Information contributed by staff of
NSW Department of Primary Industries
and Local Land Services

NEW SOUTH WALES

ANIMAL HEALTH SURVEILLANCE

April–June 2014 » Issue 2014/2

IN THIS ISSUE

Two cases of foot-and-mouth disease exclusion in cattle

Foot-and-mouth disease (FMD) has been investigated and excluded on two properties in NSW in the last 2 months.

The case on the first property involved two water buffalo and three calves at a wildlife park north of Sydney. A private vet initially went to this property to look at a sick adult water buffalo. He found mouth ulcers and erosions around the dental pad, lips and tongue. The animal had blood-tinged froth and saliva around the mouth and pustules on the chin. No foot lesions were identified. Follow-up investigation revealed that, within days, similar oral lesions had developed in four calves at the property.

The private vet contacted DPI about the findings and an experienced vet from LLS then ran further investigations. Blood samples and swabs of the ulcers were sent to EMAI for PCR testing for FMD, which was negative. Samples forwarded to the Australian Animal Health Laboratory (AAHL) at Geelong were negative for both FMD and vesicular stomatitis virus. A presumptive diagnosis of bovine papular stomatitis virus infection was made on clinical grounds.

An initial concern in this case was that the property housed eight different FMD-susceptible species (including cattle, goats, sheep and alpacas). Being in a wildlife park open to the public, the animals were exposed to close contact with tens of thousands of visitors each year. The risk that a visitor carrying the FMD virus had transmitted infection could not be dismissed.

Using a newly developed tracing program that interrogates the National Livestock Identification System (NLIS) database, in less than 3 hours DPI had traced movements of stock from the property to identify the potential for spread had this been a case of FMD. The tracing team assumed that the lesions were 7 days old, and they used an incubation period of 14 days to define when the infection may have first happened. The NLIS database showed that during this 21-day period the affected property had sent stock to saleyards on two occasions. As a result of contact with other susceptible stock at the saleyards, and as a result of the contact *those animals* had had with other susceptible stock after they had left the saleyard, there were 449 properties that required surveillance to determine their disease status.

Oral lesions of suspected bovine papular stomatitis. Photo D Rayward

The second FMD exclusion involved a bull and a mob of Angus heifers in the Central West of NSW that had oral lesions. The bull was noted by the owner to be drooling excessively and had lost weight over the preceding 2 weeks. The bull was joined with a mob of 58 Angus heifers, and soon after the owners noted that 18 of these heifers had begun drooling and coughing. The heifers had previously shared a water source with the bull for a month.

An investigation was done by the regional LLS vet. The bull was lying down upright, and there was a small pool of saliva on the ground in front of him. He was light in condition and had a slight swelling under the jaw (but no fever). He had two 2-millimetre-diameter healed ulcers, one on the tip of the tongue and one on the dental pad. He had a large 80-millimetre ulcer on the top of the tongue. There were no lesions detected on the feet, although the space between the hooves could not be examined.

Four heifers were individually examined. None had a temperature. All the heifers had ulcers on the gum below the incisors, varying in size from 5 to 10 millimetres. They also had ulcers on the tongue that were approximately 15 millimetres in diameter. Grass seed debris was found in one of the lesions.

At least one foot of each heifer was examined, but no foot lesions were seen.

To exclude FMD, blood samples and swabs and epithelium from the oral lesions were collected in phosphate-buffered saline and sent to EMAI and AAHL, where they tested negative.

A pasture assessment revealed spear grass and another unidentified grass with larger 'spear-grass-like' seeds in the paddocks. A presumptive diagnosis of mechanical irritation to the mouth was made to explain the oral lesions.

For further information contact Geoff Campbell, Veterinary Officer, DPI Orange, on 6391 3534, or Belinda Edmonstone, District Veterinarian, Central West LLS, on 02 6852 1688.

Ulcer below incisors in a heifer: possible grass seed trauma. Photo B Edmonstone

Bovine Johne's disease (BJD) in a beef cow

A private vet investigated acute weight loss in a 6-year-old Santa Gertrudis cow 3 weeks after it had calved on a beef property in a non-dairying area (central NSW).

The cow had severe liquid diarrhoea. A screening blood test using the BJD ELISA showed that it had a high level of antibodies to bovine Johne's disease. The private vet reported the suspect case of BJD to the official veterinary services of the NSW Department of Primary Industries (DPI) and Local Land Services (LLS).

The District Vet euthanased the cow and did a post-mortem examination. Histopathological examination at EMAI (Elizabeth Macarthur Agricultural Institute) revealed the typical acid-fast bacteria in cells in the intestine. Later, the bacteriologist cultured the cattle strain of *Mycobacterium avium* ssp. *paratuberculosis*.

The affected cow had been bought about 4 years previously, along with 13 other cattle. When these were tested, two more cows were positive on faecal culture for *M. avium* ssp. *paratuberculosis*

The affected cows were more than 12 months old when they arrived on the affected property. The District Vet concluded that they were already infected when they arrived, and that the cattle on the property of origin therefore needed to be investigated. The District Vet in the area where the cattle had come from took blood samples from all cattle eligible for testing (i.e. those at least 2 years old); five out of 146 were serologically positive. Samples were also collected for laboratory examination and culture. At the time of writing, testing on these samples had not been completed.

Scouring, wasting and oedema (bottle jaw) in a bull with BJD. Photo M Ball

For further information contact Graham Bailey, Senior Veterinary Officer, DPI Orange, on (02) 6391 3455.

Background to the bovine Johne's disease program in beef cattle

Official control of BJD in dairy cattle in NSW has been largely replaced by industry-led control, but it remains in place for beef cattle properties. NSW is a *beef protected area* because BJD is present at low prevalence in this state in beef cattle.

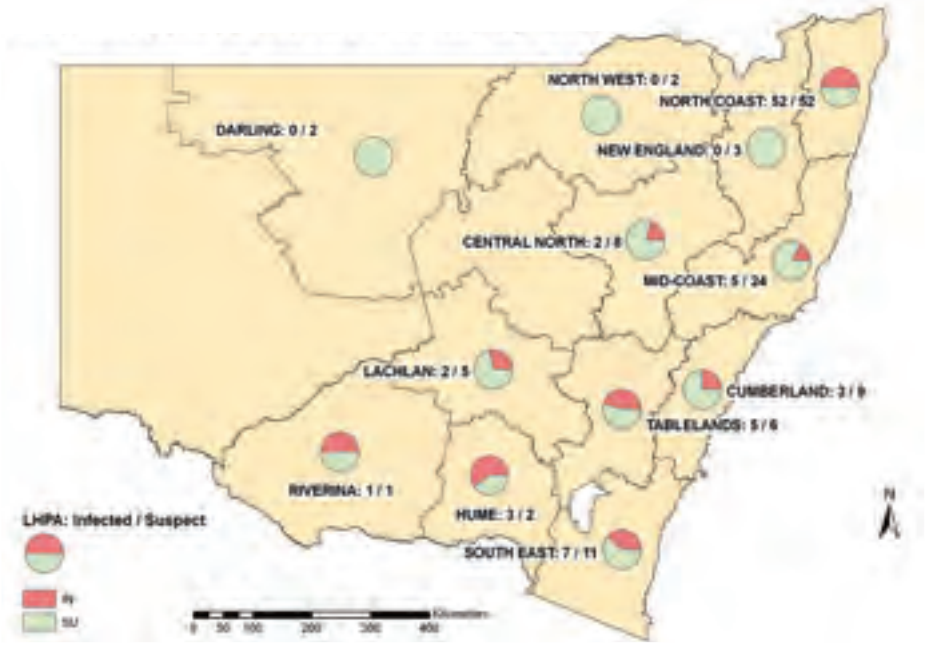
The Cattle Council of Australia has offered the National BJD Financial and Non-financial Assistance Package (FNF) to affected beef producers for the last 9.5 years. By the end of December 2013, two hundred and four herds had enrolled in the program. In addition, one herd had been detected as being infected with BJD, but the owner had chosen not to enrol the herd in the program. The map on this page shows the locations of these 205 beef herds within the former Livestock Health and Pest Authority (LHPA) regions. The North Coast LHPA and the Mid Coast LHPA accounted for 65% of the cases.

Among all of the herds, 80 were allocated an *infected* status on entry to the program, i.e. at least one animal had tested positive for BJD. Most of the infected beef herds were located in dairying areas; BJD infection in dairy cattle appears to have occasionally 'spilled over' into these beef herds through various forms of contact. Ten out of 80 cases (13%) were located on land recently used for dairying.

Twenty-four out of the 80 herds had been diagnosed positive for BJD before the start of the FNF program. Therefore, 56 out of approximately 70,000 beef herds in NSW were detected as BJD positive in the 9.5 years since the program began. This supports the need to maintain an official control program, although the real prevalence of BJD in beef cattle all around Australia remains unclear and still needs to be scientifically reviewed.

Most of the infected beef herds (73%) were detected because they contained cattle that showed clinical signs. Three herds were detected as *infected* following positive ELISA blood tests as part of the BJD Market Assurance Program. The remaining 12 detections either resulted from the testing of traced animals or were not explained.

The remaining herds (125 of 205) were allocated a *suspect* status on entry to the program because they had received or supplied potentially BJD-infected cattle. Traces of cattle that go directly to abattoirs (or indirectly via feedlots) are not pursued. When infection is detected on cattle studs there are many traces, as illustrated in the flow diagram on the next page. In the example in the diagram, two trace-forward herds were allocated an *infected* status as a result of the testing of traced cattle.



Suspect and infected beef properties within each of the former LHPA regions in NSW. Based on historical data before the formation of Local Land Services.

When BJD is confirmed in cattle born on a property and there is no clear indication as to the date of introduction, the District Vet traces all the cattle from the property for the previous 7 years. On properties with confirmed traces, the District Vet imposes movement controls on store cattle from the property (while still allowing turnoff to abattoirs and approved feedlots).

To resolve the suspect status under a Property Disease Management Plan (PDMP), *where all traced animals are available for testing* the owner may:

- slaughter the traced cattle and take samples for histopathology testing and bacteriological culture of the intestines and lymph nodes, or
- take two faecal cultures 3 to 6 months apart; the animal or animals must be sold from the farm shortly after the second sample is taken.

The rationale is that if the cattle test negative and are removed there has been no opportunity to transmit BJD to the other cattle on the property. If the tests are negative the status is resolved.

If *one or more animals are not available for testing*, resolution is more complicated. The strategy is to test the 'age-susceptible animals' that the traced animals have had contact with. This will determine whether spread has occurred if, indeed, the missing cattle were infected.

Cattle are susceptible to infection during the first 12 months of life. Therefore, cattle that were younger than 12 months when they were co-grazed with the traced animals are tested with a screening ELISA blood test when they reach an appropriate age (see below). Also, *M. avium* ssp. *paratuberculosis* can persist for up to 12 months in the soil after infected cattle are removed. For this reason, any cattle that grazed potentially

contaminated soil when they were less than 12 months old are also tested.

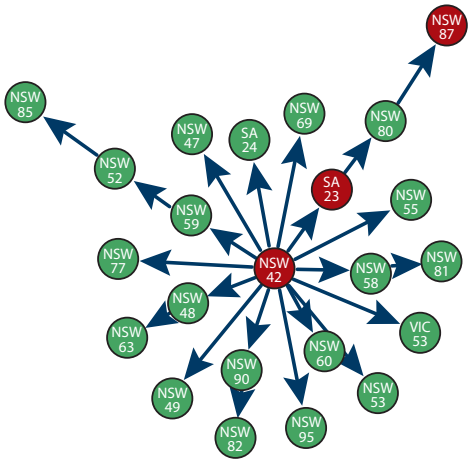
The BJD ELISA test has very low sensitivity when applied to animals less than 2 years old. Age-susceptible animals therefore have to be older than 24 months to be eligible for testing. The older the cattle are after exposure, the greater the assurance that negative tests are valid.

In situations where BJD is diagnosed in an animal introduced when older than 12 months (see 'Bovine Johne's disease in a beef cow' on page 3), 'trace backwards' is done. This is because cattle older than 12 months are relatively resistant to infection. Thus, they were most likely infected on the property of birth, rather than the property on which they were detected positive.

On trace-back properties, the District Vet generally conducts a whole-herd BJD ELISA test of eligible cattle (older than 24 months) followed by definitive testing of animals that test positive.

For District Vets, the development of PDMPs and the tracing and testing of cattle constitute a large amount of work, particularly if large numbers of traces are involved. The tracing skills developed by District Vets dealing with endemic diseases such as BJD equip them to deal with potential future outbreaks of highly infectious exotic diseases such as foot and mouth disease. In such events, prompt tracing in the initial stages of the response is critical to limiting the impact of the outbreak.

For further information contact Graham Bailey, Senior Veterinary Officer, DPI, Orange, on (02) 6391 3455.



Example of a diagram of tracing from one herd, showing the large numbers of trace-forward animals. Red circles: infected herds; green circles, suspect herds; blue lines, trace-forward herds. Arrowheads show the direction of trace.

Respiratory diseases causing death in grass-fed steers

On two properties in the Yass district, weaner cattle recently purchased from the calf sales suffered major respiratory disease this autumn. The first property had purchased four lots of Angus steers, to make a mob of 120. The second landowners had added one lot of 30 Hereford steers to their own calves during yard weaning to make a mob of 90. On both properties water and feed quality was excellent and the weather conditions were mild. The steers were grazing in large paddocks of improved pasture.

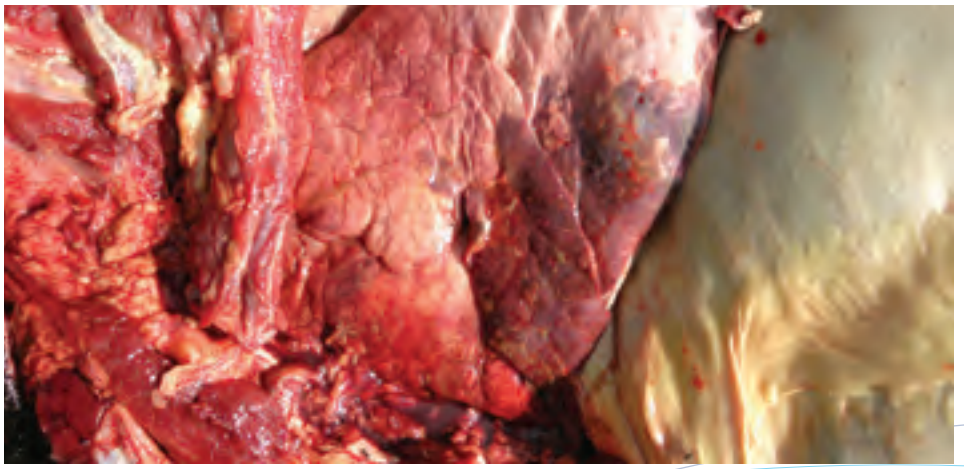
The District Vet was called to both properties after they had each lost two steers in the previous weeks; one farm now had a third dead and more showing marked depression and dehydration. Clinically, those affected had an elevated temperature (between 40°C and 41°C), rapid respiration and heart rate, a silent rumen and an occasional soft cough. Some had lameness, were drooling, or had minor nasal discharge.

On the first property, necropsy showed consolidation of the lower half of the lung, with obvious thickening between the lobules, and abscesses. There was also fibrinous thickening of the pericardium (the sac around the heart) and pleura. Culture of the lung gave a profuse growth of *Mannheimia haemolytica* bacteria. On the second property, profuse pleural fluid and a thick gelatinous pleuritis (inflammation of the lining of the lungs) was observed. The lung changes were more generalised in this case, but interlobular thickening was again noted. *Histophilus somni* bacteria were isolated from a culture of the lung and the pleural fluid.

Occasionally only one infectious agent is involved in bovine respiratory disease, but more commonly obvious disease results from bacterial infection that is secondary to viral infection. On both properties two of the mob were tested for underlying infectious viral agents.

The results showed that on the first property one of the affected steers was a persistent carrier of pestivirus, thus infecting the others, and serology results also showed that parainfluenza

continued on page 6



Pleuropneumonia. The bacterium *Mannheimia haemolytica* was isolated. Photo A Stephens

Fibrinous and purulent pleurisy (inflammation of the lining of the lung) caused by *Histophilus somni* bacteria. Photo A Stephens

continued from page 5

type 3 virus was also circulating. A foot swab showed that the lameness was caused by footrot; an unstable isolate of *Dichelobacter nodosus* was isolated. This property lost four of the 120 steers, and 12 required treatment with oxytetracycline for both respiratory disease and painful footrot lesions. Losses stopped shortly after the initial treatment.

On the second property BRSV (bovine respiratory syncytial virus) was found to be circulating with the *H. somni*. The combination of these two organisms resulted in a 3-week outbreak of disease on the property, requiring intensive management to prevent losses. The steers were observed daily for signs of depression and were pulled out of the paddock for antibiotic and anti-inflammatory treatment as required. If the animals had not been treated, their clinical signs of illness would have progressed to death within 24 to 48 hours. A total of 17 of the 90 steers required antibiotic treatment, and four steers died from the disease. Testing for contagious bovine pleuropneumonia was negative.

Bovine respiratory disease results from a combination of stress and infectious agents. These young cattle were presumably stressed by the process of weaning, consignment to large weaner sales, being mixed in with other mobs, and then trucked again.

For further information contact Alexandra Stephens, District Veterinarian, South East Local Lands Services, Yass, on (02) 6226 1155.

Presumed false blackleg (malignant oedema) in Angus weaners

Blackleg disease of cattle is typically caused by the bacterium *Clostridium chauvoei*. In this case, despite the clinical and post-mortem picture being typical of blackleg, the cause was suspected to be *Clostridium septicum*, which normally causes the condition 'malignant oedema' when wounds are infected in susceptible stock.

Calves on a property near Bathurst had been weaned in a yard over a 2-week period in early April. On 9 April, following harassment by dogs, the calves escaped from the yards, destroying them in the process.

About a month later, seven of the 78 mixed-sex Angus weaners were found dead in a paddock of improved pasture. The owner called the District Vet, who euthanased a well-grown, lame, 200-kg weaner steer that was depressed and feverish. The vet then did a necropsy.

After the steer had been euthanased a small amount of bloody fluid oozed from the nose and anus. Removal of the skin revealed an extensive area of wet, red, gas-distended subcutaneous tissue and muscle over the back and rump.

Inflamed and emphysematous (gas-distended) hind leg muscles. Photo B Watt

Although the clinical signs, gross findings and histopathology supported a diagnosis of blackleg, only *C. septicum* was detected on fluorescent antibody testing of the muscle samples. Thus, the diagnosis was false ('pseudo') blackleg.

C. septicum can cause disease that resembles blackleg, or it may occur in mixed infections with *C. chauvoei*.

The calves had received one dose of clostridial vaccine at marking, but none subsequently. A single dose at marking is not effective. It takes about 10 days for stock to develop immunity to the clostridial diseases after vaccination, and immunity is short-lived unless a booster is given. The calves were immediately vaccinated against the clostridial diseases, and after 2 days no more deaths occurred.

For further information contact Bruce Watt, Manager Biosecurity and Emergency Services, Central Tablelands LLS, on (02) 6331 1377.

Blue-green algae poisoning north of Moree

Five deaths were discovered in a small 120-hectare paddock holding about 25 Wagyu cows, steers and heifers on a property 70 kilometres north of Moree. The property was surrounded by cropping country, and the paddock in question had only sparse shade. All five dead stock were juveniles about 12 months old. Three of them were found dead around a small dam, and the other two died along a fence line. The dam surrounds also contained the only two trees in the paddock.

Anthrax was excluded by testing in the field with an immunochromatography kit, and a post mortem of one dead heifer was conducted. It revealed a grossly enlarged liver (three times the normal size), and the carcase was noticeably jaundiced. The rumen contained a significant amount of pink netting from round-bale wrapping and also some cloth material of unknown origin. The paddock contained two old silos that had rusted out, and some of the contents (consisting mainly of dirt and gravel) had spilled out over the ground. There was a greater than normal amount of grit in the reticulum at post mortem.

Differential diagnoses for this case included anthrax, anaemia due to *Theileria*, anorexia from obstruction and subsequent fatty liver syndrome, acute hepatopathy from toxic plants, and blue-green algae poisoning. There was significant growth of Noogoora burr around the dam, but no other weeds were noted. On the initial visit the dam was observed, but not closely, and no blue-green or other algae were noted. On the return visit the dam was inspected more closely: on the downwind side there were abundant algal blooms similar to those caused by blue-green algae. It looked as though green paint had been put into the dam water. The post mortem signs were also consistent with blue-green algae poisoning.

Blue-green algae in a dam. Photo T Irwin

Lab tests confirmed the presence of blue-green algae, but only in sparse amounts.

It was concluded that blue-green algae was the cause of death in this instance and that the heifer had ingested the foreign bodies (hay netting and cloth) because of secondary pica (i.e. the need to eat abnormal substances). The client was advised to treat the dam for algae or prevent stock from gaining access to it.

For further information contact Ted Irwin, District Veterinarian, North West Local Lands Services, Warialda, on (02) 6729 1528.

Australian bat lyssavirus reporting, January to June 2014

During the last 6 months, four bats have tested positive for Australian bat lyssavirus (ABLV) from 39 laboratory submissions in NSW. Three out of the four cases involved a human being bitten or scratched and requiring medical treatment. Two of the people had already been vaccinated against rabies and regularly handled bats, but they still required post-exposure treatment. The third person was not vaccinated and required a combination of the rabies vaccine and HRIG (human rabies immunoglobulin) treatment.

The 39 laboratory submissions consisted of samples from 37 bats, 1 dog and 1 horse. None of the ABLV-positive bats had had contact with a dog or cat.

The four positive bats came from a diverse geographical area that included the Hunter, Sydney and Riverina regions. The positive bats from the coastal region were all grey-headed flying foxes, and the inland bat was a little red flying fox. Two of the bats were male; the sex of the other two was not recorded. Three of the positive bats had shown abnormal behaviour before death.

Laboratory testing showed that the four positive bats were positive for the Pteropid strain of ABLV; they were positive on FAT (fluorescent antibody testing) and on polymerase chain reaction (PCR) testing of brain tissue. However, only two were positive on mouth swab and salivary gland PCR. This confirms that brain tissue is essential for the diagnosis of ABLV, and that salivary and mouth swabs can give false negative results.

These results support the wide geographical distribution of bats and the likelihood that ABLV will be found in sick bats—especially those with neurological signs. It also reinforces the message that only vaccinated people should handle bats, and even they should seek medical attention if scratched or bitten.

For further information contact Sarah Britton, Veterinary Officer, DPI, Orange, on (02) 6391 3717.

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.

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.

If you would like more specific information about diseases occurring in your part of the state, contact your Local Land Services District Veterinarian or the Department of Primary Industries Senior Veterinary Officer for your region, or go to *www.lls.nsw.gov.au*

For more information on national disease status, check the National Animal Health Information System (NAHIS) via the internet at: *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'.

Content Co-ordinator:
Rory Arthur, Animal and Plant Biosecurity Branch, Department of Primary Industries, Kite Street, Orange 2800.
T: (02) 6391 3608
E: rory.arthur@dpi.nsw.gov.au

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

Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing (July 2014). 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.

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product name does not imply endorsement by the Department of Primary Industries over any equivalent product from another manufacturer.

Information contributed by staff of NSW Department of Primary Industries and Local Land Services

www.dpi.nsw.gov.au
www.lls.nsw.gov.au

JN 13030 07–14