

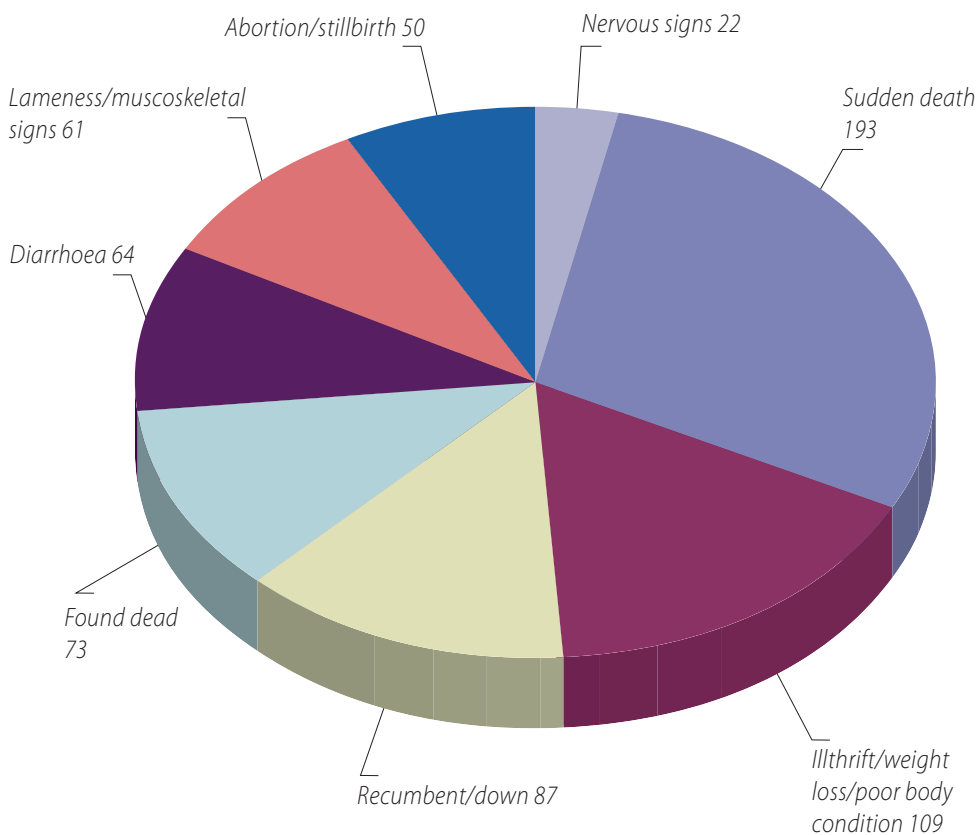
# NEW SOUTH WALES ANIMAL HEALTH SURVEILLANCE

Information contributed by staff of the Livestock Health and Pest Authorities and the Department of Primary Industries

## Disease surveillance in livestock

Official vets from the Livestock Health and Pest Authorities (LHPA) and NSW DPI conducted approximately 600 disease investigations during the

quarter, together with about 200 phone consultations with producers. The pie chart below shows that the signs reported in the animals were potentially signs of notifiable diseases—which are, of course, the business of official veterinary services.



Examples of presenting signs in LHPA and DPI investigations in the July to September quarter this year

## In this issue!

Disease surveillance in livestock	1
Anthrax shows up near Parkes for spring	2
Hendra virus in horses	2
<i>Mannheimia haemolytica</i> pneumonia in beef calves	2
Freshwater crayfish disease	3
A dog tests antibody positive for lyssavirus	3
First dog in NSW to be confirmed Hendra virus positive	5
Forage rape poisonings in the North West	5
<i>Listeria ivanovii</i> abortion in cattle	6
New HT-J test for surveillance of bovine Johne's disease	6

## Anthrax shows up near Parkes for spring

In late August to September 2013 a total of nine beef cattle and five sheep died on a property near Parkes. Anthrax was confirmed at the State Veterinary Diagnostic Laboratory (SVDL) Menangle on 11 September. An immunochromatographic test run by the district vet gave a positive result on 6 September; control measures were then applied immediately. The property was placed in quarantine, all at-risk stock were vaccinated (260 cattle and 2000 sheep), and the carcasses were burned to ash. A search of the NLIS (National Livestock Identification Scheme) database revealed that there had been no movements on or off the property in the 21 days before the first death on August 23 or before confirmation of the diagnosis.

## Hendra virus in horses

Four horses on separate properties were diagnosed with Hendra virus disease during the quarter. All were in the Kempsey–Macksville region of the Mid North Coast of NSW, where there are large numbers of flying foxes. (A dog on one of the properties also tested positive for Hendra virus – see the story later in this issue.)

One horse was found dead, with no signs of ill health observed by the owner, whereas two had been sick for short periods (1 or 2 days) with depression, stumbling, incoordination, recumbency or apparent blindness, and sometimes colic, before death. The latter two horses had had near-normal temperatures of 38.4°C and 38.6°C when examined by a vet. Hendra infection was confirmed on samples submitted to the SVDL at Menangle.

The fourth case, in a 13-year-old quarter horse mare near Kempsey, was not initially suspected of being Hendra virus infection. The mare had been struggling to maintain condition since she had

foaled 10 months previously. After the foal had been weaned the mare showed a change in behaviour, becoming slow and lethargic and reluctant to move. She was treated with penicillin for 1 week.

The mare then began to lie down for periods; she started showing neurological signs and ultimately become entangled in a fence. Examination revealed that she was dull, with an increased heart rate (68 beats a minute), a high temperature, reddened mucous membranes, signs of trauma around the eye, jaundice, teeth clenching and grinding, and mouth ulcers. The horse was euthanased. Samples submitted to SVDL were positive for Hendra virus.

**For further information contact Paul Freeman, Senior Veterinary Officer Wollongbar, on (02) 6626 1214.**

## *Mannheimia haemolytica* pneumonia in beef calves

Pneumonia caused by *Mannheimia haemolytica* and environmental stressors killed about 10% of extensively managed, unweaned beef calves on a drought-affected property near Burren Junction in North West NSW.

The mob comprised 60 yearlings, 48 shorthorn cows and 77 shorthorn heifers in store condition, plus calves up to 8 weeks of age.

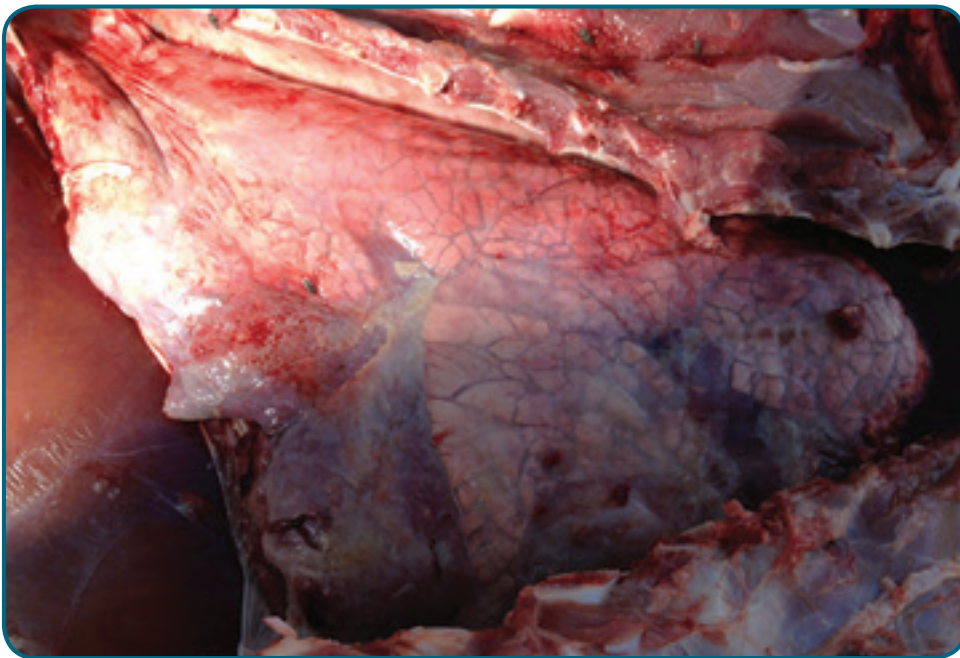
The cattle had been grazing failed winter cereal crops for the previous 6 weeks before being moved in dusty conditions to a 900-hectare failed barley crop.

About 8 days after the move, six calves and one weaner died and the owner notified the district vet, who then examined the herd. Most of the calves appeared active and strong, although one was depressed and had a soft cough and nasal discharge.

Weather conditions over the previous 2 weeks had been unseasonably hot during the day (about 30°C) and cool at



Part of the pneumonia-affected herd grazing near the watering points. Photo L Guest



Chest cavity of a calf with pneumonia. Note the whitish adhesions of fibrin and the liver-like appearance of the lung. Photo L Guest

night (about 10°C), but in the week before the paddock move there had been 3 days of sub-20°C maximums, with night minimums approaching 0°C. There had been no rainfall for more than 2 months.

A post mortem of a 4-week old calf showed that the liver was enlarged; the abomasum was filled with gas and scant, watery contents, including some grass, but no milk. There was a marked pleuritis (inflammation of the lung lining), with extensive adhesions of fibrin (a white

protein material) in the chest cavity. The lower half of the lungs was consolidated (i.e. firm and solid), and when the surface was cut a moist exudate was released.

A profuse, pure growth of the bacterium *Mannheimia haemolytica* was cultured from the lung tissue. The bacteria were sensitive to tetracycline.

In the week following the property visit about 12 calves were treated with oxytetracycline during daily monitoring; sick calves were caught in the paddock to avoid the stress of mustering and

then treated with a dose of long-acting oxytetracycline. A further five calves and one yearling died.

This case is unusual for the North West of NSW in that it occurred in unweaned calves. It is possible that maternal immunity to *M. haemolytica* was compromised because of nutritional stress in the heifer mothers. It is likely that the stress to the calves of mustering and moving paddocks under extremely dusty conditions and following a period of marked weather changes contributed to the outbreak.

**For further information contact Libby Read, District Veterinarian North West LHPA, on (02) 6792 2533.**

### Freshwater crayfish disease

A quarter of the yabbies caught commercially in the Lake Cowal area near West Wyalong were found to have shell damage.

Analysis of the affected yabbies by NSW DPI found the cause to be a type of flatworm (the ectoparasite *Temnocephala* sp.), which is not uncommon and has been reported as a fouling organism in Australian yabbies. It tends to be associated with yabbies that are stressed or are living where the water quality or conditions on the dam bottom are poor, particularly when there is a deficiency of oxygen.

**For further information contact Melissa Walker, Strategy Leader Aquatic Biosecurity, NSW DPI Port Stephens, on (02) 4916 3911.**

### A dog tests antibody positive for lyssavirus

A recent investigation into the disease status of a North Coast dog that caught and ate a low-flying flying fox has highlighted the importance of post-bat-exposure rabies vaccination for pets, even though natural infection of any

dog or cat with Australian bat lyssavirus (ABLV) has not been reported in Australia.

On 15 July 2013, following media reports of Hendra virus infection in NSW horses, an 8-year-old dachshund dog was presented to a North Coast district vet clinic 3 weeks after the owners saw it kill and eat a flying fox. The dog had previously caught low-flying birds. The owners were concerned about the possibility that the dog may have contracted Hendra virus from the flying fox.

The behaviour of the flying fox—flying close to the ground during the day—was assessed as abnormal. It is known that the prevalence of ABLV infection is higher in bats that display neurological signs, including abnormal behaviour. No remains of the bat were available for testing.

Blood samples collected from the dog on 15 July and tested at the Australian Animal Health Laboratory (AAHL) were inconclusive for ABLV: the antibody titre was right on the cutoff of 0.5 IU, and the blood was negative for Hendra virus. On the advice of a NSW DPI veterinarian, the animal was re-sampled on 29 July. The owners were advised to keep the dog confined, restrict contact, and report any behavioural or neurological changes immediately during the wait for the new test results. The second sample showed a modest increase in the antibody level (to 0.66 IU), consistent with a low positive test result.

On the basis of the positive test result the Chief Veterinary Officer concluded that there was a risk the dog had been exposed to infection and that the national policy recommendations in the ABLV AUSVETPLAN manual should be implemented. However, before the results of the second sample became available the owners had already elected to have the dog euthanased; the dog was frozen for later examination.

At post mortem and histological testing at the SVDL there were no significant

findings. Testing at AAHL was also negative; these tests included fluorescent antibody tests for lyssavirus antigen and polymerase chain reaction (PCR) tests for both ABLV and rabies virus.

ABLV is a known zoonotic disease. So far it has caused death in three people, all in Queensland, from direct contact with infected flying foxes. Dogs and cats have previously been reported to have had contact with bats, but until now none has tested antibody positive.

NSW Health and Biosecurity NSW convened an expert panel to assess human exposure risks and provide advice on risk mitigation. Post-exposure rabies vaccination was offered to the family members.

Because lyssaviruses can be sequestered (hidden) and not readily detected until an animal shows clinical signs, the infection status of this dog remained unknown. It is possible the dog had been exposed to infection but had mounted an effective immune response. However, this case reinforces the message that dogs and other animals could become infected with ABLV, particularly after the positive infection tests in two horses in Queensland earlier this year.

Biosecurity NSW strongly recommends that animals that might have been exposed to a bat with suspected or confirmed ABLV infection be vaccinated with rabies vaccine to protect them against ABLV infection. This requires approval from the NSW Chief Veterinary Officer (call an LHPA or NSW DPI vet, or visit the NSW DPI website for a copy of the form). The vaccine should be given as soon as possible after any suspected exposure. The exposed animal should be kept confined until immunity develops; this takes about 21 to 28 days.

**For further information contact  
Therese Wright, Manager Animal  
Biosecurity Services and Response,  
NSW DPI Orange, on (02) 6391 3351.**

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## First dog in NSW to be confirmed Hendra virus positive

A dog on one of the four Mid Coast properties found to have horses infected with Hendra during the July 2013 outbreak in NSW (see 'Hendra virus in horses' above) was confirmed positive for Hendra virus infection. This is the first such report in Australia.

A blood sample from the fox-terrier-cross was positive in a qRT-PCR (real-time quantitative PCR) test 12 days after the horse had died. Although clinically normal, the dog was euthanased according to national policy and submitted for post-mortem examination at the SVDL.

There was evidence of a vasculitis (inflammation of the blood vessels), with fibrinoid necrosis (tissue death with the accumulation of fibrin protein material) in some organs. Viral RNA (ribonucleic acid) was detected in many organs and in the blood: the levels were much higher in some organs (especially the liver, spleen, heart, spinal cord and lymph nodes) than in the blood, suggesting that the virus was actively replicating. A virus neutralisation test was positive (with a titre of 8) on a serum sample taken on day 12; by the time the dog was euthanased 2 days later the level had risen to 128.

On histopathology the dog's cerebral cortex showed mild, diffuse expansion of the meninges (the membranes covering the brain), with scattered lymphocytes and plasma cells. In many areas the meningeal blood vessels were surrounded by dense cuffs of inflammatory cells (lymphocytes and plasma cells) and karyorrhectic debris (debris from the fragmented nuclei of dying cells), with only a few macrophages. There was expansion of many of the Virchow-Robin spaces (the canals around the arteries and veins) in the grey matter of the brain cortex,

with infiltration of inflammatory cells as described above.

Large numbers of blood vessels were obliterated by a uniform material containing eosinophils (a sign of fibrinoid necrosis, i.e. tissue death with the accumulation of fibrin protein material); the blood vessels also showed narrowing of the lumen (the central space through which the blood flows), with loss of the intima (the internal lining layer) and expansion of the media (the middle layer) with inflammatory cells.

The dog had been in the area where a clinically affected Hendra-positive horse was euthanased; blood and other body fluids from the horse had been observed on the ground. This contact history and the test results at day 12 strongly suggest that the dog was infected as a result of this contact and not from some other source.

**For further information contact  
Barbara Moloney, Technical  
Specialist Disease Surveillance,  
Biosecurity Operations, NSW DPI,  
on (02) 6391 3687.**

## Forage rape poisonings in the North West

Sudden deaths in central NSW are always investigated by official vets to exclude anthrax. Plant poisonings are often the cause.

During the winter of 2013 the Warialda LHPA office was contacted by six separate producers about unwell or dead cattle that had been grazing crops of forage rape (*Brassica* sp.).

The clinical signs reported by producers varied from cattle lying down to wandering aimlessly and sometimes dying. In most cases, a presumptive diagnosis of polioencephalomalacia (PEM) was given to the owners on the basis of the reported history and clinical signs.

In a typical case, the district vet did a post mortem on one animal at a property where numerous young stock had been found affected or dead. Superficially the animal appeared normal, but a subsequent histopathology examination of the brain tissue revealed changes that were diagnostic for PEM.



*A weaner affected by polioencephalomalacia (PEM); the crop is forage rape. Photo T Irwin.*

Forage rape is generally considered an excellent alternative winter forage crop for livestock. No toxicity was reported the previous year, despite the crop being grown around the district. Environmental conditions during the growing season play a vital role in the potential of the plant to cause toxicity at any given time.

High levels of sulfur in the *Brassica* sp. plants are associated with PEM; the pathology resembles that found in Vitamin B1 (thiamine) deficiency. It is not known whether there is a direct relationship between high sulfur and PEM or whether there are effects on the rumen flora that then cause thiamine deficiency.

Some of the cattle were given Vitamin B1; although there have been informal reports that this treatment is effective, the treated animals did not recover any faster than the ones that were not treated and simply removed from the crop. Treatment of any sort in severely affected stock was generally unsuccessful.

**For further information contact Ted Irwin, District Veterinarian North West LHPA, on (02) 6729 1528.**

### ***Listeria ivanovii* abortion in cattle**

Two heifers on the Central Tablelands delivered stillborn, near-term calves about a month before the herd was due to start calving. The cattle were grazing improved perennial pastures supplemented with ryegrass silage.

One foetus that was presented for a post-mortem appeared superficially normal. However, a profuse pure growth of the bacterium *Listeria ivanovii* was cultured from both the liver and the contents of the abomasum, confirming that this organism was the likely cause of the abortion. Blood samples taken

from the heifers and three others in the herd ruled out leptospirosis (caused by *Listeria monocytogenes*) or pestivirus as the cause of the abortions.

*Listeria ivanovii* is occasionally encountered as a cause of abortion in ewes, especially if they have been fed silage or have had access to decomposing plant material. However, it is a rare cause of abortions in cattle. *Listeria monocytogenes*, on the other hand, is a relatively common cause of sporadic abortions in cattle.

After she delivered the first foetus, the owner developed a transient pustular dermatitis on her arms. It might have been caused by the *Listeria* bacteria, although *L. ivanovii* is a rare pathogen of humans. On the other hand, *Listeria monocytogenes* has been known to cause pustular dermatitis, particularly in vets delivering calves. The owner recovered from this infection without treatment or a diagnosis.

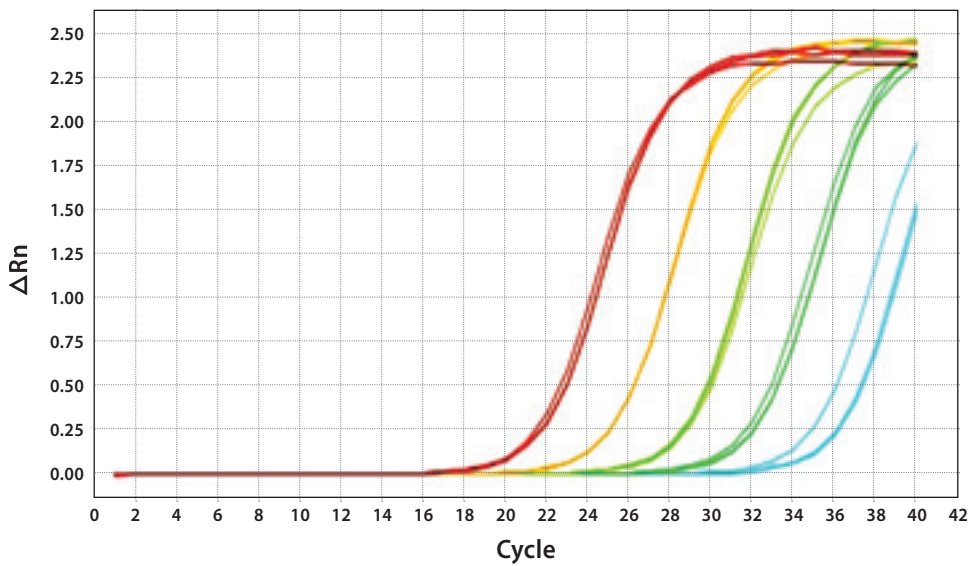
**For further information contact Bruce Watt, Senior District Veterinarian Tablelands LHPA, on (02) 6331 1377.**

### **New HT-J test for surveillance of bovine Johne's disease**

Johne's disease is found in many ruminant species and is caused by *Mycobacterium avium* subsp. *paratuberculosis* (MAP). The gold standard for detection has been culture in conjunction with conventional PCR, but the slow growth of this bacterium means that there is a delay of many months before the results are available.

The University of Sydney (Professor Richard Whittington and Dr Karren Plain) and NSW DPI (Dr Ian Marsh) have developed a new validated herd- or flock- based high-throughput PCR test, called the HT-J test, to detect MAP in the faeces. Results are available only a few days after samples are submitted.

**Amplification Plot**

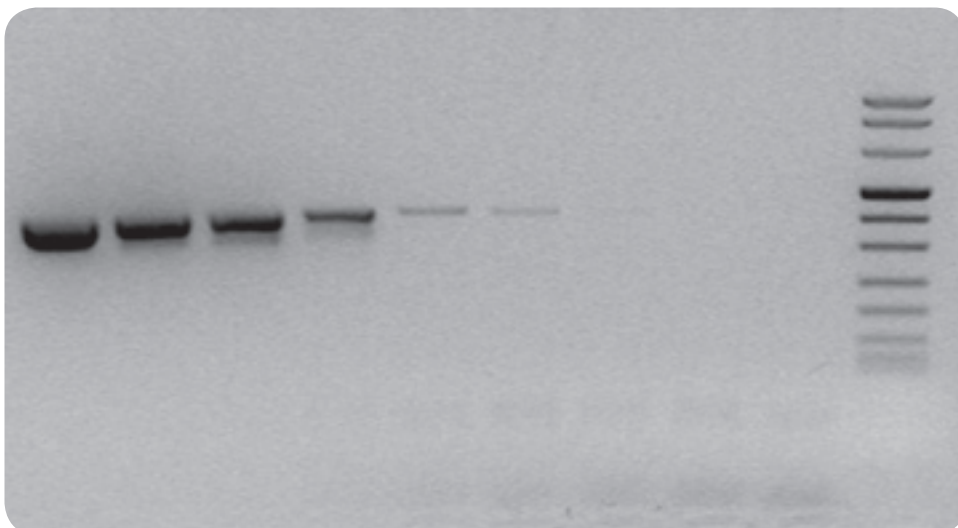


Typical amplification plot generated from the qPCR used to detect DNA originating from MAP (*Mycobacterium avium subsp. paratuberculosis*) in cattle or sheep faeces. Cycle (x axis) indicates the number of rounds or 'cycles' of DNA amplification it takes for the reaction to be considered positive for a range of standards of known MAP DNA concentrations, shown in different colours.

So far in 2013, more than 45 submissions involving 2050 tests have been done at the SDVL.

The new test is a highly sensitive and specific quantitative PCR (qPCR). The results are viewed as computer-generated curves rather than as the traditional agarose gel images used in conventional PCR.

Correct storage of the faeces and transport to the laboratory are critical to the success of the test. Vets should store the samples at 4°C before delivery and keep them on ice while they are in transit to the laboratory. Samples are best sent to the laboratory as soon as possible, avoiding unnecessary delays in transit (e.g. deliver them to the laboratory on



Conventional PCR relies on agarose gel images such as this to detect the DNA originating from MAP in cattle or sheep faeces.



PCR-based strain typing for MAP. Lanes 1, 2 and 3 are bison, cattle and sheep, respectively.

weekdays to avoid storage at a courier depot over the weekend). Upon arrival at the laboratory the faeces are stored at -80°C until the HT-J test is done.

At the herd or flock level the sensitivity of the HT-J test appears to be greater than that of faecal culture in that it detects more animals from infected herds or flocks.

However, neither the HT-J test nor culture will detect all infected cattle. Both tests may detect overlapping subsets of infected cattle in a herd. As both tests work best at the herd level, the sample size needs to be chosen to suit the level of assurance required.

The HT-J test was used extensively in the Queensland surveillance program following the confirmation of Johne's disease in that state. Furthermore, conventional strain-typing of cultures submitted to the Elizabeth Macarthur Agricultural Institute from Queensland revealed that the strain responsible for Johne's disease in Queensland was the bison strain.

**For further information contact  
Dr Ian Marsh, Research Officer,  
NSW DPI, on (02) 4640 6502.**

## Getting information on animal diseases

This surveillance report can convey only a very limited amount of information about the occurrence and distribution of livestock diseases in New South Wales. If you would like more specific information about diseases occurring in your part of the state, contact your local Livestock Health and Pest Authorities District Veterinarian or Departmental Regional Veterinary Officer.

**For statewide information, contact the Department of Primary Industries Animal and Plant Biosecurity Branch in Orange on (02) 6391 3237 or fax (02) 6361 9976.**

For more information on national disease status, check the National Animal Health Information System (NAHIS) via the internet at:  
<http://www.animalhealthaustralia.com.au/status/nahis.cfm>

This is a report under the Animal Disease Surveillance Operational Plan, Project 8, 'Reporting for Animal Disease Status in NSW'.

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**Copies of NSW Animal Health Surveillance reports are available on the internet at:  
<http://www.dpi.nsw.gov.au/newsletters/animal-health-surveillance>**

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The information contained in this publication is based on knowledge and understanding at the time of writing (October 2013). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up-to-date and to check the currency of the information with the appropriate officer of Department of Primary Industries or the user's independent adviser.

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LIVESTOCK HEALTH AND PEST AUTHORITIES

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