ANIMAL HEALTH SURVEILLANCE QUARTERLY
Newsletter of Australia's National Animal Health Information System

Volume 2 **Issue 1**

Quarterly Report for 1 January to 31 March 1997

Preface

This issue of the Animal Health Surveillance Quarterly summarises the findings of disease surveillance and monitoring activities reported to the National Animal Health Information System (NAHIS) for the period from 1 January to 31 March 1997. Summary data are collated from a variety of sources, including State Departments of Agriculture, the Australian Quarantine and Inspection Service, the National Residue Survey, the Commonwealth Department of Health and Family Services and various national reference laboratories. Only summary information is recorded in NAHIS, with detailed data being maintained by the source organisation.

The information included in this report is accurate at the time of publication. However, because of the short reporting and production time, minor discrepancies may occur.

This issue includes a lead article on the release of rabbit calicivirus as a biological control agent against rabbits, comments on the recent anthrax outbreak in Victoria, as well as highlights of disease surveillance activities, items of interest from the States and Territories, and a summary of quantitative data for the quarter. This issue is also available on the internet through the NAHIS worldwide web site.

I commend this report as a reference document and trust that you will find it useful.

GARDNER MURRAY
Australian Chief Veterinary Officer

Contents

Rabbit Calicivirus — Human Health Study

In 1996, rabbit calicivirus (RCV) was approved as a biological control agent for wild rabbits in Australia. As part of the assessment a study into potential human health effects of exposure to RCV was undertaken. This report briefly describes this study and subsequent developments.

Background

In 1989, Australia and New Zealand began investigations into RCV as a possible biological control agent for wild rabbits. RCV was imported into the microbiologically secure Australian Animal Health Laboratory (AAHL) in 1991 and testing commenced for its species specificity and efficacy. There was no evidence from these studies that RCV infects species other than European rabbits (Oryctolagus cuniculus), confirming overseas work.

Following the promising laboratory studies, field trials of RCV commenced on Wardang Island, South Australia in March 1995. RCV subsequently escaped from quarantine – on 4 October 1995 rabbits with RCV were found at two sites outside the trial site on Wardang Island. On 15 October RCV was confirmed in a rabbit found at Point Pearce, on the mainland adjacent to Wardang Island. Despite the implementation of contingency plans to eradicate the disease, the virus continued to spread. When RCV was confirmed at two places hundreds of kilometres

from the initial outbreak, Yunta and the Flinders Ranges, eradication was no longer considered feasible and attempts to eradicate the disease were abandoned. RCV continued to spread rapidly across South Australia and by December 1995 it was found as far as the Queensland border and near Broken Hill in New South Wales. The spread slowed over summer but in March 1996 RCV was reported in central Victoria and it continued to spread in Victoria and into New South Wales.

Despite the escape, assessment of deliberate release of RCV continued under the Commonwealth Biological Control Act 1984 which establishes a process for assessing biological control agents and authorising release programs. The Act requires public consultation and one of the main concerns raised was the perceived potential for rabbit calicivirus to infect species other than rabbits, including humans.

Although scientific literature provided no evidence that RCV affects animals other than rabbits, the lack of reports of any investigations into human health impacts meant that health authorities were able to give only heavily qualified advice as to the safety of RCV. A survey of people known to have had contact with RCV was thought to be an appropriate method for assessing potential human health implications of exposure to the virus.

The Minister for Primary Industries and Energy announced in April 1996 a health study on Australians with occupational exposure to rabbit calicivirus. A Rabbit Calicivirus Human Health Study Group, consisting of representatives from the Department of Health and Family Services, the Bureau of Resource Sciences (Department of Primary Industries and Energy) and independent infectious disease experts was formed to plan and manage the study. The study investigated whether there were any health effects associated with exposure to RCV and involved a health questionnaire and blood sampling to test for any serological reaction to the virus. Advice from overseas laboratories working with rabbit calicivirus was also sought.

The study

International calicivirus experts and laboratories working with RCV were contacted for anecdotal, or other evidence, of any consequences following exposure to RCV-infected material or any evidence of human infection with RCV.

A survey of people with occupational contact with infected rabbits or other exposure to RCV and similar people with no known contact with RCV was undertaken in July 1996. The study required approximately 200 people to be interviewed about their health in the past 12 months and to have blood samples taken for serological testing for RCV antibody.

A large number of people were exposed following the escape of RCV from Wardang Island and the associated attempted eradication campaign in South Australia. The people involved in these operations provided a convenient starting point for the survey. People in Victoria and in the south-east of South Australia, where RCV had arrived more recently, were also included.

Results

Responses were received from 47 overseas laboratories or groups, in 16 countries, working with RCV. These replies confirmed that human infection with RCV is not known to occur and no ill effects have been seen, even in people working very closely with the virus in laboratory and experimental settings.

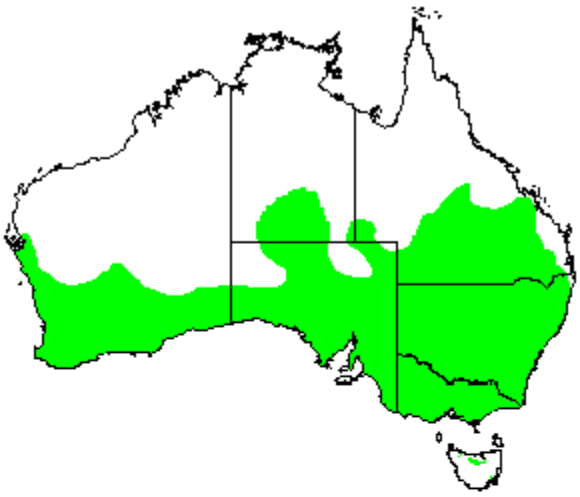
A total of 269 people were interviewed and 259 blood samples were collected from people with variable exposure to RCV-infected rabbits. Serum samples were tested with a competitive enzyme linked immunoassay. There was no evidence of RCV antibodies in any of the samples tested.

Analysis of questionnaire responses did not show any significant difference between levels of illness in those exposed to RCV and those not nor could an association between the exposure to RCV and subsequent bouts of illness be demonstrated.

Discussion

The findings of the RCV - Human Health Study were incorporated into the Bureau of Resource Sciences publication *Rabbit Calicivirus Disease: A Report under the Biological Control Act 1984*. The report publishes the scientific assessment of the issues raised in public submissions and other issues requiring assessment under the *Biological Control Act 1984*. As the Biological Control Authority under this Act, the Commonwealth Minister for Primary Industries and Energy had to be satisfied that he had adequate information before making any recommendation to the Agriculture and Resource Management Council of

Figure 1: Estimated distribution of rabbit calicivirus, April 1997.



Australia and New Zealand. This Council, which includes all Ministers responsible for agricultural management in each State and Territory, had to unanimously support the Minister's recommendations before rabbits and rabbit calicivirus could be declared 'target'and 'agent' organisms respectively under the Act. Rabbit calicivirus was officially declared 'agent organisms' and rabbits declared 'target organisms' under the Biological Control Act on 18 September 1996.

The first official release of RCV took place at Wagga Wagga, New South Wales on 9 October 1996. Since then RCV has been released from over 400 sites in all States and Territories of Australia. Figure 1 shows the estimated distribution of RCV in Australia at the end of April 1997 based on information supplied from State/Territory agencies.

The impact of RCD on rabbit populations has been variable, with high mortality rates reported from the arid and semi-arid areas of Australia and less impact in other areas.

Contributed by Graeme Garner,
Animal and Plant Health Branch,
Bureau of Resource Sciences

Freedom from Johne's disease in northern Australian cattle

Two objectives of a Meat Research Corporation project were to determine if subclinical Johne's disease (JD) occurs in northern Australian cattle and to determine the suitability of the JD enzyme-linked immunosorbent assay (ELISA) test for such animals.

Current testing for JD includes the use of faecal culture, histopathology, and complement fixation (CF) testing. Faecal culture, while having the advantage of 100% specificity is unsuitable as a test procedure when a rapid diagnosis is required because of the period of time required to produce a result. Histopathological techniques require the slaughter of suspect animals. The CF test has been shown in southern States to have lower specificity and sensitivity than the JD ELISA. The apparent serological prevalence of JD increases from the south to the north of Queensland despite the absence of clinical disease, most likely due to exposure to free-living mycobacteria inhabiting the northern areas.

In 1995 and 1996, 1524 animals were sampled — dairy cattle from the Atherton Tablelands in north Queensland, and beef cattle from north Queensland, Northern Territory and northern Western Australia. Histological and faecal culture results were all negative, supporting previous evidence of the absence of autochthonous JD in these areas. No reactor animals showed clinical evidence suggestive of JD throughout the project.

The specificity of the JD ELISA was determined from this study to be 98.0% for the beef cattle selected and 98.3% for the dairy cattle. This compares with specificities calculated from other studies ranging from 96.4% to 99.8%.

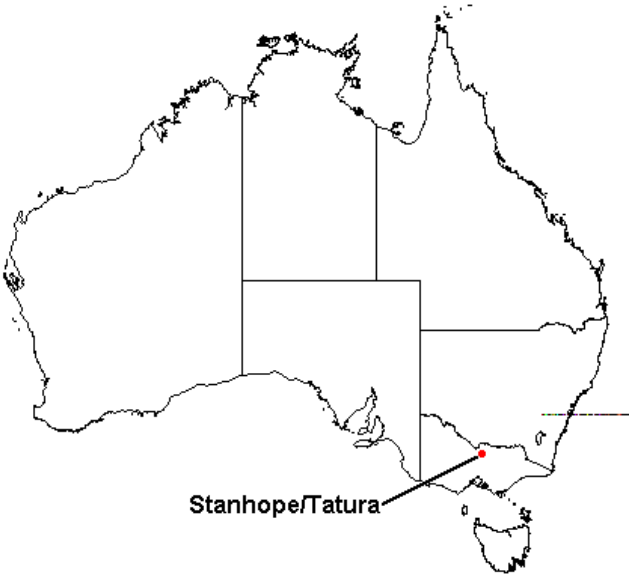
The specificity of the JD ELISA as determined in this study indicated that this test may present logistical and financial problems particularly in the case of live beef breeder exports and any active surveillance (structured surveillance or a random survey to demonstrate the absence of JD) where a test of high specificity is required. The rapid time frame in which a result may be obtained and its ease of use in the laboratory is of value.

Further information about the project may be obtained from David Pitt, Queensland Department of Primary Industries, PO Box 1085, Townsville, QLD, 4810.

An unsual outbreak of anthrax in Victoria

The recent outbreak of anthrax in northern Victoria was exceptional because of the number of farms that became affected in a relatively small area of the State. The area in which the disease occurred is an intensive dairy farming area in the Goulburn Valley, which is made up of small and large irrigated holdings with very high cattle stocking rates. Figure 2 shows the location of the outbreak.

Figure 2: Location of the Victorian anthrax outbreak



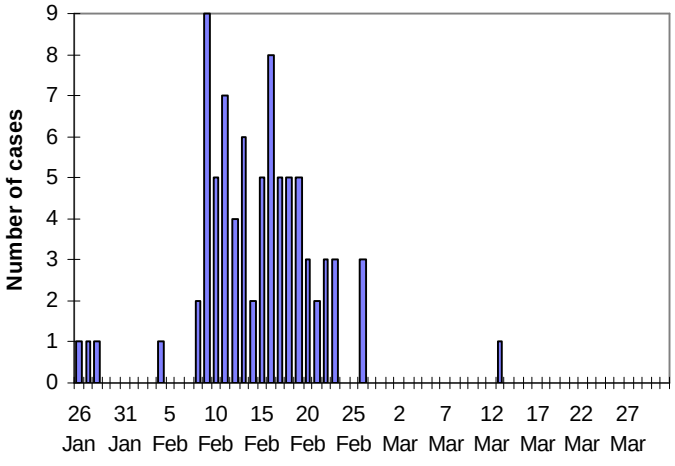
The first case was diagnosed on a dairy farm near Tatura, on Sunday 26 January 1997. This was the first recorded occurrence of anthrax in the area since recording began in Victoria in 1914. The disease was detected on 82 further farms in the Stanhope/Tatura area by 31 March 1997, with the peak of the outbreak occurring in the third week (ending 16 February) – see Figure 3. Between 26 January and 31 March, 202 cattle and 4 sheep were confirmed as infected with anthrax.

Control Procedures on Affected Farms

On each affected farm, the following measures were applied;

- the carcases of infected cattle were either burnt at the site of death and the ashes buried; or wrapped in double thickness plastic, to prevent spillage of body fluids, and removed to a burning site in a disused quarry where they were burned, and the ashes buried;
- the site where the animal died was disinfected with 5% formaldehyde after removal of the carcase;
- all other animals in the affected herd were vaccinated with Sterne strain anthrax vaccine;
- affected properties were quarantined for at least 6 weeks after vaccination or 20 days after the last clinical case, whichever was later;
- any milk collected from a cow showing signs of anthrax within 8 hours of milking was destroyed, along with any other milk that may have been mixed with the suspect milk;
- any movements of susceptible livestock or risk items that had left the property in the 30 days before the first anthrax case were traced, and appropriate action taken where necessary;
- vehicles were required to remain on made roads on infected and vaccinated farms as much as possible; where vehicles had to enter the pasture fields, the vehicle was disinfected before exiting the property; and
- people entering infected properties were required to wear protective clothing and footwear which were disinfected before leaving the property.

Figure 3: Index cases of anthrax recorded on properties throughout the outbreak



Area Control Program

A buffer zone about 30 km (east-west) and 20 km (north-south) was established to include all infected farms (on which one or more clinical cases of the disease occurred) and a surrounding buffer area of 457 vaccinated farms. The whole quarantine buffer zone represents only about 0.19% of Victoria's land mass, with infected farms making up less that 0.04% of Victoria's land mass. All cattle in this buffer area were vaccinated and the property quarantined for a minimum of 6 weeks to cover the withholding period for the vaccine. Vaccination was largely conducted by private veterinarians under contract to the Victorian Department and, in total, some 79,000 cattle were vaccinated.

A surveillance system was set up within the area, with farmers required to notify any suspicious deaths of susceptible livestock. All dead animals, particularly cattle, from around the vaccination buffer zone were tested at the Stanhope knackery for anthrax. Over 400 carcases from areas outside the buffer zone were tested for anthrax and only one was found positive. Over 200 animals, additional to confirmed cases, were tested for anthrax from properties within the buffer zone.

Advice was also provided to local authorities and earth moving contractors to reduce activity in the affected area while the outbreak was active.

Vaccination

Vaccination was very effective in minimising losses after confirmation of the first case on each farm as demonstrated by the fact that of the 83 infected properties, 49 had only one confirmed case. On many of the farms where more than one case of anthrax occurred, it is possible to identify likely reasons for the multiple cases. These include, for the secondary cases, exposure of the herd to the index case, with a resultant opportunity for spread of infection to other animals in the herd.

In mid-February, it became apparent that Australia was going to run out of available vaccine manufactured in Australia. A search of overseas manufacturers found a company in the USA with vaccine on-shelf and capable of meeting Australia's stringent requirements for standards of imported vaccines. Some 150,000 doses were imported to ensure a supply was available to meet Australia's requirements.

Following vaccination it usually takes 10-14 days for animals to develop sufficient immunity to resist infection. There were 12 confirmed cases 11 to 15 days after vaccination, four 16 to 20 days, four 21 to 25 days, three 25 to 30 days, two 31 to 35 days, and one 57 days after vaccination.

In relation to other large outbreaks as recorded in the United States of America and Canada, similar number of cases of anthrax have been recorded after vaccination. It has been observed that the response of individual animals in a vaccinated group will be distributed on a statistically normal curve, with a few animals developing high-grade immunity and a few animals not responding. Poor responses may relate to an inadequate dose of vaccine, an inadequate immune response to a dose of vaccine, or a very high challenge dose overcoming an established but otherwise adequate immunity.

With the lifting of quarantine, all properties have been required to vaccinate introductions and to undertake annual vaccination between 1 May and 31 October in each of the next 2-3 years under legally binding written Agreements with the Victorian Department to undertake these activities. Also in the Agreement is that all vaccinated stock will be withheld from sale or slaughter for 42 days after vaccination.

Predisposing Factors for the Outbreak

Anthrax had not previously been recorded in grazing livestock in the Stanhope/Tatura area. It is probable that the disease occurred in the area last century in association with stock routes, knackeries and boiling-down works. Soil in the area had been disturbed over recent years by major earthworks to improve irrigation efficiency and to remake channel and drainage systems. The possible role of these and other factors is still under investigation.

The outbreak was associated with an unusually prolonged period of hot, dry and humid weather, conditions that have been associated with outbreaks of the disease in Australia and overseas. The 30-year daily maximum temperature of 29°C was exceeded on 26 of the 30 days from 21 January. The relative humidity was below the normal average of 38% on only seven days over the same period. It is possible that weather conditions in January and February 1997 led to soil and environmental temperatures and conditions that enabled anthrax spores to germinate and

generate higher numbers of spores in favourable niches that could infect susceptible animals.

In mid-March, the weather became cooler with the nights much cooler. This and the widespread vaccination campaign saw the number of anthrax cases drop dramatically with only two cases recorded after 16 March.

Epidemiology

No common source of anthrax spores and no common means of spread of anthrax has been identified during the outbreak. It is not possible to determine whether there may have been multiple foci of soil-borne anthrax spores, resulting from previous earthworks and dispersal by flood waters, or whether there has been spread from a few foci of infection. It is possible that some cases might have occurred because of local spread of infection by insects, birds, scavengers or other vectors. However, the available evidence suggests that the latter modes of spread were not a significant cause of anthrax cases.

There was no apparent association with irrigation supply channels. At least five different supply channels provide water to infected farms. Vegetative organisms dispersed in cold water cannot survive and by dilution, and in the cold conditions, could not sporulate.

There were no associations between sources of supplementary feed, milk factory tanker routes, veterinary visits or animal treatments. An analysis of veterinary practitioner visit records was undertaken and showed no evidence of an association between visits made by veterinary practitioners for routine consultations or anthrax vaccination and the occurrence of outbreaks. There was no apparent association between outbreaks and roads, or movement of personnel between farms.

It would be expected that if feed or water had been a source of anthrax, multiple cases would have occurred on many affected farms, rather than a pattern of single index cases observed in this outbreak.

On most infected farms there were areas of poorly drained swampy alluvial soils which might be potential areas for accumulation of anthrax spores. It is possible that this land was contaminated by anthrax spores from previous local flooding episodes, and that this contamination resulted in infection on properties originating from a single index case and by the occurrence of single cases of anthrax on most farms. While there was an apparent association between farms with poorly drained areas and the occurrence of disease, there is a lack of evidence to determine whether this association was causal.

There is no single factor which can explain the temporal and/or geographical distribution of the outbreak. Interpretation of investigation data was made difficult by the vaccination program to control the disease which modified disease expression.

In terms of large previously described outbreaks and how they might have been generated, the outbreak in Louisiana in 1971 would appear to have the most relevant similarities to the Tatura/Stanhope outbreak. In Louisiana, it was postulated that rain water dispersed anthrax spores widely which were then concentrated by a hot dry spell which led to multiplication of anthrax organisms in the environment to levels that were infective for cattle.

Contributed by John Galvin,
Manager, Animal Health Operations,
Agriculture Victoria

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 exotic disease situation. Anyone suspecting an exotic disease outbreak should use this number to get immediate advice and assistance.

Contact: Chris Bunn, Animal Diseases/Incidents (formerly the Foreign Diseases Unit), DPIE.

Northern Australia quarantine strategy

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

The offshore program is designed to provide a better understanding of the animal health status of neighbouring countries and provide early warning of new threats. It involves collaborative programs with Indonesia and Papua New Guinea that include sentinel herds programs and periodic surveys by field teams.

Onshore activities include regular inspections of remote sites, community awareness programs and research designed to provide solutions to specific quarantine problems. The animal disease surveillance program operates within a 20km band which follows the northern shoreline between Broome in Western Australia and Cairns in Queensland, including the Torres Strait islands. Samples are regularly collected from sentinel pigs, cattle and bees located at strategic points on the northern coastline and tested for diseases identified as being a priority in the NAQS animal disease target list. During surveys in various remote sites, diagnostic samples are also collected from a range of species, including wild birds, feral cattle, buffalo, pigs, wild bees and a variety of domesticated animals. Entomologists identify insects collected in traps located as strategic sites to detect incursions of disease vectors and pests.

Exotic pests and diseases of animals on the NAQS target list for which diagnostic samples are collected and screened include Japanese Encephalitis, screw worm fly, surra (*Trypanosoma evansi*), bluetongue, porcine cysticercosis, trichinosis, infectious bursal disease, Avian Influenza, Newcastle Disease, Asian honey-bee, bee mites *(Varroa jacobsoni, Tropilaelaps clareae and Acarapis woodi*) and canine ehrlichiosis (*Ehrlichia canis)*.

Table 1 summarises onshore animal disease data collected by NAQS personnel. Such information will be a regular part of this newsletter in future.

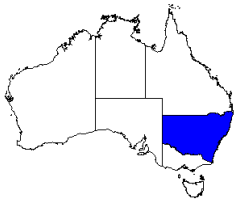
Contact: David Banks, AQIS

Table 1: NAQS surveillance and monitoring data from 1 January to 31 March 1997

Disease	Number of tests/inspections	Results
Japanese Encephalitis	162 sentinel pigs, 30 sentinel cattle, 104 survey animals	Seroconversion identified in 3 sentinel pigs on 18 March 97 on Saibai Island which is only 4km from the Papua New Guinea mainland. Extensive surveying of the Torres Strait islands and Cape York Peninsula indicated that the incursion was limited to Saibai Island only.
Screw Worm Fly	181 clearances of swormlure traps	No *Chrysomya bezziana* detected.
Surra	22 horses, 10 cattle, 4 goats, 7 deer, 1 cat.	All negative by Card Agglutination Trypanosome Test
Taenia solium	No tests in this quarter.	
Trichinosis	51 pigs	Results pending.
Avian Influenza, Newcastle Disease and Infectious Bursal Disease	No tests in this quarter.	
Asian Honey Bee	Surveillance conducted on islands in the Torres Strait Protected and Special Quarantine Zones	No detection except where previously present namely Saibai, Dauan, Boigu Islands.
Varroa and Tropilaelaps mites	Examination of sentinel hives and feral colonies of *A.mellifera.*	No detection
Canine ehrlichiosis	Survey Pending	

State and Territory Reports

New South Wales



Contributed by:
Evan Sergeant
NSW Agriculture

Anthrax

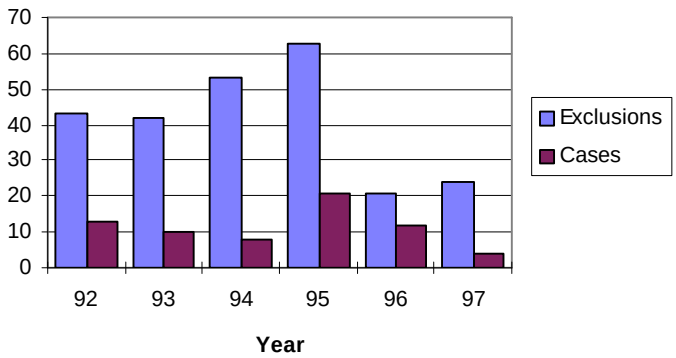
Following the outbreak of Anthrax in Victoria early in the year, a review of recent cases of anthrax in NSW was undertaken.

From January 1992 to March 1997 a total of 68 cases were diagnosed — 34 in beef cattle, 27 in sheep, three in horses and two each in dairy cattle and pigs. Infection was diagnosed or suspected in a second species on the property in five cases, three in sheep and one each in dogs and dairy cattle. All cases were treated according to the current policy, and the disease was rapidly and completely controlled by vaccination and quarantine.

Awareness of the disease is indicated by the fact that there were a further 246 investigations in which anthrax was specifically excluded by laboratory testing (see Figure 4).

Only one case has been well outside the traditional "anthrax belt" being detected because of the tracing and identification of sheep recently moved off an infected property immediately prior to the disease occurring. In this case only one animal was affected, and prompt diagnosis and action prevented further spread of the disease or contamination of the property. This is the only known instance of spread of anthrax by movement of animals in NSW in many years.

Figure 4: Number of anthrax cases and exclusions in NSW, 1992-present



Tuberculosis

Following detection of a granuloma in which TB could not be excluded as a possible cause, a herd of 556 cattle was tested in the Coonamble district. Three reactors to the test were detected. All were young cattle, which is not indicative of infection with the bovine strain of TB.

The three reactors were slaughtered and lesions from head and lungs of one bull were submitted for laboratory examination. At this stage, the lesions appear to be due to actinobacillosis and rhodococcosis rather than TB. However, the herd is being held in quarantine pending finalisation of laboratory investigations.

Tick fever

Tick fever was diagnosed as the cause of death of eight from a herd of 70 cattle in the Cattle Tick Protected Area during January. The whole herd was treated. Four of six sick animals recovered following treatment and two died. Two short-interval whole-herd dippings were carried out to decrease tick worry and the potential for tick fever transmission. There were four deaths from 115 cattle on a neighbouring property, although tick fever was not confirmed. There had been mixing of stock and it seems that the disease was localised to one paddock where both had access.

Bovine ephemeral fever

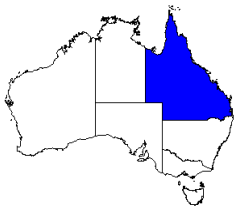
Cases of ephemeral fever have been reported from many districts across the North West region of the State. The Narrabri Rural Lands Protection Board district can be used as an example. In the district there were a total of 60 cases, with three deaths, from total animal numbers of 2797. Two-thirds of these cases were in a herd of 1800 animals. Otherwise the disease was sporadic, with eight herds having only a single case, three herds with two cases and two herds with three cases.

Narrabri experienced major rains over the 1996/97. The district also experienced a major epidemic in Jan–Feb 1996 following major rains with an estimated 80% of herds in the district having up to 15% of stock affected. This contrasts with the level of disease in the preceeding 5 years: a single herd in 1995, no cases during the dry summers of 1994 and 1993, an outbreak with 52 cases in 1992, and a single case in 1991.

Bovine Johne's Disease Market Assurance Program

By the end of March, 1997, a total of 162 cattle herds had achieved the status TN1 and a further 6 achieved the status MN1 under the Market Assurance Program. About three-quarters of these are beef herds. About 25 000 cattle have now been tested in 223 herds, with only 70 reactors detected in 48 herds. Of the 32 reactor herds that have been retested, only one has been positive.

Queensland



Contributed by:
Peter Black
Queensland DPI

Cattle

Cases of babesiosis and anaplasmosis were recorded in more than 40 herds during the quarter. This increased number of detections has been associated with low rates of exposure to tick fever organisms and a consequential increase in the size of the susceptible population. This has occurred because much of Queensland had been experiencing a prolonged drought prior to this summer's rainfall.

Bovine ephemeral fever has also been widely reported with significant stock losses in some herds, especially in heavier classes of cattle.

Blackleg caused the death of six animals on one property in the Darling Downs area. *Clostridium chauvoei* was isolated to confirm the clinical diagnosis. Bovine pestivirus was diagnosed on a number of properties associated with illthrift, sickness and neonatal deaths. Cryptosporidiosis continued to be a problem, mainly in dairy calves. The good summer rainfalls in the south east of the state contributed to several cases of Helminthiasis.

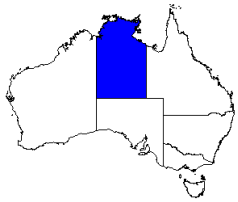
Pigs

Salmonellosis caused 15 deaths in a group of six week old piglets in a Darling Downs piggery.

Horses

Strangles was confirmed by culture of *Streptococcus equi* from thoroughbred horses in the Rockhampton area. Clinical signs included abscess formation in the lymph nodes of the head, fever and nasal discharge.

Northern Territory



Contributed by:
Diana Pinch
NT DPIF

Bats

Australian bat lyssavirus was diagnosed in the NT for the first time in a little red flying fox (*Pteropus scapulatus*) found in the Darwin rural area in January. The bat had improper use of its hind legs, restricted head movement, difficulty in prehension and abnormal vocalisation. Thirty-one bats were examined at Berrimah Veterinary Laboratories during the quarter, with samples from 19 being sent to the Australian Animal Health Laboratory.

This increased number of bat submissions has provided the opportunity to test the bat serum for equine morbillivirus. Several cases with positive titres have been identified.

Cattle

Bovine ephemeral fever was diagnosed in the Alice Springs region during the quarter. The disease is not usually seen so far south, and it is is likely that the amount and extent of rain which fell during the wet season explains the geographic spread of insect vector activity. The disease was also noted in the other regions of the Territory.

Lightning strike accounted for several cattle deaths in the Darwin and Katherine regions during the early part of the quarter. Evidence for these diagnoses includes singed hair, blackened fence wires and burnt grass. It is not an uncommon event in the violent storms of the northern wet season.

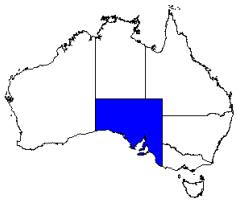
Buffalo

A clinical case of bovine herpesvirus II was seen in a buffalo at a research farm near Darwin. This is an uncommon event and had not been noted previously in the sentinel buffalo, although it is often seen in the sentinel cattle.

Bees

Chalkbrood was diagnosed in two hives in the Darwin area.

South Australia



Contributed by:
Kim Critchley
Primary Industries SA

Administration

Dr Geoff Neumann resigned from his position as South Australia's Chief Veterinary Officer to take up consultancy work. The position is being filled on a temporary basis by Dr Robin Vandegraaff pending the selection of a permanent appointee.

An Apiary Industries Development officer was appointed on a two-year contract to develope a strategic plan for the local industry. It is planned that the SA apiary industry will eventually become less dependent on government regulation and input in its disease control strategies.

The new Livestock Act was passed by Parliament. The regulations are yet to be written.

Enzootic bovine leucosis

The results for the 11th round of Bulk Milk Testing for enzootic bovine leucosis were released and were the 5th consecutive test where no new herds were detected. The results were delayed due to the need to recalibrate the test as there appeared to have been a shift in the sensitivity of the test. The issue has been taken up with the kit's manufacturer.

Ostrich deaths

A farm running 25 adult ostriches lost half the birds over a two-month period. The birds died one at a time, the symptoms being a refusal to eat followed eventually by a period of ataxia within the last few days of life. Postmortem examination revealed birds in good body condition and all organs grossly normal. Clinical chemistry was unhelpful but in some birds an elevated white cell count was evident. A heavy metals screen was also unhelpful. The practitioner attending the farm is continuing investigation but at present the deaths appear to have stopped.

Marine incidents

A scallop kill occurred in the Port Lincoln area with the molluscs showing focal necrosis in the adductor muscle in association with the presence of a *Perkinsus* sp.

A bream kill occurred in the Port River (Adelaide) in association with an algal bloom. Fish submitted to the laboratory were not ideal for an accurate diagnosis and investigations are continuing.

Sheep deaths associated with lupin stubble

The Eyre Peninsula has seen a number of weaner sheep death incidents in association with feeding on lupin stubbles:

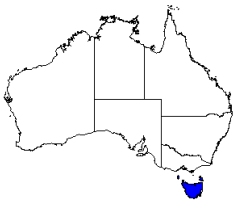
In one case 100 of 300 young weaners died. It was thought originally to have been a copper toxicity problem because copper sulphate had been used to kill algae in troughs. However, an analysis of the water indicated 6500 ppm of salt which suggested the cause was salt poisoning. Water intake on lupin stubbles often rises by 80% and the deaths also coincided with a period of very hot weather when water intake would have been even greater.

Another farm lost 100 weaners attributed to blue green algae toxicity. The loss of a similar number on another farm was thought to be due to lupinosis but where the main lupin stem was found to be negative for the Phomopsis fungus the leaf stems were contaminated. Finally, another property recorded a similar number of deaths but no diagnosis was made.

Bovine ephemeral fever

There were heavy late summer rains in the State's north and many station properties reported animals seen with stiffness of the hind legs or reluctance to stand. Few deaths were reported and the symptoms usually receded after a few days. Blood sampling on a number of these properties has confirmed the presence of antibody to ephemeral fever in both young and old animals.

Tasmania



Contributed by:
John Elliot
DPIF, Tasmania

Abortion storm

During late February and early March, 26 cows out of a herd of 140 aborted. *Neospora caninum* was diagnosed. The source of the outbreak has not been determined. Silage had been brought onto the property. Abortions also occurred on another property that bought silage from the same source.

Enzootic bovine leucosis testing

Many samples collected in the last two quarters have not been tested yet. A problem with the brand of ELISA kits used was first reported from Tasmania, and has also occured in other States.

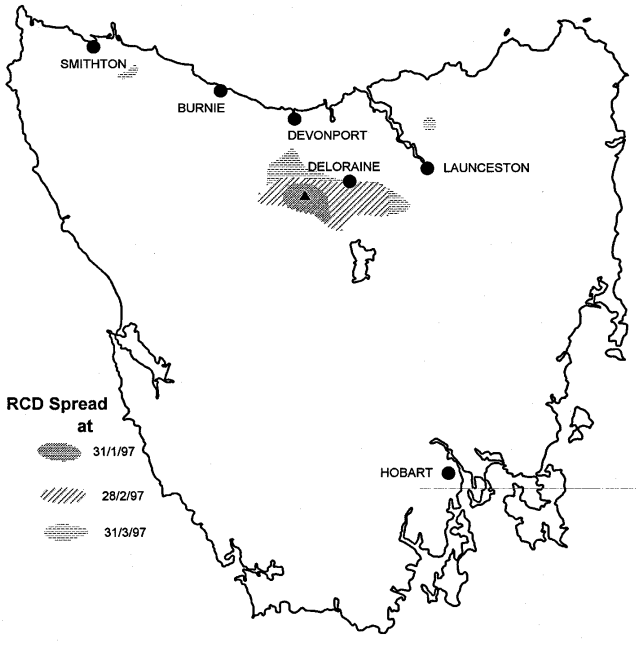
Chalkbrood

Chalkbrood was detected for the first time in Tasmania in bee hives from the Deloraine area. A survey is determining the extent of the disease.

Rabbit calicivirus

This was diagnosed on 6 January 1996 after a major rabbit kill was reported from a district in central northern Tasmania. There was nothing to suggest illegal introduction. Infection may have reached Tasmania on insect vectors blown from mainland Australia during a long period of northerly winds 2 months earlier. Since the first diagnosis, infection has spread to adjoining areas. There have also been other outbreaks on more distant sites, as shown in Figure 5.

Figure 5: Spread of rabbit calicivirus

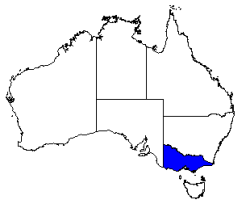


NAHIS web site

http://www.brs.gov.au/brs/aphb/aha

This newsletter is available on the NAHIS web site which is being developed to provide information and statistics about animal health matters in Australia.

Victoria



Contributed by:
John Galvin
Agriculture Victoria

Ovine Johne's disease control program

On 2 January 1997, a control program for ovine Johne's disease was launched in Victoria with the acceptance of a package for compensation arrangements for farmer's undertaking destocking for the control of ovine Johne's disease.

A major stocktake of the control program investigated 182 properties containing 288,236 sheep and showed that at 31 January 1997, there were 33 infected flocks totaling 70,000 sheep. Nineteen of these infected flocks had sheep with clinical disease. There was no clinical disease in the remaining 14 flocks where infection was detected in traceforward of clinically normal sheep. The source of the infection for the 33 flocks was:

- from 1 stud in New South Wales (2 flocks);
- from 1 stud in Tasmania (2 flocks);
- from 1 stud in Victoria (6 flocks);
- 12 contiguous properties in one area infected each other and 7 other properties outside that area; and
- 6 sites have not had a source of infection identified but investigations are continuing.

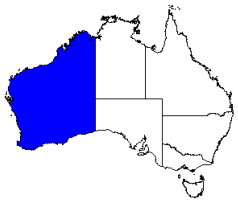
The results of testing and tracing infection can be summarised as:

Method	Number	Positive
AGID test	3478 sheep	66
examination at slaughter and histopathology	237 sheep	47
traceforward investigations	132 flocks	13
traceback investigations	4 flocks	0
owner reports	12 flocks	9
survey	34 flocks	11

As at 31 March 1997, 42 flocks have been demonstrated positive. Compensation of $1,573,566 has been paid to the owners of 28 flocks that have been destocked of 74,500 sheep. As a result of tracing investigations, compensation of $15,196 has been paid to the owners of 17 flocks for slaughter of sheep. Some $12,035.20 has been paid to various people to assist in disposing of unsaleable sheep by digging pits, transporting to knackeries, etc.

The disease has been detected largely in the Gippsland region where 22 of the 42 infected properties are and where 25 of the 42 properties acquired infection. The Gippsland stud sheep breeders intend to accredit their flocks and are very anxious to have the OJD Market Assurance Program launched.

Western Australia



Contributed by:
Richard Norris
Agriculture WA

Footrot success continues

The footrot eradication program has seen a steady reduction in the number of properties in quarantine from 272 in 1991 to 39 by April 1997. This has been due mainly to an increased success in summer eradication programs. During the same period, the success rate has doubled. At least 65% of farmers successfully eradicated footrot last summer compared to 30% over the summer of 1991–92.

Seminars for veterinary practitioners

More than 70 veterinarians from government, university and private practices and laboratories attended the half-day surveillence seminars. The seminars were designed to explain the role all veterinarians play in surveillance for animal disease, and how important the process is in underpinning international trade.

Participants were shown how to use diagnostic laboratories to best effect, how to scan all cases for possible exotic diseases, what legal obligations they operate under, and how to use the internet to find all sorts of animal health information. Networking was stressed as an important component of surveillance, and all rural veterinarians were urged to maintain frequent contact with their local government veterinary officers.

The over-riding message of the seminars was that effective surveillance clarifies the health status of WA livestock, and this improves export performance, enhances farm profitability, and ensures that private veterinary practices remain viable economically. In terms of livestock health, WA is free of many diseases found elsewhere in Australia and overseas, and wants to stay that way.

Risk analysis

Models to examine the risk of introducing disease with livestock imported from Eastern Australia have been completed for liver fluke by Chris Hawkins and for Johne's disease by Tony Martin, together with assistance from other people. A model evaluating WA's footrot import strategy is in its final stages. All models accurately predict past experiences with these diseases. The liver fluke model supports Western Australia's current risk minimisation strategy. The Johne's disease model indicated that the risk was approximately 1 incursion every five years. Moving from individual animal to flock-based testing, such as that required for the Market Assurance Program or equivalent, shifts the risk of incursion by Johne's disease in cattle from one incursion every 5 years to approximately 1 incursion in 100 years.

Cattle

A high mortality rate seen in young heifers on summer pasture in the south-west was due to *Clostridium novyi* type B septicaemia, with attendant liver damage thought to have been caused by toxic algae. Accidental molybdenum poisoning caused deaths in beef cattle at Esperance. *Haemophilus somnus* caused sudden deaths in young cattle, with gross lesions similar to those of bovine pleuropneumonia. Similar lesions caused by *Pasteurella haemolytica* were seen in Limosin calves.

Abattoir-derived specimens with lesions resembling tuberculosis were shown in the laboratory to be due to *Cryptococcus* sp. Chloroma was also seen in a lymph node collected at the abattoir. Cerebellar hypoplasia in calves was probably due to BVD virus infection of the cows. A disease with signs and lesions resembling maple syrup urine disease was seen in cross-bred calves and was diagnosed as congenital cerebral oedema, of unknown cause. Salmonellosis was the cause of abortion in cattle on a south-west farm.

Sheep

Drench gun injury, a condition rarely seen these days, caused the deaths of 40 sheep on a wheatbelt farm. Numerous cases of rumenitis were seen, often in association with secondary lesions such as liver, kidney and lung abscesses — most were due to inappropriate grain feeding. Lupin grain-associated rumenitis was again seen. Oxalate nephrosis occured on several farms, usually associated with oxalate-rich plants. Salmonellosis

caused deaths in several mobs of sheep consuming hay and grain from common ground, and watering from depleted dams. Lupinosis and lupinosis-associated myopathy were widespread and some cases were compounded by hyper-ammonaemia caused by the feeding of urea supplement.

Poultry

The notifiable disease ILT (infectious laryngo-tracheitis) was seen in fancy breed birds in the outer metropolitan area. Elsewhere, a variety of diseases were encountered, including Marek's disease in adults, proventriculitis in chickens, coccidiosis in adult breeders, and an unexplained granulomatous myositis in delicatessen-grade chickens. Aspergillosis was seen in turkeys, avian pox in bantams, and septicaemia in juvenile ostriches.

Pigs

Necrotic enteritis due to *Lawsonia* sp. was seen in young pigs on two properties. Epicarditis due to *Actinobacillus pyogenes* was seen in 60-kg growers. Post-weaning colibacillosis caused heavy mortalities on three properties.

Exotic Disease News

Commonwealth

Chris Bunn presented a paper at the joint annual conference of the Australasian Regional Association of Zoo Parks and Aquaria and Australasian Society of Zookeepers on AUSVETPLAN and how it could affect zoos. The presentation generated a number of questions, partially because of the current situation with lyssavirus.

New South Wales

A display covering exotic animal diseases was arranged at *Emergency Services Expo 97*, Newcastle in February

South Australia

In March, the South Australian department held their annual animal health conference in the Barossa. One day was devoted to exotic disease. This included a 2 hour "hypothetical" exercise using an equine scenario aimed mainly at testing the Animal Emergency Information System (ANEMIS) forms; a session on bat lyssavirus, including a demonstration on handling micro bats (using live bats) and information on BSE, equine morbillivirus, fish health emergencies and the varroa incident at Port adelaide.

Western Australia and Queensland

A series of half-day workshops in Western Australia (see WA report) and a well-attended weekend conference in Rockhampton covering how to investigate suspect exotic disease investigations for veterinary practitioners were held. Commonwealth funding was provided for the running of these activities.

Contributed by: Chris Bunn,
Animal Diseases/Incidents Section, DPIE

Quarterly Disease Statistics

Control activities

Enzotic bovine leucosis

Enzotic bovine leucosis (EBL) accreditation programs have been operating in the dairy industries in Queensland and NSW for several years. Victoria, SA, WA and Tasmania are all undertaking a program of bulk milk testing of all dairy herds. Table 2 shows the number of herds tested free of EBL at the end of the quarter.

Table 2: Dairy herds tested free of EBL at 31 March 1997

	Free	Herds
NSW	1386	1795
NT	0	0
QLD	1713	2027
SA	750	807
TAS	718	810
VIC	5291	8453
WA	455	467
AUST	10 313	14 359

Johne's disease

JD is seen primarily in dairy cattle. It occurs occasionally in beef cattle, sheep and dairy goats, and has been diagnosed in a small number of alpacas. JD occurs in NSW, Victoria, and South Australia. Surveillance programs in Queensland, Western Australia and the Northern Territory beef herd support the view that they are free of JD, and active measures are taken to stamp-out any incursions. Table 3 shows the number of herds and flocks known or suspected to be infected.

Table 3: Herds/flocks with JD at 31 March 1997

	Cattle	Sheep	Goats	Alpacas	Total
NSW	135	161	4	1	301
NT					free
QLD					free
SA	27	0	0	0	27
TAS	32	7	9	0	48
VIC	1643	42	0	11	1696
WA					free
AUST	1837	210	13	12	2072

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. *Brucella abortus* has been excluded as the cause of the reactor found in the third quarter of 1996.

A total of 122 abortion investigations were performed during the reporting period — all with negative results for bovine brucellosis. The results of recent brucellosis surveillance are shown in Table 4.

Table 4: Surveillance for bovine brucellosis

	Abortion Investigations		Test for other reasons	
	Tests	+ve	Tests	+ve
Jan - Mar 96	85	0	1416	0
Apr - Jun 96	196	0	5593	0
Jul - Sep 96	247	0	4227	1
Oct - Dec 96	163	0	4365	0
Jan - Mar 97	122	0	2288	0
NSW	43	0	328	0
NT	0	0	0	0
QLD	45	0	1441	0
SA	0	0	15	0
TAS	11	0	139	0
VIC	0	0	343	0
WA	23	0	22	0

Tuberculosis

Table 5 summarises the results of the National Granuloma Submission Program. The stock inspected come from some domestic abattoirs as well as export abattoirs, and also include some buffalo. In the quarter to 31 March 955 granulomas were submitted but no cases of TB were detected.

There have been no breakdowns of herds reported in this quarter.

Table 5: Results of the National Granuloma Submission Program

	Stock Inspected	Granulomas Submitted	TB +ve
Jan - Mar 96	1 406 772	806	7
Apr - Jun 96	1 484 270	1005	0
Jul - Sep 96	1 497 812	1215	1
Oct - Dec 96	1 393 533	1144	2
Jan - Mar 97	1 428 652	955	0
NSW	560 590	138	0
NT	0	0	0
QLD	501 390	442	0
SA	56 293	147	0
TAS	45 554	68	0
VIC	209 361	50	0
WA	55 464	110	0

Ovine brucellosis

Accreditation programs for ovine brucellosis freedom are operating in most States. Table 6 shows the number of accredited flocks at the end of the quarter.

Table 6: Ovine brucellosis accredited free flocks at 31 March 1997

NSW	NT	QLD	SA	TAS	VIC	WA	AUST
1300	0	62	552	164	791	86	2955

General surveillence

All animals at export establishments are inspected. Table 7 gives the throughput over the past 15 months.

Table 7: Animals inspected at export establishments

	Cattle	Calves	Sheep	Lambs	Pigs	Other domestic species	Feral pigs	Other feral
Jan - Mar 1996	1 385 932	62 299	3 116 582	1 735 586	545 249	268 405	20 254	97 805
Apr - Jun 1996	1 424 305	81 307	2 570 637	1 755 863	578 826	118 468	46 675	91 136
Jul - Sep 1996	1 338 938	159 012	2 006 364	1 756 760	576 569	179 377	58 659	86 162
Oct - Dec 1996	1 315 722	71 153	2 705 503	1 779 745	572 133	180 315	38 839	113 297
Jan - Mar 1997	1 373 175	68 755	2 631 792	1 720 671	509 915	184 562	6 057	93 520
NSW	508 023	65 376	1 296 320	804 865	296 527	113 706	2 222	49 385
NT	57	0	0	0	1 494	18	0	0
QLD	501 225	165	147 439	96 596	65 332	33 440	3 835	2 337
SA	56 705	0	532 375	286 613	1 813	23 029	0	23
TAS	45 436	118	16 933	3 891	0	0	0	0
VIC	206 518	2 843	363 846	281 713	108 575	1 796	0	0
WA	55 211	253	274 879	246 993	36 174	12 573	0	41 775

Laboratory testing

The results of serological testing from routine laboratory submissions for the quarter are shown in Table 8.

Table 8: Serological testing from routine submissions to State laboratories

	Akabane		Bluetongue		Bovine ephemeral fever		Enzootic bovine leucosis		Equine infectious anaemia		Equine viral arteritis	
	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve
Jan - Mar 96	1035	381	5502	261	1662	538	1188	7	345	0	271	3
Apr - Jun 96	980	177	6521	404	1506	461	8918	46	313	1	172	1
Jul - Sep 96	519	97	10000	90	1155	335	7454	51	324	2	173	6
Oct - Dec 96	1042	210	102874	100	1535	481	3130	39	494	0	240	8
Jan - Mar 97	560	88	5064	281	851	203	3256	147	416	0	287	4
NSW	133	34	666	15	193	18	171	1	36	0	84	1
NT	0	0	464	205	192	120	189	13	17	0	0	0
QLD	197	43	3397	61	185	56	361	0	96	0	3	0
SA	53	0	217	0	14	5	0	0	34	0	10	0
TAS	0	0	8	0	0	0	63	0	0	0	0	0
VIC	117	0	291	0	206	0	2459	133	182	0	149	3
WA	60	11	21	0	61	4	13	0	51	0	41	0

Zoonoses

The National Notifiable Diseases Surveillance System of the Communicable Diseases Network Australia New Zealand collects statistics about many human diseases. Table 9 summarises some of the information for zoonoses.

Contributed by: Communicable Diseases Intelligence, Department of Family Services and Health

Table 9: Notifications of zoonotic diseases in humans

Disease	Q1-96	Q2-96	Q3-96	Q4-96	Q1-97	Current quarter							
	Australia				AUST	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
Brucellosis	9	10	8	13	12	0	3	0	8	0	0	1	0
Hydatidosis	11	12	9	17	6	0	0	0	4	0	0	0	2
Leptospiros	64	65	44	55	31	0	5	0	17	0	1	8	0
Listeriosis	16	15	23	19	23	0	9	0	3	1	0	6	4
Ornithosis	27	24	12	24	22	0	0	0	0	1	0	20	1
Q fever	122	135	140	142	139	0	63	0	65	1	0	10	0

Suspect Exotic Disease Investigations

There were 8 exotic disease investigations reported during the quarter and 5 investigations in Victoria for the previous quarter that were not reported in the last newsletter. This is shown in Table 10

Table 10: Exotic disease investigations

Disease	Species	State	Reponse (key below)	Finding
Victoria, 1 October 1996 - 31 December 1996				
Avian influenza	avian	VIC	1	Negative
Avian influenza	avian	VIC	1	E coli septicaemia
Newcastle disease	avian	VIC	1	Negative
Foot and mouth disease	bovine	VIC	1	Bovine Papular Stomatitis
Contagious bovine pleuropneumonia	bovine	VIC	1	Pasteurella pneumonia
Australia, 1 January 1997 - 31 March 1997				
Lumpy skin disease	bovine	NSW	3	Mast cell tumour
Varriosis	bee	NSW	5	Negative
Rabies	fauna	QLD	3	Negative
Contagious bovine pleuropneumonia	bovine	WA	3	Negative
Newcastle disease	avian	WA	3	Negative
Vesicular stomatitis	ovine	WA	3	Negative
Vesicular stomatitis	equine	WA	3	Negative
Newcastle disease	avian	WA	2	Negative

KEY to highest level 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

National Residue Survey

Table 11 summarises the results for the quarter for data collected by the National Residue Survey.

Contributed by: National Residue Survey, Bureau of Resource Sciences

Table 11: National Residue Survey, 1 January to 31 March 1997
Each pair of figures gives the number of samples tested and the number of samples above either the maximum residue limit or the maximum permitted concentration.

	NSW		NT		QLD		SA		TAS		VIC		WA		AUST	
Antimicrobials																
Cattle	129	0	0	0	117	0	19	0	11	0	93	0	30	0	399	0
Pigs	128	4	0	0	76	4	37	0	2	0	78	4	42	0	363	12
Poultry	0	0	0	0	4	0	8	0	0	0	8	0	0	0	20	0
Sheep	56	0	0	0	3	0	22	0	4	0	42	0	20	0	147	0
Other	3	0	0	0	10	0	5	0	0	0	2	0	1	0	21	0
Total	316	4	0	0	210	4	91	0	17	0	223	4	93	0	950	12
Anthelmithics																
Cattle	90	0	0	0	64	0	12	0	7	0	61	0	25	0	259	0
Pigs	25	0	0	0	13	0	6	0	0	0	16	0	9	0	69	0
Sheep	113	0	0	0	13	0	40	0	8	0	81	0	37	0	292	0
Total	228	0	0	0	90	0	58	0	15	0	158	0	71	0	620	0
Growth promotants																
Cattle	136	0	0	0	98	0	21	0	10	0	99	0	23	0	387	0
Pigs	8	0	0	0	6	0	1	0	0	0	6	0	2	0	23	0
Poultry	0	0	0	0	1	0	1	0	0	0	1	0	0	0	3	0
Sheep	118	0	0	0	11	0	30	0	3	0	96	0	36	0	294	0
Other	3	0	0	0	8	0	4	0	0	0	7	0	3	0	25	0
Total	265	0	0	0	124	0	57	0	13	0	209	0	64	0	732	0
Insecticides																
Cattle	407	0	1	0	286	0	53	0	39	0	270	0	77	0	1133	0
Feral	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	0
Pigs	70	0	0	0	30	0	13	0	0	0	46	0	32	0	191	0
Poultry	0	0	0	0	1	0	2	0	0	0	1	0	0	0	4	0
Sheep	380	1	0	0	26	0	114	0	24	0	255	0	113	0	912	1
Other	17	0	0	0	7	0	17	0	0	0	2	0	0	0	43	0
Total	874	1	1	0	353	0	199	0	63	0	574	0	222	0	2286	1
Metals																
Cattle	23	2	0	0	18	1	3	0	2	0	22	1	9	1	77	5
Pigs	14	1	0	0	9	0	2	0	0	0	13	1	3	1	41	3
Poultry	0	0	0	0	1	0	1	0	0	0	1	0	0	0	3	0
Sheep	36	1	0	0	2	0	7	1	0	0	27	5	9	3	81	10
Other	15	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
Total	88	4	0	0	30	1	13	1	2	0	63	7	21	5	217	18

Salmonella surveillance

The National Salmonella Surveillance Scheme (NSSS) 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 the NSSS from participating laboratories around Australia. Table 12 (overleaf) summarises *Salmonella* isolations from animals, notified to the NSSS for the previous quarter.

Contributed by: National Salmonella Surveillance Scheme, Microbiological Diagnostic Unit, University of Melbourne.

Table 12: Salmonella notifications, 1 October to 31 December 1996

Serovars	avian	bovine	canine	equine	feline	ovine	porcine	other	Total
S. bovismorbificans	0	5	1	0	0	2	0	1	9
S. dublin	0	28	0	0	0	0	1	1	30
S. infantis	0	2	1	1	0	1	0	0	5
S. typhimurium	12	54	3	6	1	4	6	4	90
Other	16	14	13	13	1	0	6	37	100
Total	28	103	18	20	2	7	13	43	234

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