately, there is no evidence so far of efficient human-to-human transmission. Infection with H5N1 has been reported not only in humans but also in other mammals, including pigs, large cats (e.g. leopards and tigers), and domestic dogs and cats.

In November 2005, the OIE (World Organisation for Animal Health, formerly Office International des Epizooties), the Food and Agricultural Organization of the United Nations (FAO), WHO and the World Bank identified the main steps needed to develop a global action plan for responding to the threat. These steps are:

- controlling the disease at source (e.g. improving veterinary infrastructure in infected and high-risk countries)
- strengthening surveillance and diagnostic systems
- developing rapid containment plans for animal and human cases
- implementing integrated national plans
- ensuring effective communication.

Australia is taking a leadership role in the region in response to the avian influenza threat. The Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) has been providing coordination and technical advice for capacity-building programs in neighbouring countries since the present crisis commenced in 2003. Australia's strategy is to build sustainable and adaptable regional capacity for managing current and future animal health and zoonotic threats. To combat the threat of an influenza pandemic and other emerging infectious diseases in the region, Australia is contributing in four main areas:

- improved surveillance, diagnostic capacity, transparency and coordination (at a domestic, regional and international level)
- a regional simulation exercise, to be held in the first half of 2006
- establishment of a pool of funded regional experts and resources that may be used to respond rapidly to human outbreaks
- establishment of a regional communication system, including a register of disaster coordinators.

Australia is working closely with international organisations to ensure that assistance is well coordinated and efforts are not duplicated. The Australian Animal Health Laboratory (AAHL) at Geelong is playing an important role, acting as an OIE international reference laboratory and providing diagnostic reagents to facilitate laboratory diagnosis in affected countries. AAHL now maintains viral isolates from Vietnam, Cambodia, Malaysia, Indonesia and North Korea; it provides diagnostic reagents to those countries, and to the Philippines, Myanmar, Nepal and Mongolia.

Since migratory birds may play a part in introducing avian influenza, a nationwide surveillance program for avian influenza viruses in wild birds is to be established through the Wildlife Exotic Disease Preparedness Program (WEDPP). The nationwide program will provide data on the seasonal prevalence of avian influenza viruses; it will also monitor the genotypes circulating in wild bird populations, to improve understanding of their natural epidemiology. The program will complement existing wild bird surveillance that the Australian Quarantine and Inspection Service (AQIS) is carrying out in strategic localities across northern Australia as part of its Northern Australia Quarantine Strategy (NAQS) program.

Rapid diagnostic tests could prove useful in the response to incursions of avian influenza into previously free areas. During 2005, DAFF worked in collaboration with Indonesian counterparts to evaluate three rapid diagnostic tests for avian influenza. The field work and laboratory diagnosis were funded by NAQS, and were based at the Disease Investigation Centre (DIC) at Wates, Yogyakarta. This work was followed up with a short training course for animal health officers from Papua New Guinea and East Timor in late 2005, training the officers in the use of the *Antigen AIV Ag* rapid diagnostic test for avian influenza.

In December 2005, the Australian Government announced funding of $495 million over 5 years to prepare for a possible human pandemic.

A national simulation exercise, *Exercise Eleusis'05*, was conducted in late 2005 to test and improve national response and preparedness capacity. Agriculture, health and other supporting agencies in all jurisdictions took part in the exercise with industry. Over 1000 people participated (directly and indirectly) nationally in the exercise and its lead-up activities, and international observers from the OIE, United Kingdom and New Zealand attended. The exercise proved to be a highly successful test of Australia's ability to respond to a simulated multifocal outbreak of highly pathogenic avian influenza. It demonstrated that Australia's response arrangements for significant animal health incidents, including zoonotic disease outbreaks, are essentially robust.

Contributed by: Ian Peebles and Peter Beers, OCVO, DAFF.

Government–industry workshops on BSE and FMD

On 3 and 4 November 2005, representatives from Australia's national, State and Territory governments and from industry met to discuss foot-and-mouth disease (FMD) and bovine spongiform encephalopathy (BSE) at workshops in Sydney. The workshops were co-hosted by the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF), Animal Health Australia and Meat and Livestock Australia (MLA).

The objectives of the workshops were to:

- bring participants up to date on the latest developments in science, international policy and trade concerning BSE and FMD
- update Australia's current risk-management and preparedness plans.

The FMD workshop focused on the areas of animal welfare, feral animals, disposal, vaccination, modelling and surveillance, diagnostic capability, market access and communications. Participants noted that it is essential to maintain the momentum generated by *Exercise Minotaur* in 2002. Significant progress in Australia's FMD preparedness has been made since that time, but continuing work is required to maintain and improve this situation.

Outcomes of the BSE workshop related to the areas of management, communications, diagnostics, the National Livestock Identification System, emergency preparedness, training, trade and human health. Much of the work identified as being required is already under way, and is consistent with the outcomes of the BSE workshop held in December 2004.

Actions arising from the workshops will be incorporated into the Emergency Animal Disease Business Plan that is managed by Animal Health Australia.

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

Meeting of OIE Regional Commission for Asia, the Far East and Oceania

The 24th Conference of the OIE (World Organisation for Animal Health, formerly Office International des Epizooties) Regional Commission for Asia, the Far East and Oceania was held in Seoul, Korea from 15 to 18 November 2005. The meeting was hosted by the Government of the Republic of Korea. The Australian Chief Veterinary Officer, Gardner Murray, is currently president of this Regional Commission.

Emerging diseases were a focus of the meeting, with particular attention being paid to highly pathogenic avian influenza (HPAI), including a report from the Republic of Korea on its HPAI control strategies. The Director General of the OIE, Dr Bernard Vallat, spoke about the importance of veterinary services in providing effective animal disease surveillance to prevent a future global crisis from emerging zoonotic diseases. An epidemiological analysis of bovine spongiform encephalopathy (BSE) was presented to the conference.

The importance of aquaculture in the region was evident, with several agenda items relating to aquatic animal health. These items included an update on activities of the OIE Aquatic Animals Commission, a report from the Network of Aquaculture Centres in Asia–Pacific on its regional approach to aquatic animal health management and a report from the South-East Asia Fisheries Development Centre on its efforts to promote sustainable fisheries development.

Recommendations from the conference will be considered by the International Committee of the OIE at the General Session in May 2006.

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

National Arbovirus Monitoring Program

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

This report covers the second half of 2005, when arboviral activity in northern Australia is usually low. In Queensland, the winter was wetter than usual in many areas, but this was followed by very dry conditions from October through December, except in the southeast, where there were localised storms. The Northern Territory experienced mild and dry conditions during the winter period, and mostly dry conditions from October through December. The exception was the Alice Springs area, where record October rainfall was recorded. The dry conditions in the north were reflected in lower than normal arbovirus activity late in the year. In Western Australia, rainfall was above average in the Pilbara in the first half of the reporting period, but below average for the remainder; however, in the Kimberley, rainfall was average over the period.

Neither seroconversions nor vector activity were detected in the southern states of New South Wales, Victoria, Tasmania and South Australia during the second half of 2005.

BLUETONGUE VIRUSES

In Western Australia, no cattle from sentinel herds seroconverted during this period. Viral activity was very restricted in the Northern Territory, with seroconversions occurring only in northerly sentinel sites. In Queensland, viral activity was limited to sentinel sites on the northeast coast, with two exceptions: in July, one animal seroconverted in a sentinel herd near Chinchilla in the southeast of the state, and, in October, one animal seroconverted in a sentinel herd near Mt Isa in the central west. An investigation is continuing into serological evidence of bluetongue serotype 16, and possibly type 6, detected on the tip of Cape York in far-north Queensland earlier this year. These serotypes have never previously been detected in Queensland.

AKABANE VIRUS

In Western Australia, seropositive cattle were detected in two herds in the Pilbara region, and one in the Kimberley region, but the timing of infection could not be determined. Akabane activity in the Northern Territory was less than in the same period in 2004, and occurred mostly in the northwest of the Territory from July to September. In Queensland, Akabane activity was detected throughout much of the State, although, in many cases, the proportion of animals that seroconverted was low.

BOVINE EPHEMERAL FEVER VIRUS

Seropositive cattle were detected in only one herd during the second half of 2005 in Western Australia, but the timing of infection could not be determined. Bovine ephemeral fever (BEF) viral activity in the Northern Territory was scattered through the northwest and, in Queensland, BEF seropositive cattle were detected throughout the north- and central-west of the State. Central Queensland's Banana Shire was particularly affected.

INSECT TRAPPING

In Western Australia, *Culicoides* activity seemed very low, and *C. brevitarsis* was recorded from only two trapping locations. In contrast, in the Northern Territory, *C. brevitarsis* was widely distributed, but no *C. wadai* were collected, and *C. fulvus* was found in only one site in October.

Additional information can be found at Animal Health Australia's website. [1]

Contributed by: Jenny Hutchison, Animal Health Australia's National Surveillance Coordinator, AusVet Animal Health Services Pty Ltd.

Case definition: post-weaning multisystemic wasting syndrome in pigs

Australia continues to be free of post-weaning multisystemic wasting syndrome (PMWS). Intensive veterinary investigations into a disease event in pigs in South Australia, in which PMWS was initially suspected, were concluded in late 2005, and it was determined that PMWS was not present in the pig herd.

PMWS was first identified in Western Canada in 1991. Although the disease syndrome has since been reported in many European countries, the United States and New Zealand, it has not been diagnosed in Australia. Affected herds generally show wasting and mortality in weaned 4–14-week-old pigs. Signs may include poor growth rate and wasting. Typically, 5–20% of weaners are affected, and up to 80% of these will die.

PMWS is a complex disease of multifactorial aetiology; it requires infection with porcine circovirus type 2 (PCV2) — a virus that has been present in Australian pig herds for at least 10 years. Other infectious, environmental, or genetic cofactors or 'triggers' involved in the expression of this disease are not well defined. Diagnosis relies on a comprehensive case definition, involving:

- expression of typical clinical signs (wasting and weight loss)
- failure to respond to appropriate interventions and treatments
- typical histological lesions, particularly involving lymphoid tissues
- detection of abundant PCV2 associated with the histological lesions.

There is no official international case definition for PMWS, and the OIE (World Organisation for Animal Health, formerly Office International des Epizooties) has not established guidelines on the disease.

The national Consultative Committee on Emergency Animal Diseases (CCEAD), the peak animal health officials' group in Australia at national, State and Territory levels, developed a

1. http://www.animalhealthaustralia.com.au

case definition for the initial diagnosis of PMWS in Australia, comprising three broad elements:

- a herd syndrome involving obvious wasting that is otherwise unexplained and is unresponsive to treatment and management changes
- characteristic histopathology
- PCV2 in lesions, which would usually be demonstrated by immunohistochemistry (IHC) or in-situ hybridisation (ISH).

The case definition was based on the definition developed by Sorden (2000), as adapted by the New Zealand Ministry of Agriculture and Fisheries (Stone 2004). The definition was designed to be rigorous — sufficiently specific to avoid a 'false positive' diagnosis and sufficiently sensitive to avoid giving a false sense of freedom if in fact the disease were present.

Following intensive veterinary investigations, CCEAD concluded that mortalities on the Australian farm had been caused by a variety of endemic diseases, exacerbated by altered management practices and stress. Changed management and routine therapeutic regimes quickly resulted in lowered herd mortality rates. This rapid and profound response to intervention is not characteristic of PMWS in affected countries. CCEAD concluded that the South Australian case met the second and third criteria of the case definition, but not the first criterion.

Veterinary knowledge of Australia's PMWS status depends on the effectiveness of surveillance for PMWS. Veterinarians, especially specialist pig veterinarians, are crucial to effective surveillance. They can help to support Australia's case for freedom from PMWS by reporting suspect cases and submitting samples to laboratories to enable definitive diagnosis of conditions suggestive of PMWS. Veterinarians are urged to ensure that any disease in weaner piglets that raises suspicions of PMWS is investigated, and samples submitted for laboratory analysis if it is not possible to rule out PMWS.

Vigilance by veterinarians will enable veterinary authorities to maintain a strong case for Australia's PMWS-free status, and will help industry to respond quickly should PMWS occur. Veterinarians should always consider the possibility of PMWS as part of the differential diagnosis in the course of investigating wasting disorders in pigs.

Sorden SD (2000). Update on porcine circovirus and post-weaning multisystemic wasting syndrome (PMWS). *Swine Health and Production* 8(3):133–136.

Stone M (2004). Response to the first diagnosis of post-weaning multisystemic wasting syndrome. *Surveillance* 31(4):8–14.

Contributed by: Allen Bryce, OCVO, DAFF.

Ovine Johne's disease research and development update

The latest findings from the national research program for ovine Johne's disease (OJD) were presented at a *Harvest Year* research conference, sponsored by Meat and Livestock Australia (MLA) and Pfizer, in December 2005. The conference was held over two days in Adelaide and included:

- 25 research presentations
- national and industry perspective presentations
- summary presentations of research presented at the recent International Colloquium for Paratuberculosis, held in Copenhagen, Denmark.

The conference was well attended, with about 100 delegates, including interested producers, industry representatives, government animal health staff and researchers.

The research into OJD was managed by MLA as part of the National Ovine Johne's Disease Control and Evaluation Program (NOJDP). This six-year program ran from 1998 to 2004, and aimed to:

- determine the extent of OJD infection in Australia
- evaluate the feasibility and cost effectiveness of eradication of OJD

- develop management and control options to assist affected producers
- minimise the spread of the infection during the evaluation phase.

Most of the projects are now complete and have generated valuable information to help the sheep industry to control this disease.

Major areas of research within the NOJDP included:

- controlling OJD within infected flocks
- determining the economic impact of OJD
- eradicating OJD from infected farms
- investigating cross-species transfer of OJD
- detecting OJD
- conducting basic research to identify new ways to detect and control OJD
- preserving genetic material from infected flocks.

Major outcomes from the program include:

- evaluation and registration of an OJD vaccine
- development of improved diagnostic tests for the disease
- development of scientifically based pasture and animal-management strategies to limit the impact of infection in affected flocks
- assessment of the feasibility of OJD eradication from flocks
- assessment of the economic cost of the disease to individual producers
- improved understanding of the role of other animal species in the spread of the disease.

The NOJDP and associated research program have now officially ended, although a number of projects are continuing over the next few years. Future OJD research will now be managed by MLA and Australian Wool Innovation (AWI); thus, new OJD research proposals will be evaluated against competing priorities in animal health research and development.

Topics for continuing OJD research projects include:

- long-term evaluation of vaccination for control of OJD in infected flocks
- investigation of the basic pathogenesis of OJD, with a view to developing new technologies for diagnostic tests and vaccination
- further improvement of the direct polymerase chain reaction (PCR) test on faeces
- development of pooled faecal culture in goats.

The *Harvest Year* conference provided an opportunity to showcase the research findings, and to update government and industry stakeholders on the latest developments. As such, the conference was a marked success and provided a fitting close to a major research program.

Copies of the conference proceedings and other information arising from MLA's OJD research program are available from the MLA website.[2]

Contributed by: Evan Sergeant, MLA External Coordinator — Johne's Disease, AusVet Animal Health Services Pty Ltd.

Australian Wildlife Health Network

The Australian Wildlife Health Network (AWHN) receives reports of wildlife incidents and definitive diagnoses of cause of death in wildlife in Australia. All contributions are recorded in the AHWN database (the Wildlife Health Information System, WHIS[3]). This report provides summaries of selected incidents.

The network is interested in receiving reports of wildlife incidents, and definitive diagnoses of causes of death in wildlife in Australia. For copies of the network newsletter or digests, contact Amy Jones at awhn@zoo.nsw.gov.au.

2. http://www.mla.com.au/TopicHierarchy/InformationCentre/AnimalHealthandWelfare/Animalhealth/Diseases/Ovine+Johnes+Disease.htm

3. http://www.wildlifehealth.org.au

The most important activity of AWHN in the last quarter has been the finalisation of a national surveillance program for influenza viruses in wild birds, which is now operating in four Australian States. The program aims to:

- provide data on seasonal prevalence of avian influenza viruses in wild birds in Australia
- monitor the genotypes of avian influenza viruses circulating in Australian wild birds and better describe their natural epidemiology.

The main priority is to sample ducks within 3–4 weeks of hatching, but adult ducks and waders will also be sampled.

At the direction of the Animal Health Committee, the Australian Registry of Wildlife Health has prepared a sample collection protocol for health surveillance of sick and dead birds.[4] The protocol will help a diagnosis to be reached in sick and dead birds collected in Australia, and will allow testing to rule out the presence of animal diseases of concern to Australia (e.g. avian influenza, West Nile virus and Newcastle disease). A national steering group has been formed, and results from the Northern Australian Quarantine Strategy (NAQS) and bird surveillance programs will be integrated with the national program. A zoos group has also been formed, to complement the State activities, especially in collecting appropriate samples over an extended period.

Numerous wildlife events have been reported for the last quarter; those included here are cases that may be significant for human or animal health, biodiversity, trade or Australia's agroeconomy. Further information can be found on the AHWN website or through the WHIS online database.

MASS OR UNEXPECTED MORTALITIES/ MORBIDITIES OF UNKNOWN CAUSES

In Centennial Park, New South Wales, a number of birds, including Australian pelicans (*Pelecanus conspicillatus*), were found dead over two weeks in a pond. The birds were negative for avian influenza and for C and D botulinum. Enterotoxaemia is suspected, and *Escherichia coli* was the only organism found in all the birds that is capable of producing enterotoxins. Further testing is underway to determine whether the *E. coli* isolated from the birds is capable of producing enterotoxins.

SUSPECTED EXOTIC AND OIE LIST DISEASES

Avian influenza and Newcastle disease were ruled out as the cause of death in two mass-mortality events in wild birds during the quarter. Four wild sacred ibis (*Threskiornis molucca*) were found with paralysis over a few days at Marrickville in New South Wales. Two of the birds had evidence of traumatic injuries sufficient to account for paralysis. In addition, a number of captive ducks and geese (Anatidae) of mixed species died suddenly in New South Wales. The birds had no evidence of any lesions on gross and microscopic examination, which suggested the cause was exposure to a toxin, or a peracute viral infection.

OTHER

Grey-headed flying fox (*Pteropus poliocephalus*)

High temperatures in late December 2005 and early January 2006 were the likely cause of death in large numbers of grey-headed flying foxes in New South Wales, Queensland and Victoria. Most of the dead animals were neonates. Given the potential impact of global warming on the population status of this threatened species, a questionnaire is being prepared by the Australian Registry of Wildlife Health to send to wildlife rehabilitators, to obtain additional information on this and any future events.

Contributed by: Chris Bunn, OCVO, DAFF, and Rupert Woods, Coordinator, AWHN. The network would like to thank all those who submitted information for this report.

4. http://www.arwh.org

Aquatic Animal Health

AQUATIC ANIMAL HEALTH COMMITTEE TELECONFERENCE

The Aquatic Animal Health Committee (AAHC) held its 8th meeting, a teleconference, on 15 November 2005. The committee discussed its main activities; these included the following:

- The role that AAHC has played in the development of BIOSEC (The *Australian Biosecurity System — Primary Production and the Environment Component*), which is to be a major part of the National Biosecurity Strategy. AAHC will continue to contribute to BIOSEC by providing advice on the main aquatic animal health issues to the joint natural resource management/primary industries steering group.
- Provision of advice to the National Animal Health Surveillance Strategy (NAHSS) secretariat, to ensure that aquatic animal health surveillance priorities are addressed appropriately and in a manner consistent with the objectives of AQUAPLAN 2005–2010. NAHSS provides a framework for considering Australia's animal health surveillance requirements.
- AAHC's involvement in the development of an action plan for the aquatic animals sector of the Australian Animal Welfare Strategy.

AQUAPLAN 2005–2010 IMPLEMENTATION

AQUAPLAN 2005–2010 outlines a strategic approach to management of aquatic animal health over the next five years. Since the plan was launched in July 2005, considerable progress has been made on several of its objectives, and AAHC will soon begin the process of monitoring and review. This process will begin with the first AQUAPLAN Stakeholder Workshop, which is being held in Melbourne on 4 and 5 April 2006. The workshops will be an annual event and will give participants the opportunity to help steer progress and prioritise projects over AQUAPLAN's 5-year term.

Further information on AQUAPLAN 2005–2010 and the stakeholder workshop can be found on the DAFF website.[5]

DISEASES IN ASIAN AQUACULTURE SYMPOSIUM

In October 2005, representatives from the Office of the Chief Veterinary Officer (OCVO) and Biosecurity Australia attended the *Sixth Symposium on Diseases in Asian Aquaculture* in Colombo, Sri Lanka, organised by the Fish Health Section of the Asian Fisheries Society. The symposium's theme of 'Aquatic Animal Health: Facing New Challenges' covered a wide range of topics, including technological advances in aquatic animal health, biosecurity and risk assessments, and regional and international cooperation.

The main issues discussed included:

- emergency preparedness and use of contingency plans
- the importance of international and regional cooperation and networking (from farm level through to international industry groups)
- the role of veterinarians and non-veterinarians in aquatic animal health management.

There was also extensive discussion on the emergence and spread of koi herpes virus (KHV). Although KHV is exotic to Australia, it is present in a number of countries within the Asia–Pacific region, including Indonesia, Thailand and Japan (and in Europe and the United States). The discussion topics ranged from identification of virus isolates and diagnostic techniques to possible vaccination methods.

Contributed by: Sean Savage, OCVO, DAFF.

5. http://www.daff.gov.au/aquaticanimalhealth

State and Territory reports

New South Wales

Contributed by:
Barbara Moloney
NSW DPI

ANTHRAX

There were five confirmed anthrax incidents during the quarter. The first incident involved 8 deaths in a herd of 420 beef cattle on a Northern Slopes property during September and October. Although the property is not located in the usual endemic area for anthrax, the disease was reported nearby in 1973, in the Gwydir River area around Moree.

The next three incidents (within the usual endemic area for anthrax) were in a cluster of properties near the border of the Murray and Riverina districts, where deaths occurred in early December. The properties were separate, but located within a 7-km radius. Confirmations of anthrax on the three properties were made within one week. Two cattle and two sheep died on one property, out of a population of 442 beef cattle and 1650 sheep; five sheep died out of 2000 on the next; and a single animal died in a herd of 700 beef cattle on the last property in the cluster.

The fifth incident involved 40 deaths out of 700 ewes and lambs on a Condobolin district property in late December.

All incidents were managed as per the anthrax policy of the New South Wales Department of Primary Industries. Properties were quarantined, carcases were burnt on site, and all at-risk stock were vaccinated. Tracing of cattle movements from one of the affected properties found that stock had moved to five separate destinations in the few days previous to the diagnosis being made; no at-risk movements were detected. The National Livestock Identification System (NLIS) database for cattle proved very useful in identifying the stock movements.

Seven investigations of mortalities in Condobolin and Molong districts excluded anthrax as the cause of death. Three incidents involved cattle, where diagnoses included hepatopathy and ruminal lactic acidosis. Definitive diagnoses were not made for the four sheep incidents.

STRANGLES

One strangles outbreak was reported during the quarter, with six horses affected and treated. Other horses on the property were vaccinated and immediately isolated from the affected animals.

AVIAN INFLUENZA EXCLUSION

On 21 December 2005, the Acting Chief Veterinary Officer (CVO) from Victoria notified that there was a weak positive reaction to laboratory testing for the universal H (avian influenza) antigen from sick birds from a backyard flock in Wentworth in southwestern New South Wales. Two parrots and one budgerigar had died over the last six months. A number of chickens had also died over the last two months. There were two ducks on the farm.

Initial testing at the Australian Animal Health Laboratory (AAHL) at Geelong on 22 December did not conclusively rule out the presence of the avian influenza H5 antigen. As a precaution, the property was placed in quarantine and more samples were collected and sent to AAHL. On 24 December, AAHL advised that all serological and polymerase chain reaction (PCR) tests were negative, and that the initial result was a false positive. The property was then released from quarantine and further investigations confirmed that the poultry died of Marek's disease.

FOOT-AND-MOUTH DISEASE EXCLUSION

A private practitioner attended three Hereford heifers with mouth ulcers and fever near Wagga Wagga. The heifers had been purchased three months previously from a property where heliotrope was present, and were now grazing lush pasture. Although photosensitisation was the most likely diagnosis, the presence of oral lesions resembling foot-and-mouth disease (FMD) lesions could not be disregarded. The District Veterinarian from Wagga Wagga was called onto the property to exclude FMD. Samples sent to AAHL were negative for FMD.

EQUINE HERPESVIRUS ABORTION

Four cases of equine herpesvirus type 1 (EHV1) abortion were reported in New South Wales during the quarter. Cases were located in the districts of Hunter (one in thoroughbreds and one in miniature ponies), Central Tablelands (stockhorse) and Nyngan (thoroughbred). The two cases outside the Hunter district had tracings to known infected properties, one in New South Wales and the other interstate. All cases were confirmed EHV1 by laboratory examination of foetuses.

ENZOOTIC BOVINE LEUCOSIS IN A BEEF HERD

Enzootic bovine leucosis (EBL) infection was serologically confirmed in a 7-year-old Friesian cow that was part of a northern New England herd of 85 beef and dairy or house cows. The animal was noted to have been unwell following recent weaning of two calves, and was attended by a local practitioner, who noted loss of body condition and enlarged lymph nodes. The cow was humanely destroyed. Further investigation of the herd found two more animals serologically positive to EBL. One of these has since died, and the other has been separated from the herd to be sold only for slaughter as soon as its calf has weaned. Progeny of affected animals have so far tested negative. The original animals in the herd had been purchased as poddy (hand or artificially reared) calves from various sources, including a disbanded dairy.

CRYPTOSPORIDIUM IN CALVES

Cryptosporidium has been unusually prevalent amongst the many causes of calf scours this season. There has been a marked increase in faecal sample submissions to laboratories, compared with previous years.

The New South Wales Health Department has also reported a sharp rise in the number of humans infected with cryptosporidium in the last couple of months throughout the state, with the Hunter New England area as one of the focal regions. This was of sufficient concern that a survey was arranged to investigate possible sources of infection. Early results suggest that, in about 25% of cases, contact with cattle is implicated as a likely cause.

Sheep, pigs and especially kangaroos can also shed cryptosporidium, without showing signs of diarrhoea. Overflow of septic tanks can add to contamination of the environment. It is thought that heavy rains then wash the oocysts of cryptosporidium into dams that are a source of drinking water for humans.

Different strains of cryptosporidium tend to be found in different species, but cross infection can occur. The New South Wales Health Department is liaising with New South Wales Department of Primary Industries Regional Veterinary Laboratories to obtain samples of cryptosporidium for typing, to further elucidate the major culprits in human infections.

Northern Territory

Contributed by:
Francois Human
DPIFM

HENDRA VIRUS EXCLUSION IN A HORSE

A horse from a rural block in Katherine showed sudden onset of respiratory disease signs. Clinically, it was dehydrated and appeared depressed, with intermittent bouts of discomfort. Occasionally, it would develop raspy breathing and cough a few times; when the head was dropped a straw-coloured fluid ran from the nostrils and mouth. Samples were taken to exclude Hendra virus while the horse was treated for pneumonia. All tests for Hendra virus were negative and a definitive diagnosis was not reached, but the horse made an uneventful recovery.

BOTULISM IN WILD BIRDS AND POULTRY

Botulism is an ongoing disease in the wild-bird population and backyard domestic poultry of the Northern Territory top end, with seasonal fluctuations. In the Darwin rural area, three separate incidents of botulism in poultry were diagnosed. In one case, the chickens ate maggots from a dead goanna. Maggots and the associated decaying carcases seem to be the most important source of infection.

In the Katherine region, whistling ducks have continued to die on a sewage pond for a 3-month period. *Clostridium botulinum* type C was confirmed in one sick bird. Dead ducks were removed from the ponds in an attempt to break the perpetuating cycle and the deaths have now ceased.

OPHIDIAN PARAMYXOVIRUS IN A CARPET SNAKE

A moribund carpet python was submitted for autopsy. The snake was unable to right itself and showed persistent inappropriate gaping. Subsequently, two more pythons from the same facility developed the same signs, and were also submitted for post mortem examination. All of these snakes were captive bred and were kept in captivity in a registered facility all of their lives. On histological examination, there was a marked spongiosis in the white matter of the brain. This lesion of severe leukoencephalopathy that also involved the brainstem is suspicious of ophidian paramyxovirus (OPMV), although histology cannot provide a definitive diagnosis for this disease. A differential diagnosis would be chronic organophosphate poisoning, but no convincing history of possible exposure could be established.

Queensland

Contributed by:
John Cronin
QDPI&F

EPHEMERAL FEVER

During October 2005, bovine ephemeral fever (BEF) virus was identified by polymerase chain reaction (PCR) from five animals on four properties in central Queensland. A 3-year-old recently calved heifer on a property in Banana Shire, which was recumbent but recovered, was PCR positive. A second animal — a 5-year-old cow from Banana Shire showing signs of fever and recumbency — was also PCR positive, but did not respond to treatment. Post mortem examination of this cow revealed turbid joint fluid, but no other gross or histological signs. No other cows were affected in the group of 43 heavy cull cows. A third property, also in Banana Shire, had two PCR-positive bulls from a group of six that had been recently introduced to the property; signs included salivation and recumbency. The fourth property, in Belyando Shire, had one animal PCR positive for BEF virus. A number of cattle in other groups on this property also showed signs consistent with BEF.

In November 2005, BEF virus was detected by PCR on seven Darling Downs properties, with affected animals in the 1 to 5-year age group. Signs seen were lethargy, fever, and ataxia plus recumbency. BEF was diagnosed using PCR on a further eight properties in southeast Queensland.

BLACKLEG

A Rosalie Shire beef property in south Queensland had 10 deaths over several days in a group of 65 heifers aged 12 months. Affected animals had temperatures of 39.5–40°C, respiratory distress and infected mucous membranes. *Clostridium chauvoei* was isolated from liver, lung, pericardium and skeletal muscle. Deaths occurred despite the cattle being vaccinated by the owner at three months of age. Livestock producers are advised to exercise care with issues relating to ordering, storage and administration of vaccines such as the multivalent clostridial vaccines used to prevent blackleg. Booster vaccinations are also required to confer long-lasting protective immunity on susceptible animals. Notes from the Department of Primary Industries and Fisheries cover the topics of 'Livestock vaccination' and 'Vaccines – ordering and storage'. [6]

BRUCELLA SUIS IN A BEEF COW

Bovine brucellosis due to infection with *Brucella abortus* has been eradicated from Australia since 1989. However, swine brucellosis occurs in feral pigs in areas of central Queensland and cattle may occasionally be exposed to infection, causing an antibody response that requires differentiation from bovine brucellosis. An investigation was conducted on a Longreach Shire property in western Queensland into infertility on a Santa Gertrudis stud farm which had a calving rate of about 66%. A blood sample from one cow was serologically positive for brucellosis. This cow and four others with similar histories of abortion and a low calving rate were resampled and examined for pregnancy. The cow in question was 3.5 months pregnant, and again tested positive for brucellosis. All others in the herd tested negative for brucellosis.

The cow was destroyed and a post mortem carried out. No gross pathology was seen, and fresh and formalin-fixed tissues were sent, with the foetus, for further examination and culture to determine

6. Available at http://www.dpi.qld.gov.au

the species of brucella. *Brucella suis* was isolated from an ante mortem milk sample. No bovine brucellosis *(B. abortus*) was detected on culture of tissues.

HAEMOPHILUS SOMNUS INFECTION IN A STEER

A 20-month-old Brahman steer out of a group of 300 at-risk animals was found dead in its pen on a Darling Downs feedlot. The steer had extensive oedema of the dewlap, brisket and ventral abdomen. There was consolidation of the ventral wall of the right lung, with extensive pleural adhesions. The pericardial sac contained yellow fluid and a large amount of fibrin was present over the epicardium. On histological examination, a severe, chronic, fibropurulent pleuropneumonia and pericarditis were present. *Haemophilus somnus* was isolated from a pericardial swab.

NITRATE POISONING

A Warwick Shire beef property in south Queensland bought yearling beef cattle from a saleyard, and put them onto kikuyu and couch grass. There were two deaths overnight and four sick animals by the next day. One sick animal was comatose and three were dull and depressed, with brownish blood and blue-brown mucous membranes. The nitrite level in the aqueous humour of a dead animal was 59 mg/L.

Nitrate poisoning also caused the deaths of two beef cattle out of 30 head in Esk Shire in mid-December. The yearlings were fed pasture hay that contained 5.2–7.1% potassium nitrate on a dry-matter basis.

YELLOW-WOOD POISONING

On a property in Broadsound Shire in central Queensland, 70 out of 200 12-month-old cattle died suddenly, and a further 20 were sick. Other groups of cattle on the property were unaffected. Clinical signs noted before recumbency and death included ill-thrift, weakness, depression and jaundice. The cattle had recently been placed in a paddock containing abundant dry buffel grass of poor nutritional value. Amongst the buffel grass were scattered metre-high bushes identified as *Terminalia oblongata*, commonly called yellow-wood. The plant normally grows into a tree, but in this case the paddock had been cleared and the trees were only small suckers. They were devoid of leaves and had obviously been eaten by the cattle. Clinical and post mortem findings were consistent with tannin poisoning, with the primary lesions being severe nephrosis and hepatitis due to accumulation of tannins in the kidneys and liver. There was accompanying enteritis, with secondary uraemic ulceration of mucous membranes in the oral cavity and upper intestinal tract. Yellow-wood poisoning is relatively rare, considering that the plant is quite common in parts of central Queensland. Typically, outbreaks occur where young stock, unfamiliar with the plant, are placed in a paddock containing the plant and either little other feed or feed low in protein, resulting in cattle eating the leaves of the plant.

BABESIOSIS

Sickness and death due to *Babesia bovis* infection was diagnosed on two properties in the Banana Shire, within the cattle tick endemic areas of central Queensland, during the quarter. One property lost 13 head out of 130 mixed-age female cattle; signs observed in sick animals included fever, reduced exercise tolerance and pale mucous membranes. *Babesia bovis* was diagnosed on organ smears collected at post mortem examination. The second property lost 3 of its 80 2-year-old heifers, with a further 5 heifers sick. Signs observed included fever, salivation, cough, anaemia, jaundice, ataxia, other nervous signs and sudden death. Smears collected at post mortem examination revealed *Babesia bovis* as the cause of the deaths in two animals sampled at separate stages of the outbreak.

Six further cases of *Babesia bovis* infection were diagnosed at outbreaks on properties in the cattle tick endemic areas of southeast Queensland.

CEREBRAL ECHINOCOCCOSIS (DIAGNOSED IN A CASE FOR TSE EXCLUSION)

A 10-year-old Angus cow on a Crows Nest Shire property had shown nervous signs and been losing condition for 4 months. Nervous symptoms had gradually developed and progressed to the stage where the cow was blind and could only walk in circles. On post mortem, the only remarkable gross findings were large numbers of hydatid cysts in the lungs and liver. Dissection of the brain submitted for transmissible spongiform encephalopathy (TSE) exclusion revealed a large fluid filled cyst within the left cerebral hemisphere that was

compressing adjacent tissue. Histological examination revealed the presence of a hydatid cyst.

HAEMONCHOSIS IN SHEEP

There were 40 deaths out of 360 merino-cross sheep aged 12 months on a Warwick Shire property. Sheep had pale mucous membranes. On mustering, some sheep exhibited staggering and trembling, followed by recumbency and death. Worm egg counts up to 13 100 eggs per gram were recorded, with *Haemonchus* sp. found in the stomach of autopsied sheep. Laboratory testing showed severe anaemia, and associated anoxic changes were seen in liver cells.

ENTEROTOXIC COLIBACILLOSIS IN PIGS

Haemolytic *Escherichia coli* was isolated from the small and large intestine of grower pigs of mixed age showing dehydration and scouring at a large Darling Downs piggery. The small and large intestines of autopsied pigs were flaccid and dilated by excessively watery contents, and showed injection of mesenteric vessels. There were 98 deaths out of 1100 head at risk.

PSEUDOMONAS INFECTION IN CHICKENS

An increased mortality rate in 3-day-old broilers resulted in 392 deaths out of 9080 at risk on a Murgon Shire farm in southeast Queensland in early December 2005. *Pseudomonas aeruginosa* was isolated from the yolk sac, large intestines, liver, caecum and heart of autopsied chickens, and caused the omphalitis and pericarditis seen on histopathology.

ORGANOPHOSPHATE POISONING DIAGNOSED IN AN AVIAN INFLUENZA EXCLUSION (WILD BIRDS)

A young galah in Blackall Shire was found in very poor condition. It was lethargic, unable to fly and had soiling around the vent. Apart from slight pasting of the vent and congestion of the carcase, nothing significant was found at post mortem examination. Histological examination was unrewarding. Tracheal and cloacal swabs were sent to AAHL for avian influenza (AI) exclusion, and intestinal contents were sent for pesticide analysis. AI was ruled out, but intestinal contents revealed 200 mg/kg chlorfenvinphos and 45 mg/kg cypermethrin in the intestinal contents, leading to a diagnosis of organophosphate poisoning.

South Australia

Contributed by:
Celia Dickason
PIRSA

SUDDEN DEATHS IN CATTLE — ANTHRAX RULED OUT

In a herd of 40 mixed-age cattle on the Yorke Peninsula, 10 animals were found dead. The cattle had been healthy when visited three days previously. Dead cattle were found bloated and in lateral recumbency, with marks indicating they had struggled terminally. Frank blood was seen at the nostrils and anuses of several cattle. The attending veterinarian was concerned that anthrax was a potential diagnosis, although this disease is exotic to South Australia. Anthrax was excluded following examination of peripheral blood smears from three cattle. Ten more cattle died overnight, and several cattle were observed with hypermetria, ataxia and seizures. Annual ryegrass comprised a small portion of the pasture, and was found to be heavily infected with *Rathayibacter toxicus*, the cause of annual ryegrass toxicity (ARGT). ARGT was diagnosed on clinical signs and pasture infection, following the exclusion on histopathology and biochemistry of nitrate and salt toxicity, and malicious poisoning. A total of 27 cattle died. It is thought that the blood noted at orifices was due to rapid decomposition in unseasonably hot, humid weather. Several cases of ARGT have been reported in South Australia this year.

MARSHMALLOW TOXICITY IN YOUNG SHEEP

A producer in the mid-north reported that 25 of his young merino sheep (hoggets) had died over a period of 3 weeks. The remaining 275 were affected with staggering and altered gait, were unable to walk long distances and were exhibiting head tremor. The hoggets were kept in a paddock that contained large quantities of flowering marshmallow (*Malva parviflora*), as well as annual ryegrass, barley grass and small quantities of salvation jane (*Echium plantagineum*). No gross signs were seen in an affected animal sacrificed for post mortem examination, and histopathology showed no lesions in the organ tissues, brain or multiple sections of spinal cord. Marshmallow poisoning was the presumptive diagnosis, and

affected sheep have improved since being removed from the paddock. Some sources suggest that marshmallow poisoning is a nitrate/nitrite toxicity, but high nitrate levels were not found in affected animals in this case.

VERMINOSIS AND/OR COCCIDIOSIS IN SHEEP

A high proportion of sheep samples submitted to the laboratory to investigate ill-thrift or diarrhoea were found, after faecal egg counts or histopathological examination, to have enteric nematodal verminosis or coccidiosis. Histologically, sections of nematodal worms were seen in the lumen of the duodenum, jejunum or ileum, and to a lesser extent in the caecum and (in some cases) also in the abomasum. A lamb from the Riverland region had both a significant enteric worm burden and a severe verminous pneumonia. Large numbers of larvae were seen on histological examination of the lung of this lamb, suggesting a probable *Dictyocaulus* sp. pneumonia. Faecal egg counts in these cases revealed moderate to high worm burdens. Coccidial oocyst numbers ranged from low to high, but did not always correlate with the level of coccidial infestation seen histologically, as was the case with two lambs from the Murray Bridge region. These lambs had a moderate worm burden, and small numbers of coccidia were seen on faecal flotation examination. Histology, however, revealed high numbers of coccidia, with the majority being in the early asexual stages of development. Culture of the intestinal content in these two lambs also indicated an enteric salmonellosis.

TREMOR AND NERVOUS SIGNS IN A LITTER OF PIGLETS

In September, a litter of pre-weaning piglets from the Minlaton region developed shaking and tremors, even while asleep, and weakness progressing to paralysis. Some piglets also developed diarrhoea. There was no improvement with antibiotic therapy and two piglets (a male and female) were submitted for necropsy. Blood for haematology and biochemical analysis from the female piglet revealed evidence of moderate muscle damage, attributable to the central nervous system signs. There was also a moderate neutrophilic leucocytosis (suggesting inflammation or infection) and a mild anaemia, probably due to chronic inflammation or infection. Gross necropsy of both piglets was unremarkable. Isolation of a *Streptococcus Group B* strain from a swab of a pneumonic lobule indicated the tremors were due to a streptococcal septicaemia with meningo-encephalitis and myelitis.

FISTULOUS WITHERS RULED OUT

A thoroughbred racing stable near Murray Bridge presented a horse with a draining sinus tract affecting the supraspinous bursa. The condition was unresponsive to penicillin. Fistulous withers (caused by infection with *Brucella abortus* which is not present in Australia) was excluded based on negative serology for *B. abortus* and the culture of *Enterococcus faecalis* (with multiple antibiotic resistance) from the tract. It was assumed that a wound had become infected with this organism, which is an intestinal organism frequently found as an environmental contaminant.

ASPERGILLUS IN TURKEY POULTS

Poults being brooded on a free range turkey enterprise near Murray Bridge began to die at around 12 days of age. At necropsy, multiple keratin ‘pearls’ were seen in the abdomen and lungs. Investigation into the housing revealed that the owner had used mouldy hay from his haystack as litter in the brooding area, as it was not considered suitable to feed. An *Aspergillus* species was cultured from lungs.

Tasmania

Contributed by:
Mary Lou Conway
DPIWE, Tasmania

LABORATORY ACCESSIONS

Source	Number of accessions
Aquaculture	72
Companion	95
Livestock	421
Other	9
Wildlife	92

NOTIFIABLE DISEASES

	Investigations	
Disease	**Positive**	**Total**
American foul brood	0	1
Anthrax	0	1
Avian influenza	0	4
Avian psittacosis	2	6
Brucella abortus	0	6
Brucella ovis	0	18
Clinical salmonellosis	35	70
Contagious agalactia	0	1
Enzootic bovine leucosis	0	2
Hydatid disease	4	6
Johne's disease	1	10
Leptospira hardjo	1	19
Leptospira pomona	1	18
Listeria	0	17
Macrocyclic lactone resistance	0	2
Marine aeromonad disease	1	2
Negative finfish bacteriology*	0	40
Q fever	0	6
Pullorum disease (*Salmonella* Pullorum)	0	11
Salmonella Abortusequi	0	1
Salmonella Abortusovis	0	9
Salmonella Enteritidis	0	16
Transmissible spongiform encephalopathy	0	13
Verotoxic *Escherichia coli*	0	1
Viral encephalopathy and retinopathy	0	2

* *Aeromonas salmonicida* ssp *salmonicida*, goldfish ulcer disease, streptococcosis of salmonids

SUDDEN DEATH IN DAIRY CATTLE

Sudden death of two cows on the same day in a mob of 180 head on a property in the northwest of Tasmania was investigated as a suspect anthrax case. Both cows were found dead and had bloody discharges from all orifices. Anthrax was excluded on microbiological examination. The paddock the cows were in had been fertilised with nitrogen 12–13 days before the deaths, leading to a diagnosis of nitrate or nitrite toxicity.

SEPTICAEMIC SALMONELLOSIS IN CALVES

Fourteen calves of a total group of 330 head on property in the central north died over a 2–3-week period. The affected group were shed-reared and 2–3 months of age. The disease course was 2–4 days, with no response to routine antibiotic therapy. Pathology consistent with clinical salmonellosis was found, with multiple organ necrosis. *Salmonella* Dublin was subsequently identified from cultures.

SUPPURATIVE MENINGOENCEPHALITIS IN LAMBS

Eight of 300 7–10-week-old lambs died on a Southern Midlands property in November. Only one paddock was affected. Clinical examination noted nystagmus and severe hind-quarter weakness. The lambs were in good body condition and there was no other abnormality such as diarrhoea. No gross abnormalities were observed on autopsy; however, there were multiple micro-abscesses, marked perivascular cuffing and gram-positive bacilli resembling *Escherichia coli* in the cerebrum on histopathology. Perivascular cuffing was also found in the cerebellum. A non-motile strain of *E. coli* was cultured from the liver. The clinical signs and laboratory results were consistent with the septicaemic *E. coli* strain 078, which is a non-motile strain associated with septicaemia, septic arthritis and meningoencephalitis in young lambs generally under 16 weeks of age.

SUSPECT POST-WEANING MULTISYSTEMIC WASTING SYNDROME RULED OUT

Morbidity and mortality in a herd of pigs in the north of the State has been under extensive investigation for porcine multisystemic wasting syndrome (PMWS) for several months. The herd, housed intensively, is primarily a grower operation, with overlapping batches of weaner pigs introduced from numerous sources (including the mainland) and grown out to 55 kg or baconers on contract. Previous disease history was unremarkable, especially considering constant population turnover.

Mortality appeared to increase with a batch of 61 weaners introduced in August, with ill-thrift, weakness, diarrhoea and death. Ten of this batch died over 2 months, with herd mortality trebling overall during a 4-month period. Consequently, introductions were halted and the herd size was dramatically reduced from 600–700 down to 300 head from July to September.

The losses have ceased. This particular case did not meet the case definition for PMWS.

AVIAN DISEASE INVESTIGATIONS

Over the last quarter of 2005, several avian mortality cases were investigated. These included hepatic necrosis in ducks (avian influenza [AI] and duck viral hepatitis were excluded), runting-stunting syndrome in chickens, *Mycoplasma gallinarum* infection (AI and Newcastle disease virus ruled out) in layers, respiratory disease in farmed partridge (AI ruled out), bacterial hepatitis in wild blackbirds (*Turdus merula*) (AI and West Nile virus ruled out).

Victoria

Contributed by:
Tristan Jubb
DPI, Victoria

SALMONELLA DUBLIN IN CALVES

Incoordination, high temperatures, coughing and bloody scours developed in 7 out of 70 Friesian–Angus-cross calves on a property near Colac in southwest Victoria, in November, approximately two months after their purchase from saleyards. Calves were in good body condition but there was access to rubbish in the yards, including a rusting drum of an unknown liquid. Treatment included antibiotics, fluids and electrolytes, but two calves died.

An autopsy was conducted on a 4-month-old calf that had been sick for 10 days and had lost significant condition before death. The differential diagnoses included salmonellosis, bovine virus diarrhoea, arsenic poisoning, lead poisoning and plant toxicity. *Salmonella* Dublin was cultured from liver, lung, spleen and intestine.

YERSINIOSIS IN WEANED DAIRY HEIFERS

In December, yersiniosis is suspected to have killed one calf and affected 20 others on a property near Maffra in Gippsland. These animals were part of a mob of 128 3–5-month-old dairy heifers. The heifers were grazing a permanent calf paddock of irrigated pasture, supplemented with 1.5 kg calf pellets and crushed wheat every second day. They had been drenched with a benzimidazole drench three weeks before appearance of clinical signs that included fluid diarrhoea, dehydration and weight loss. The differential diagnoses included yersiniosis, and parasitism following the use of an ineffective worm drench.

Faecal samples collected from the pasture returned moderate to high faecal egg counts (up to 300 eggs per gram). Heifers were yarded and drenched the following day with a macrocyclic lactone drench, and further faecal samples were collected from the rectum of eight affected calves for culture and faecal egg count. Six of these calves had zero faecal egg counts and two had 30 eggs per gram. This suggested that parasitism was not the primary cause of the problem and that worm eggs from the pasture may have contaminated the samples collected from the pasture. Faecal culture was positive for *Yersinia* sp. in five of the eight samples submitted.

MULTICENTRIC MAST CELL TUMOUR IN A COW

In November on a farm near Warragul in Gippsland, a mature beef cow was diagnosed with the rare skin condition, multicentric mast cell tumour. The animal had hundreds of intracutaneous lumps varying in size from a few millimetres to about 10 cm diameter, which had apparently developed over two months.

Mast cell tumour was diagnosed; such tumours are infrequent and are invariably malignant in cattle. Other organs are rarely affected, and cattle can live comfortably until the tumours develop into abscesses. Multicentric cases are very rare — usually one or, at most, a few tumours form in the skin.

SUSPECTED BLUE-GREEN ALGAE POISONING IN CATTLE

Blue-green algae (cyanobacteria) were suspected of causing the sudden deaths of two dairy cows on a farm near Timboon in southwest Victoria in early December. The cows were being dried off and had been introduced to a fallow paddock with access to a small dam that had a surface scum. One cow was found dead two days later, and the other died the next day after a very short period of illness. The weather leading up to the event was warm, humid and windy.

The differential diagnoses included acute bovine liver disease, mycotoxicosis and bracken fern poisoning. Blue-green algae poisoning was the favoured diagnosis, based on the history and

histological findings. No toxic algae were found in the water sample collected, but algal blooms are often transitory, and may have dispersed before sampling.

SCABBY MOUTH IN SHEEP

In November, 330 recently purchased White Suffolk ewes showed lesions consistent with scabby mouth (contagious ecthyma) on a property near Goornong, northwest Victoria. The sheep had been purchased 10 days earlier, and during crutching 12 were found to be lame. The outbreak was thought to be due to stresses of transport and yarding, combined with grazing on stubbles, humid environmental conditions and immunologically naïve sheep.

AVIAN TUBERCULOSIS IN PIGS

The prevalence of mycobacterial lymphadenitis in pigs in Victoria appears to be increasing, based on the number of herds from which samples have been submitted for laboratory examination. Samples from 22 herds were submitted in 2005, with 11 herds being confirmed positive by histopathology or polymerase chain reaction (PCR). *Mycobacterium avium* was identified as the most common organism. These findings are consistent with the fact that *M. bovis* and *M. tuberculosis* have not been found in pigs in Victoria in recent years. It has been suggested that this disease may be more common in eco-shelter management systems (which are becoming more popular in the pig industry) than in the traditional intensively housed systems.

ROSS RIVER VIRAL INFECTION IN HORSES

In December 2005, five horses were Ross River virus (RRV) antibody-positive on the Bellarine Peninsula near Geelong in southern Victoria. Four showed clinical signs suggestive of RRV infection, including lethargy, pyrexia, petechial haemorrhages and joint swelling.

RRV is a mosquito-borne zoonotic agent, and the Bellarine Peninsula is a notorious mosquito breeding ground. All five horses developed significant concentrations of RRV IgM antibodies, indicating recent infection.

Despite a good association between RRV IgM titres and clinical disease, RRV disease has never been experimentally reproduced in horses.

ENTEROTOXAEMIA IN SUCKING GOAT KIDS

In October 2005, 8 out of 96 3-month-old Boer goats died on a farm near Sale in East Gippsland over one week. The owner observed a slight dark scour and depression in some animals during the 24 hours before death. Autopsy of one animal led to a diagnosis of enterotoxaemia. The animals had not been vaccinated against enterotoxaemia as they were being raised for the 'chemical-free' market.

COCCIDIOSIS IN GOATS

Investigations into a scouring mob of Boer goats near Dunolly, northwest Victoria, resulted in a diagnosis of coccidiosis. Previous investigations in August had found clinically significant internal parasite burdens, but despite anthelmintic treatment, some animals continued to scour. Coccidiosis was diagnosed based on histological findings (large numbers of coccidia in the ileocaecal valve and small intestine, and moderate diffuse enteritis). Previous parasite burdens, management stresses (e.g. frequent handling to drench and short paddock rotations with sheep) and high stocking densities are likely to have contributed to this problem.

INCREASED AWARENESS OF AVIAN DISEASES AROUND MELBOURNE

Increased media reporting and public awareness-raising activities have increased public interest in ruling out avian influenza as a cause of observed disease in birds in the Melbourne region. In all cases, avian influenza has been excluded; causes of death in birds have included mycoplasmosis, aspergillosis, predation, trauma and malicious poisoning.

PSITTOCOSIS IN CRIMSON ROSELLAS AND HUMANS

Crimson rosellas died at the rate of three to five per week, over an 8-week period in October and November 2005, at a holiday retreat near Yarram in South Gippsland. A smaller outbreak occurred at the same time in 2004. Individual birds appeared to be lethargic on one day and were found dead the next.

Laboratory autopsy examination of two dead birds showed an enlarged liver and an enlarged and pale spleen with the presence of chlamydial elementary bodies in both organs. Four humans (the two owners of the retreat and two locals residing within 500 m of the retreat) contracted psittacosis. Three were hospitalised and one was in intensive care for several days. Mowing grass that contained droppings from these birds was considered an important aspect of the epidemiology of the human disease.

The owners of the retreat now use facemasks when mowing the four hectares of grass, and have removed the wild bird feeding stations.

ASPERGILLOSIS IN A BACKYARD DUCK FLOCK

On a property east of Melbourne, 6 out of 35 ducks died when freshly mulched trees were applied as litter in open-air duck and chicken runs in mid-October. The mulch was introduced three weeks before the deaths. Clinical signs included diarrhoea, lethargy, weight loss and dyspnoea followed by death. Surviving ducks showed milder signs that included an ocular discharge. Aspergillosis was suspected and the owner was advised to remove the mulch. Two freshly dead entire ducks were submitted for laboratory examination and exclusion of avian influenza. Autopsy confirmed aspergillosis. No further deaths have occurred, and no chickens were affected.

Western Australia

Contributed by:
Fiona Sunderman
Department of Agriculture, WA

During the quarter, 243 investigations of animal disease resulted in laboratory testing, and there were eight exotic disease alerts and no notifiable disease reports.

All eight exotic disease investigations were Category 1 alerts (low index of suspicion). They involved routine exclusion of avian influenza and Newcastle disease in seven disease investigations in poultry and avian species. One investigation in pigs ruled out porcine reproductive and respiratory syndrome (PRRS) and Aujeszky's disease. A diagnosis of an endemic disease was made in all cases.

DISEASES OF SIGNIFICANCE

Avian

Algal toxicity, possibly due to *Cylindrospermopsis* sp., is suspected to have caused sickness and deaths in a small flock of aged layers on a Bindoon property. Over a 2-week period, 25 out of 50 birds died, after loss of egg production, depression and cyanotic combs.

Fowl cholera probably caused mortalities in layers at Wubin following the introduction of new birds to the flock. Sick birds displayed a mucoid ocular and nasal discharge over a 3-day period before dying.

Respiratory disease and facial swelling in a flock of bantams at Collie were found to be due to infectious laryngotracheitis. Necropsy of two birds found bilateral periocular oedema, severe blepharitis and yellow caseous material in their nasal turbinates.

Chronic bursal disease was diagnosed in a 4-month-old layer from the Derby area. The bird was one of ten with clinical signs of wasting, paresis or sudden death. Older hens were not affected. There had also been reports of native parrots dying with similar clinical signs.

Bovine

Copper toxicity was diagnosed in a small group of Wagyu (Japanese Black)-cross cattle that became ill 200 days after moving from Eneabba to a feedlot at Treeton. Necropsy of an animal that died revealed a small yellow fibrotic liver. When examined histologically, the liver was found to contain lesions characterised by marked bile ductule hyperplasia and broad seams of fibrous tissue bridging between portal zones and ramifying along sinusoids. The kidney copper concentration was 70 mg/kg and the liver concentration was high, at 2041 mg/kg.

Copper deficiency in calves on a farm in the Pinjarra area was found to be due to high molybdenum levels in the pastures. Serum copper concentrations from four ill-thrifty calves were below detectable levels. The copper concentration in the liver of another calf was 2.8 mg/kg dry weight (reference range 20–250 mg/kg). Pasture copper levels were adequate, but the molybdenum

levels were found to be 9.0 mg/kg dry weight, about 10 times the level normally encountered.

Rickets was an unexpected diagnosis following investigation of a problem of recumbent calves on a property near Bunbury. The animals were unable to stand but were otherwise bright and alert. Clinical examination revealed broken bones in all cases. Examination of a long bone from one animal revealed periosteal fibroplasia, dysplasia of the epiphyseal growth plate, a failure of mineralisation of chondrocytes and an excess of osteoid material in the medulla. Analysis of bone revealed a calcium:phosphorus ratio of 2.7:1 rather than the desired 2:1. Plasma phosphorus in three calves was significantly deficient. The factors contributing to the problem remain to be identified.

Papular stomatitis was detected in poor-condition calves from two farms at Elleker and Redmond. Both groups had been recently purchased from a trader at Manjimup. Investigation found characteristic multifocal circumscribed lesions on the buccal mucosa and planum nasale in all calves on one farm and at least ten calves on the other.

Bovine virus diarrhoea was the cause of diarrhoea and deaths in 10 out of 82 4-month-old calves at Denmark. Later, a 2-year-old heifer became affected. Clinical examination revealed yellow granular patches on the oral labia, gingiva and hard palate, as well as erosion of papillae on the tip and edges of the tongue. Immunostaining demonstrated pestivirus antigen in the intestinal mucosa, skeletal muscle, kidney and forestomachs.

Ovine

Orchitis in 5–10% of a flock of 1000 Dorset rams from Popanyinning was investigated. Over the past 7–8 years, approximately 100 rams have been culled due to swollen testicles. *Histophilus somni* was isolated from the epididymis of one of two rams from which cultures were submitted. This bacterium has been associated with epididymoorchitis in young, unmated rams (usually less than one year old). In contrast, there was evidence of testicular tubular atrophy with thrombosis and haemorrhage within the spermatic cord in the testicle of a third ram, both lesions being consistent with trauma.

Eperythrozoonosis caused lethargy, anaemia and the deaths of 15 out of 270 rams aged 3–6 months at Moora. Histopathological examination of the liver of one lamb revealed subacute periacinar necrosis, a degenerative change consistent with hypoxia due to anaemia. *Eperythrozoon ovis* infestation was confirmed by ELISA.

In feedlot sheep, rumenitis or salmonellosis was responsible for diarrhoea and deaths in mixed sex and age merino and merino-cross sheep near Mooraf. Of 60 000 sheep, approximately 1500 died and another 12 000 had scouring. One sheep that had been in the feedlot for only 36 hours had severe multiple microscopic lesions of rumenitis, but normal intestines. Three others that had been in the feedlot for 1–2 weeks had intestinal lesions. *Salmonella* spp. were recovered from cultures of abomasum, ileum, and mesenteric and ileocaecal lymph nodes.

Copper toxicity was thought to be the cause of death of 40 out of 400 weaner sheep at Lake Grace. Necropsy of one weaner revealed jaundice but little else, although on histopathological examination there was liver necrosis and, in the kidney, tubular necrosis. The renal copper concentration was 46 mg/kg, which is well above the normal range but a little less than might be expected in copper toxicity. The source of copper was not identified.

Erysipelas was diagnosed in merino lambs at Mount Walker that had been mulesed and castrated a week previously. Of 1100 lambs, 20 died and another 40 were sick. Swollen joints were detected at the post mortem examination of two lambs, and *Erysipelas rhusiopathiae* was easily recovered from culture of joint swabs and joint fluid.

Urolithiasis was diagnosed in a flock of Merino wethers aged 3.5–4 years in a paddock at Three Springs. Sheep deaths have occurred in that particular paddock for the past few years, and the property has had a history of urolithiasis in summer pastures. The sheep examined had swollen kidneys, with cortical haemorrhage evident. Additionally, the mucosa of the urinary bladder was haemorrhagic and contained necrotic foci, and numerous small uroliths were present in the lumen.

Quarterly disease statistics

Control activities

OVINE BRUCELLOSIS

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

Table 1 Ovine brucellosis accredited-free flocks at 31 December 2005

State	Free
NSW	757
NT	0
QLD	54
SA	495
TAS	92
VIC	614
WA	150
AUS	2162

ENZOOTIC BOVINE LEUCOSIS

Enzootic bovine leucosis accreditation programs have been operating in the dairy industries in Queensland and New South Wales for several years. Victoria, South Australia, 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 enzootic bovine leucosis at the end of the quarter.

Table 2 Dairy herds tested free of enzootic bovine leucosis at 31 December 2005

State	Free	Herds
NSW	1027	1046
NT	0	0
QLD	892	897
SA	411	411
TAS	525	525
VIC	6167	6227
WA	260	260
AUS	9282	9366

JOHNE'S DISEASE

In Australia, Johne's disease occurs primarily in dairy cattle and sheep, and to a lesser extent in beef cattle, goats, deer and camelids. Infection with sheep strains occurs to varying extents across the sheep-producing regions of southern Australia but has not been detected in Queensland. Cattle strains are endemic in southeastern Australia, but surveillance programs have not identified endemic infection in Queensland, Western Australia or the Northern Territory, and active measures are taken to stamp out any incursions. Table 3 shows the number of herds and flocks known to be infected.

Table 3 Number of herds/flocks infected with Johne's disease at 31 December 2005

	Cattle	Deer	Goat	Sheep	Total
NSW	122	1	11	1286	1420
NT	0	0	0	0	0
QLD	0	0	1	0	1
SA	50	2	2	71	125
TAS	16	0	3	57	76
VIC	983	7	9	408	1407
WA	0	0	0	18	18
AUS	1171	10	26	1840	3047

New approaches based on risk assessment and management have been developed to control Johne's disease. Market Assurance Programs are in operation for cattle, sheep, goats and alpacas; the numbers of herds or flocks that have reached a status of Monitored Negative 1 or higher are shown in Table 4.

Table 4 Flocks with a Market Assurance Program status of at least Monitored Negative 1 at 31 December 2005

	Alpaca	Cattle	Goat	Sheep	Total
NSW	110	672	44	416	1242
NT	0	0	0	0	0
QLD	0	0	0	1	1
SA	42	251	15	236	544
TAS	1	107	2	31	141
VIC	19	333	2	96	450
WA	0	0	0	0	0
AUS	172	1363	63	780	2378

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

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

Laboratory testing

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

Table 5 Serological testing from routine submissions to State laboratories

	Akabane		Bluetongue		Bovine ephemeral fever		Enzootic bovine leucosis		Equine infectious anaemia		Equine viral arteritis	
	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests
Oct–Dec 04	540	8337	219	12063	362	1872	0	6562	8	531	3	160
Jan–Mar 05	536	5251	194	2686	278	1610	8	3233	5	481	12	278
Apr–Jun 05	583	2984	288	4279	356	1458	0	2874	3	570	8	251
Jul–Sep 05	476	1936	343	3399	257	1298	2	2330	21	577	13	188
Oct–Dec 05												
NSW	58	154	21	1497	18	357	3	524	0	342	6	184
NT	178	463	118	482	97	464	0	1	0	14	0	0
QLD	124	438	120	1464	106	462	0	285	14	210	0	6
SA	0	476	0	263	24	128	0	675	0	2	0	2
TAS	0	0	0	9	0	0	0	2	0	0	0	0
VIC	0	12	0	27	0	4	0	39	0	151	0	151
WA	23	3383	13	4687	7	171	0	0	0	0	0	0
AUS	383	4926	272	8429	252	1586	3	1526	14	719	6	343

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 nonhuman isolates are published, and detailed data searches are provided on request to NEPSS. Table 6 summarises salmonella isolations from animals notified to NEPSS for the quarter.

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

Table 6 Salmonella notifications, 1 October to 31 December 2005

Serovars	Avian	Bovine	Canine	Caprine	Equine	Feline	Ovine	Porcine	Other	Total
***S.* Bovismorbificans**	0	13	1	0	1	0	0	0	0	15
***S.* Dublin**	0	42	0	0	1	0	0	0	0	43
***S.* Infantis**	0	1	5	0		1	0	0	0	7
***S.* Typhimurium**	8	57	8	1	22	5	15	1	3	120
Other	2	22	12	0	7	3	5	2	20	73
Total	10	135	26	1	31	9	20	3	23	258

ZOONOSES

The National Notifiable Diseases Surveillance System (NNDSS) of the Communicable Diseases Network Australia collects statistics about many human diseases. A summary of information about five important zoonoses is submitted to the National Animal Health Information System each quarter (see Table 7).

Contact: Communicable Diseases Intelligence, Australian Government Department of Health and Ageing
www9.health.gov.au/cda/Source/CDA-index.cfm

Table 7 Notifications of zoonotic disease in humans

	Brucellosis[a]	Leptospirosis	Listeriosis	Ornithosis	Q fever
Oct–Dec 04	16	25	14	54	120
Jan–Mar 05	13	41	15	42	90
Apr–Jun 05	2	36	12	53	113
Jul–Sep 05	8	25	11	40	81
Oct–Dec 05					
ACT	0	0	1	1	0
NSW	1	12	6	26	37
NT	0	0	0	0	1
QLD	13	9	3	0	31
SA	0	4	4	0	3
TAS	0	0	0	0	0
VIC	0	4	3	11	6
WA	0	1	0	1	2
AUS	14	30	17	39	80

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

NATIONAL TSE SURVEILLANCE PROGRAM

The National Transmissible Spongiform Encephalopathies Surveillance Program (NTSESP) is an integrated national program jointly funded by industry and governments to demonstrate Australia's ongoing freedom from bovine spongiform encephalopathy and scrapie, and to provide early detection of these diseases should they occur. Table 8 summarises the activity of the program over the past five quarters. All specimens tested were negative for TSEs. Information about the NTSESP is available on the internet (at www.animalhealthaustralia.com.au/aahc/programs/adsp/tsefap/ntsesp.cfm).

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

Table 8 TSE surveillance

	Oct–Dec 04		Jan–Mar 05		Apr–Jun 05		Jul–Sep 05		Oct–Dec 05	
	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep
NSW	23	30	13	19	26	30	33	36	24	26
NT	4	0	0	0	15	0	6	0	5	0
QLD	31	5	29	0	33	7	53	6	34	1
SA	3	6	3	7	6	18	4	10	4	7
TAS	2	10	4	6	3	0	3	1	0	0
VIC	23	24	15	10	31	35	40	58	78	52
WA	8	77	5	62	8	17	9	9	10	67
AUS	94	152	69	104	122	107	148	120	155	153

NORTHERN AUSTRALIA QUARANTINE STRATEGY

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

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

Table 9 Summary of recent NAQS activity in Australia

	Oct–Dec 04		Jan–Mar 05		Apr–Jun 05		Jul–Sep 05		Oct–Dec 05	
	Total	+ve	Total	+ve	Total	+ve	Total	+ve	Total	+ve
Aujeszky's disease	157	0	73	0	72	0	65	0	13	0
Avian influenza – highly pathogenic	107	0	122	0	186	0	58	0	0	0
Classical swine fever	157	0	73	0	72	0	65	0	13	0
Japanese encephalitis[a]	196	5	86	28	54	0	0	0	89	0
Surra – *Trypanosoma evansi*	69	0	117	0	77	0	79	0	84	0

a In 1995–97, animals at sentinel sites on islands in the Torres Strait, but not the Australian mainland, seroconverted to Japanese encephalitis (JE) 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, sentinel pigs 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 reintroduced from the island of New Guinea in monsoonal weather.

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 were 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 under ISO/IEC 17025.

Laboratories approved for culture of *Mycobacterium bovis* must pass an external quality assurance program run by the Australian reference laboratory for bovine tuberculosis on an annual basis. Tables 10 and 11 summarise results from the program.

Table 10 Results from National Granuloma Submission Program

	TB +ve	Submitted
Oct–Dec 04	0	1184
Jan–Mar 05	0	650
Apr–Jun 05	0	760
Jul–Sep 05	0	540
Oct–Dec 05	0	488

Table 11 National case register for bovine tuberculosis

	BTEC-impending free			TFAP-free					TFAP2		
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
NSW	1	0	0	0	0	0	4[1]	0	0	0	0
NT	5	3[2]	4	2	1	0	0	2[2]	0	0	0
QLD	1	1	2	2[3]	0	2	3[1]	1[1]	0	0	0
SA	0	1	0	0	0	0	0	0	0	0	0
TAS	0	0	0	0	0	0	0	0	0	0	0
VIC	0	1[3]	0	0	0	0	0	0	0	0	0
WA	1	1	1	1	0	0	0	0	0	0	0
AUS	7	7	7	5	1	2	7	3	0	0	0

Definitions: Primary cases are those detected in case herds. Case herd is a herd in which a case of TB has been found, that was previously tested negative, monitored negative or confirmed free 1, 2 or 3 (excluding secondary case herds) as defined in the TB standard definitions and rules. Secondary cases are those detected in secondary case herds. A secondary case herd means a herd found to be infected with tuberculosis following tracing from a case herd.
1. These cases are secondary to the case detected in Queensland in December 2000
2. Buffalo herd
3. One secondary case

BOVINE BRUCELLOSIS

Although bovine brucellosis is now exotic to Australia, surveillance is maintained through abortion investigations and miscellaneous testing of cattle for export or other reasons. As shown in Table 12, a total of 201 abortion investigations were performed during the reporting period, all with negative results for bovine brucellosis.

Table 12 Surveillance for bovine brucellosis

	Abortion		Other reasons	
	+ve	Tests	+ve	Tests
Oct–Dec 04	0	247	0	3502
Jan–Mar 05	0	358	0	796
Apr–Jun 05	0	253	0	1748
Jul–Sep 05	0	343	0	1430
Oct–Dec 05				
NSW	0	8	0	144
NT	0	0	0	0
QLD	0	66	0	492
SA	0	18	0	0
TAS	0	10	0	5
VIC	0	4	0	42
WA	0	95	0	355
AUS	0	201	0	1038

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 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 13 shows the number of times that insect trap sites were inspected for the Port Surveillance Program; no exotic insects or mites were detected.

Contact: Leigh Nind and Howe Heng, Biosecurity Australia, DAFF

Table 13 Ports Surveillance Program: number of inspections of insect traps

	Oct–Dec 04	Jan–Mar 05	Apr–Jun 05	Jul–Sep 05	Oct–Dec 05
Ports					
Asian bees	6	7	6	6	6
Varroa mites	21	18	23	19	18
Asian mites	21	18	23	19	18
Tracheal mites	18	17	22	17	18
Culicoides sp	31	28	29	27	28
Screw-worm fly	23	28	29	29	24
NAQS					
Screw-worm fly	45	45	45		45

NATIONAL RESIDUE SURVEY

There were 4379 samples collected and analysed for the quarter. The only samples with residues above the relevant standard in the Australian Food Standards Code were for lead in liver of cattle (one), pigs (one) and sheep (one), and for cadmium in sheep liver (four). Lead residue detections levels ranged from 0.569 mg/kg to 0.71 mg/kg where the Australian Maximum Level (ML) is 0.5 mg/kg. Traceback investigation reports suggested exposure of the pig to flaking lead paint, but lead sources were not identified for the residues in the beef or sheep liver. While the cadmium detections were above the ML of 1.25 mg/kg for sheep liver, they were all below the action level of 2.5 mg/kg to initiate a traceback investigation. The results are summarised in Table 14.

Contributed by: Jason Lutze, National Residue Survey, DAFF

Table 14 National Residue Survey, 1 October to 31 December 2005
Each pair of figures gives the number of samples above the maximum residue limit (MRL) or the maximum permitted concentration, and the number of samples tested.

	NSW		NT		QLD		SA		TAS		VIC		WA		AUS	
Anthelmintics																
cattle	0	59	0	1	0	92	0	8	0	5	0	37	0	13	**0**	**215**
pigs	0	27	0	2	0	19	0	9	0	0	0	23	0	9	**0**	**89**
sheep	0	113	0	0	0	9	0	46	0	4	0	68	0	84	**0**	**324**
other	0	27	0	0	0	9	0	10	0	0	0	29	0	5	**0**	**80**
Total	0	226	0	3	0	129	0	73	0	9	0	157	0	111	**0**	**708**
Antimicrobials																
cattle	0	102	0	0	0	117	0	16	0	3	0	63	0	12	**0**	**313**
pigs	0	82	0	0	0	51	0	26	0	1	0	53	0	29	**0**	**242**
poultry	0	50	0	0	0	8	0	12	0	4	0	16	0	14	**0**	**104**
sheep	0	124	0	0	0	8	0	57	0	1	0	69	0	91	**0**	**350**
other	0	10	0	2	0	10	0	7	0	0	0	37	0	1	**0**	**67**
Total	0	368	0	2	0	194	0	118	0	9	0	238	0	147	**0**	**1076**
Growth promotants																
cattle	0	68	0	2	0	138	0	11	0	7	0	31	0	17	**0**	**274**
pigs	0	47	0	0	0	36	0	28	0	0	0	40	0	24	**0**	**175**
poultry	0	7	0	0	0	1	0	2	0	0	0	2	0	2	**0**	**14**
sheep	0	89	0	0	0	6	0	32	0	2	0	38	0	69	**0**	**236**
other	0	3	0	0	0	6	0	4	0	0	0	21	0	0	**0**	**34**
Total	0	214	0	2	0	187	0	77	0	9	0	132	0	112	**0**	**733**
Insecticides																
cattle	0	108	0	0	0	144	0	18	0	7	0	60	0	23	**0**	**360**
pigs	0	30	0	0	0	15	0	11	0	0	0	20	0	9	**0**	**85**
sheep	0	177	0	0	0	15	0	76	0	3	0	91	0	109	**0**	**471**
other	0	44	0	0	0	62	0	22	0	0	0	32	0	4	**0**	**164**
Total	0	359	0	0	0	236	0	127	0	10	0	203	0	145	**0**	**1080**
Metals																
cattle	1	20	0	0	0	36	0	8	0	2	0	14	0	4	**1**	**84**
pigs	1	23	0	0	0	20	0	12	0	0	0	24	0	9	**1**	**88**
sheep	1	30	0	0	0	2	0	9	0	1	0	27	4	26	**5**	**95**
other	0	18	0	0	0	25	0	9	0	0	0	10	0	6	**0**	**68**
Total	3	91	0	0	0	83	0	38	0	3	0	75	4	45	**7**	**335**
Miscellaneous																
cattle	0	38	0	0	0	65	0	10	0	5	0	31	0	11	**0**	**160**
pigs	0	32	0	0	0	37	0	23	0	0	0	50	0	24	**0**	**166**
sheep	0	30	0	0	0	1	0	13	0	0	0	19	0	21	**0**	**84**
other	0	12	0	1	0	10	0	2	0	0	0	12	0	0	**0**	**37**
Total	0	112	0	1	0	113	0	48	0	5	0	112	0	56	**0**	**447**

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

SUSPECT EXOTIC OR EMERGENCY DISEASE INVESTIGATIONS

There were 46 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 the State and Territory reports.

Table 15 Exotic or emergency disease investigations reported from 1 October to 31 December 2005

Disease	Species	State	Month	Response	Finding
Anthrax	Bovine	SA	Oct	2	annual ryegrass toxicity
	Bovine	TAS	Dec	2	negative
	Bovine	VIC	Oct	1	negative
	Bovine	VIC	Oct	2	negative
	Bovine	VIC	Nov	1	negative
	Bovine	VIC	Dec	2	negative; 2 unrelated investigations
Aujeszky's disease	Porcine	WA	Dec	3	negative
Avian influenza – highly pathogenic	Avian	NSW	Oct	3	neck trauma
	Avian	NSW	Oct	2	negative
	Avian	NSW	Oct	2	heart failure
	Avian	NSW	Oct	2	chlamydiosis
	Avian	NSW	Oct	2	respiratory disease complex
	Avian	NSW	Nov	2	suspected botulism
	Avian	NSW	Nov	2	suspected poisoning
	Avian	NSW	Nov	2	starvation
	Avian	NSW	Nov	2	negative; 2 unrelated investigations
	Avian	NSW	Dec	2	negative
	Avian	NSW	Dec	3	suspected botulism; 2 investigations
	Avian	NSW	Dec	2	infectious coryza
	Avian	NSW	Dec	2	negative
	Avian	NSW	Dec	2	enteritis and typhlitis
	Avian	NSW	Dec	5	Marek's disease
	Avian	NT	Oct	3	negative
	Avian	QLD	Nov	2	negative
	Avian	TAS	Nov	3	negative
	Avian	TAS	Dec	3	negative; 2 unrelated investigations
	Avian	VIC	Oct	2	aspergillosis
	Avian	VIC	Nov	2	diazinon poisoning
	Avian	VIC	Nov	2	negative
	Avian	WA	Oct	3	negative
	Avian	WA	Nov	3	negative; 6 unrelated investigations
	Avian	WA	Dec	3	negative
Duck virus hepatitis	Avian	TAS	Nov	3	negative
Foot-and-mouth disease	Bovine	NSW	Oct	3	photosensitisation
Hendra virus	Equine	NT	Oct	3	negative
	Equine	QLD	Oct	3	negative
Newcastle disease – virulent	Avian	TAS	Dec	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

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.animalhealthaustralia.com.au/status/nahis.cfm). Because NAHIS does not duplicate the data in the other systems, the relevant person below should be contacted if further details are required.

Name	Role	Phone	Fax	email
Chris **Bunn**	Emergency Disease Preparedness, DAFF	02 6272 5540	02 6272 3372	chris.bunn@daff.gov.au
Iain **East**	Australian Government NAHIS Coordinator	02 6272 3106	02 6272 3150	Iain.east@daff.gov.au
Ian **Haynes**	Australian Milk Residue Analysis Survey	03 9810 5901	03 9819 4299	ihaynes@dairysafe.vic.gov.au
Jenny **Hutchison**	National Surveillance Coordinator	02 6287 4483	02 6287 4468	jenny@ausvet.com.au
David **Kennedy**	Johne's Disease Coordinator	02 6365 6016	02 6365 6088	david@ausvet.com.au
Jonathan **Lee**	Northern Australia Quarantine Strategy	07 4030 7853		Jonathan.lee@daff.gov.au
Diane **Lightfoot**	National Enteric Pathogen Surveillance Scheme	03 8344 5701	03 8344 7833	dligh@unimelb.edu.au
Peter **Miller**	National Residue Survey	02 6272 3762	02 6272 4023	peter.miller@daff.gov.au
Duncan **Rowland**	Animal Health Australia Program Manager	02 6203 3910	02 6232 5511	drowland@animalhealthaustralia.com.au
Neville **Spencer**	National Granuloma Submission Program	02 6271 6650	02 6272 5442	neville.spencer@aqis.gov.au
John **Walker**	Communicable Diseases Intelligence	02 6289 1555	02 6289 7791	www.health.gov.au
Rupert **Woods**	Australian Wildlife Health Network	02 9978 4749	02 9978 4516	rwoods@zoo.nsw.gov.au
State Coordinators				
Barbara **Moloney**	NSW State Coordinator	02 6391 3687	02 6361 9976	barbara.moloney@dpi.nsw.gov.au
Francois **Human**	NT State Coordinator	08 8999 2246	08 8999 2024	francois.human@nt.gov.au
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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 any potential disease situation. Anyone suspecting an exotic disease outbreak should use this number to get immediate advice and assistance.

For information about the Disease Watch Hotline, contact Jane McBride, Animal Health Australia