NSW GOVERNMENT

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

NEW SOUTH WALES

ANIMAL HEALTH SURVEILLANCE

January – March 2018 » Issue 2018/1

In this issue

Major rapid deaths from botulism in a dairy herd

In early January a South Coast dairy farmer sought veterinary help after overnight finding six recumbent milking cows in his pasture-based 450-cow dairy. One of the animals was dead when the vet arrived, and at post mortem the gross findings were unremarkable. All the affected cows had been fed maize and grass silage using a mix-all. Possible diagnoses included botulism, metabolic disorders and unknown toxicities.

Blood samples were collected from the recumbent cows. Their calcium and magnesium levels were normal. Moderate elevations in their enzyme levels revealed muscle damage, but this was expected because of their prolonged lying down.

Additional cases appeared daily, and by 3 days later the number dead had increased to 10, with 20 recumbent. By 7 days there were 80 dead cows and 150 recumbent. By the end of the outbreak 275 cows had died or had been euthanased on welfare grounds.

The clinical presentations of the cows were similar. Affected animals had normal temperatures and were found lying on their sternums or their sides. Those lying in their sides often had difficulty breathing. Some animals lying on their sternums were in a 'frog leg' position, with their hindlegs extended to make breathing easier. Tongue paralysis was not noted during clinical examination of the sick cows. At the start of the outbreak the duration of the illness was only 1 or 2 days before each animal died, but later in the outbreak some animals could be lifted and could walk short distances before they lay down again.

Case management was challenging, as the outbreak occurred when summer temperatures were frequently over 30 °C. Clinical cases were triaged by the vet, and a range of symptomatic therapies were tried (fluids and toxin adsorbents). None of the affected animals recovered, and the final death occurred almost 30 days after the outbreak started.

In all, eight animals were necropsied, and they had similar non-specific findings on gross pathology. Clinical pathology testing showed tissue damage, but the metabolic indicators were normal. Multiple samples were tested for the presence of botulinum toxin, and eventually the intestinal contents from one cow were positive for botulinum toxin Type D.

Carcass disposal was a challenge in this outbreak. Initially carcasses were buried on the farm by the farm managers, but the nature of the soil profile and watertable meant that environmental contamination was probable. The carcasses were therefore moved by truck to a nearby landfill and buried under government supervision.

This outbreak resulted in significant emotional stress, and considerable efforts were made to ensure that support services were available to help everyone involved in the response.

Major mortalities from botulism are not infrequent and have high economic consequences. The direct value of the dairy cows lost was over $500,000. Other costs for the owner were labour and feed and the loss of milk income. The response costs were shared between the owner and government agencies. It is likely that the total cost of the outbreak when all costs are included, including return to business, would have been between $750,000 and $1 million. This case highlights the importance of vaccinating against botulism when feeding silage.

For further information contact Paul Freeman, Senior Veterinary Officer, NSW DPI, Wollongbar, on (02) 6626 1214 or Kate Sawford, District Veterinarian, South East Local Land Services, Braidwood, on (02) 4842 2594.

Investigations of potential notifiable diseases, January to March 2018

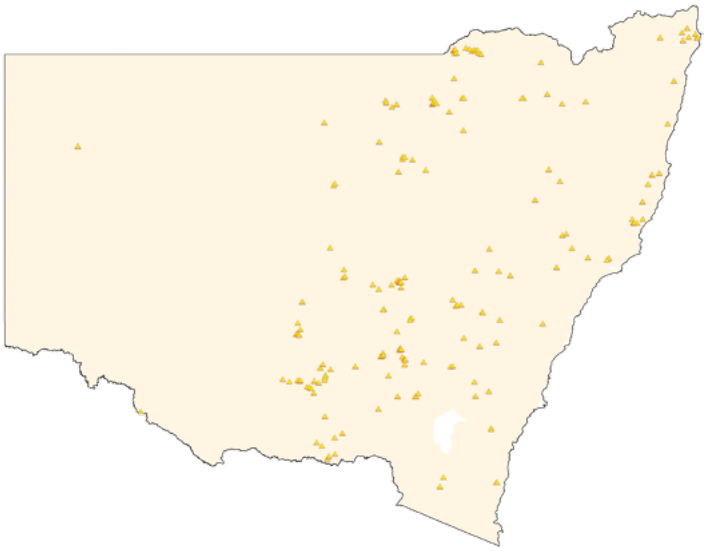
District vets must investigate owner reports of incidents that are classified as potentially 'notifiable'; this is a disease category listed in legislation. Notifiable diseases are usually the ones that can affect market access by all producers, not just the owner of an affected property. Investigations are a priority where there is:

- sudden or lingering death (e.g. to confirm or exclude anthrax, bluetongue, avian influenza or Newcastle disease)
- lameness (e.g. to confirm or exclude footrot or foot-and-mouth disease)
- nervous signs (e.g. to confirm or exclude mad cow disease, lead poisoning, Aujeszky's disease or tick fevers)
- scouring and wasting (e.g. to exclude Johne's disease)
- abortions and infertility (e.g. to exclude brucellosis, trichomoniasis, equine herpesvirus, chlamydiosis or enzootic abortion).

Historical records indicate that there are about 3000 potential cases of notifiable disease each year in NSW (not counting potential Hendra virus cases, which number up to 800 per year). Dry weather during the first quarter of 2018 resulted in fewer investigations than normal because of reduced disease pressure from toxic plants.

The map below shows the locations of disease investigations conducted by district vets in the past quarter.

For further information contact Rory Arthur, Manager Animal Disease Surveillance, NSW DPI, Orange, on (02) 6391 3608.



Investigations by district vets of potentially notifiable diseases, January to March 2018

Anthrax and salmonella excluded in poison peach deaths

In January, two Jersey cows out of 26 on a commune near Nimbin on the North Coast died over a period of 2 days. The commune has had milkers for many years. They are rotationally grazed about every second day on paddocks that interface with rainforest.

Both cows had very similar clinical signs. The first sign was a dramatic drop in milk production, then bloat, kicking at the flanks, then lying down, muscle tremor, low temperature, rapid heart rate and death in a few hours. Examination of the cow that had died late the previous evening revealed blood coming from the anus, and blood taken from a vein didn't clot. An anthrax immunochromatographic test (ICT) on a blood sample was negative.

There were scattered pinpoint haemorrhages over the muscles of the head, neck and front of the thorax. The right and left epicardium and left endocardium at the base of the chordae tendineae ('strings' inside the heart that are attached to the valves) had marked pinpoint and large-spot haemorrhages.

There was mild generalised lymph node enlargement. Both lungs and the spleen were normal. The liver had mild congestion around the portal vein system. The gall bladder was normal in size, but the bile was thick and dark and the mucosa reddened and haemorrhagic. The renal pelvis was dilated, but no crystals were seen with a magnifying lens. Urinalysis was normal.

The rumen appeared to contain only grass. The omasum was large, with a firm, dry content, but not impacted, and the abomasum and its contents were normal.

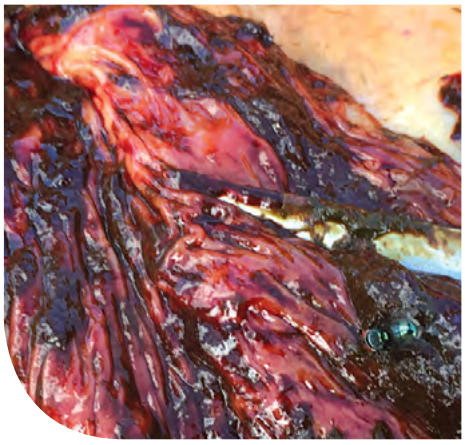
The ileum and spiral colon had marked congestion and frank haemorrhage. The Peyer's patches in the intestine were enlarged, with haemorrhagic foci. The mesenteric lymph nodes were about twice normal size.

Inspection of the paddocks grazed by the cattle in the previous 2 days found no obviously toxic plants and no access to bracken fern, green cestrum or poison peach. The pasture was mixed paspalum, broad-leaved paspalum and *Setaria*.

A brochure on toxic plant identification was left with the owner. He later found that a large native poison peach tree, *Trema tomentosa*, had fallen over the fence into the paddock that the cattle had been in 4 days before the vet had visited. There was evidence that the leaves had been eaten.

Laboratory testing of the aqueous humour of the eye of one of the dead cows revealed a calcium level of 1.45 (normal 2.90 to 3.20). The intestinal contents were negative for *Salmonella* culture. Histopathology examination confirmed that there was marked acute centrilobular and midzonal liver necrosis, locally extensive haemorrhage in the gall bladder wall, and subepicardial, myocardial and serosal haemorrhage. These findings, together with the haemorrhage into the intestine, are typical of acute *Trema* toxicity.

Poison peach is a small native pioneer rainforest tree. Toxicity is not uncommon on the Far North Coast when grazing land and rainforest are next to each other. Cases are associated with recently introduced stock or unaccustomed access. Cases have been found in goats, cattle, sheep and deer in the region.



Haemorrhage into the intestine after poison peach ingestion. Photo P Kemsley

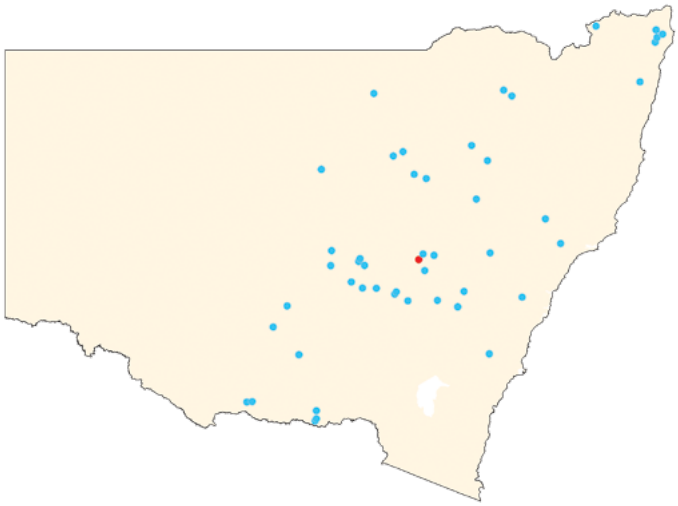
Poison peach. Photo P. Kemsley

For further information, contact Phillip Kemsley, District Veterinarian, North Coast Local Land Services, Lismore, on (02) 6623 3905.

Approximate locations of anthrax investigations

Anthrax infections are of high priority for surveillance by district vets, who respond quickly to reports by owners of sudden death in sheep and cattle. This happens more often than most people think. The map at right shows roughly where all the sudden death cases that might have been anthrax occurred in the period 1 January to 31 March this year. Only one of the cases (the red dot) was positive (see the story on the next page). Failing to diagnose cases of anthrax can have serious trade and market-access repercussions.

For further information contact Rory Arthur, Manager Animal Disease Surveillance, NSW DPI, Orange, on (02) 6391 3608.



Approximate locations of anthrax investigations, January to March 2018. Blue dots are locations of anthrax-negative cases. Red dot shows the location of the single anthrax-positive case in the quarter.

Anthrax near Cumnock

There was one anthrax incident during the quarter. The affected property was near Cumnock, which is in the anthrax endemic area. Four out of 125 cows and calves died over a 2-week period; the early deaths were initially thought to be due to consumption of mouldy silage. An anthrax ICT was positive on the animal examined, and anthrax was confirmed at the State Veterinary Diagnostic Laboratory by polychrome methylene blue staining.

The incident was managed in accordance with the NSW DPI Anthrax policy. The carcasses were burned, and decontamination protocols were implemented. The property was placed under quarantine and all at-risk stock (the remainder of the 125 cattle) and 1000 ewes and lambs were vaccinated. An additional 200 head of cattle on a neighbouring property were also vaccinated. Seven further deaths occurred after the vaccinations. One dead cow that was tested was ICT negative. Tracing identified a small number of lamb mobs that had been moved to other properties in the district. The new owners were notified to closely monitor these animals for 21 days. No stock have been moved to slaughter.

Anthrax was confirmed on the affected property in March 2016. The most recent previous anthrax incident in NSW was in February 2017.

During the quarter there were 49 investigations in which anthrax was excluded as the cause of death. Of these:

- 31 involved cattle, in which the alternative diagnoses included clostridial infection, water deprivation, lactic acidosis, *Mannheimia* pneumonia, and various toxicities from *Phalaris* spp., *Sorgum* spp., *Trema tomentosa* (poison peach), and *Pteridium esculentum* (bracken fern).
- 15 involved sheep, in which the alternative diagnoses included pneumonia, lactic acidosis, ketosis, trauma, and toxicities due to unidentified plants or *Cynodon* spp.
- 2 involved pigs, in which the alternative diagnosis of one case was identified as porcine circovirus type 2 enteritis.
- 1 involved a camel; no alternative diagnosis was identified.

The anthrax ICT was used in 36 of these 49 exclusions, with negative results. In the other 13 investigations, anthrax was excluded by laboratory testing or on clinical grounds on the basis of the alternative diagnoses.

For further information contact Barbara Moloney, Technical Specialist Epidemiology, NSW DPI, Orange, on (02) 6391 3687.

Poisoning of lambs on Bambatsi panic pasture

In March, a Local Land Services district vet investigated the deaths of 90 of 1400 Dorper lambs in the Wee Waa district. The deaths occurred after the lambs were introduced to mature pasture dominated by Bambatsi panic. The lambs showed clinical signs and gross pathology consistent with saponin toxicity. Histopathology was also consistent with saponin poisoning, but the characteristic crystals were not found (potentially because of slight deterioration of the samples). Although the pasture was mature, it was likely that the lambs had preferentially grazed new shoots after recent rain.

Deaths were first noticed 10 days after the lambs' introduction to the pasture; the degree of carcass decomposition suggested that the deaths had started a few days after introduction. Initially 24 dead lambs were found. Three days later, 50 lambs had died and another 80 to 90 were clinically affected. At 10 days, 90 lambs were dead and 30 were clinically affected. All lambs that were dead or clinically affected at 10 days had been in the initially clinically affected group. No ewes were observed with clinical signs. Clinically affected lambs showed lethargy, shade seeking and yellowing of mucous membranes. Photosensitisation was not a prominent feature. On gross pathological examination there was extensive yellowing of all tissues and a swollen, orange liver.

Both pastures had been sown 12 months previously with a Bambatsi panic (*Panicum coloratum* var. *makarikariense*), Gatton panic (*Panicum maximum*) and digit grass (*Digitaria eriantha*) mix. However, at the time of poisoning, the pasture was overwhelmingly Bambatsi panic.

Poisoning from panic grasses is classically associated with the grazing of moisture-stressed regrowth. In this case the pasture was mature, 40 to 70 cm high and setting seed. However, there had been 40 mm of rain at the time of the lambs' introduction to the pasture; this would have produced green shoots that may have been heavily preferentially grazed by the Dorper lambs in similar conditions to grazing regrowth.

Under these conditions Bambatsi panic can cause severe acute liver disease in juvenile sheep and goats. The saponin crystals produced by the plant can block the bile ducts, but this occurs only when a second factor (which is probably another compound produced by the plant, or a pasture fungus) reduces the animal's ability to process the crystals. The activity of this second factor seems to be favoured by short rainfall events in dry summers.

For further information contact Shaun Slattery, District Veterinarian, North West Local Land Services, Narrabri, on (02) 6790 7600.

Tick fever in a beef herd in north-east NSW

In March, a cattle producer north of Lismore contacted the district vet. A British-breed yearling heifer had died just minutes before in a seizure. It had been seeking shade and feverish the day before, and had gone down that morning. The producer had had two other yearlings die about 4 or 5 weeks before. They had also gone down after a short period of fever before death. All 3 yearlings had been introduced from the same property at Kyogle the previous August. The three were the only ones from that holding, so all cattle from that source had died. About 10 weeks previously an adult cow from another Kyogle property had also developed a fever. It had responded to treatment with an anti-inflammatory but had then gone missing, presumed dead. Most of the other cattle had been introduced from Beaudesert (in south-east Queensland) in early 2017.

The owner had been treating the cattle with acaricides every 4 weeks.

A post mortem was conducted within 30 minutes of death, so all tissues were well preserved. Anthrax ICT was conducted and was negative. The heifer was in good condition and no ticks were seen. Palpation and deep sectioning of muscle revealed no evidence of blackleg. Lymph nodes were grossly enlarged and watery on the cut surface. The spleen was three times normal size and bulged when cut. The liver was swollen, with rounded margins and a cobblestone surface. It was yellow-tan in colour and friable on the cut surface. The surfaces of the heart had numerous small haemorrhages. The bladder was full and the urine was blood stained. The urine was positive for blood, protein and ketones on testing.

A provisional diagnosis of tick fever due to the protozoan *Babesia bovis* was made, and the private vet for the property was contacted to order in some imidocarb.

Greatly enlarged spleen in a heifer with tick fever. Photo P Kemsley

Babesia bovis was confirmed from both smear examination and PCR testing. Histopathology was consistent with *Babesia* infection.

Subsequent inquiry through the Cattle Tick Program confirmed that cattle ticks were present on the Kyogle property of origin. Presumably, at least one of the cattle from Beaudesert was a carrier of the tick fever organism, and the introduction of cattle ticks enabled the spread of the disease.

Because the heifer had had a seizure and an old shed was in the paddock, a search was also made for lead, but none was found.

For further information contact Phillip Kemsley, District Veterinarian, North Coast Local Land Services, Lismore, on 0427 896 822.

Footrot and cattle tick surveillance

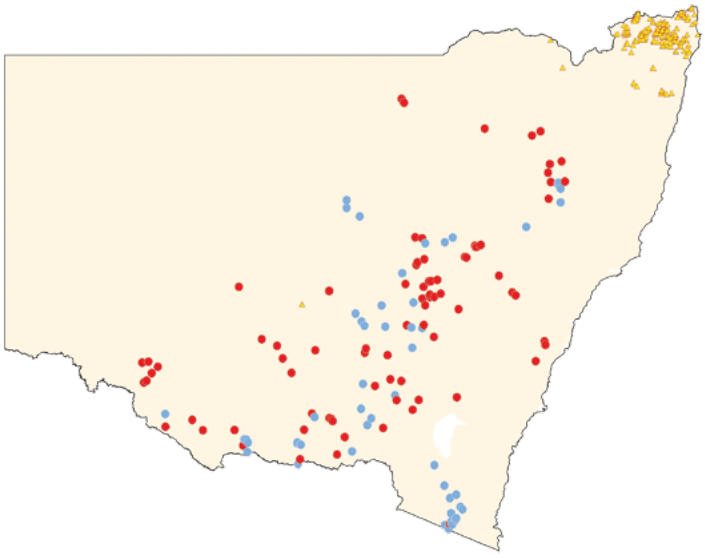
One of the purposes of surveillance is to identify properties on which stock are affected by a notifiable disease or pest so that action can be taken to prevent the spread of the disease or pest to other properties. Two of the things this applies to are cattle ticks and footrot.

Sheep footrot used to be widespread: as many as 40% of flocks in particular regions were once affected, but after many years of hard work by farmers, supported by Local Land Services and footrot contractors, the prevalence has been reduced to less than 1% of properties on a regional basis, saving the industry an estimated $20 million statewide.

Similarly, cattle ticks have been confined (with occasional exceptions) to north-eastern NSW, and the control program is estimated to have saved the cattle industry about $30 million.

The map at right shows how surveillance over a 1-year period identified the approximate locations of virulent footrot and cattle tick infestation; in the case of footrot it also shows the approximate locations of properties where the control program worked and the disease was eliminated.

For further information contact Rory Arthur, Manager Animal Disease Surveillance, NSW DPI, Orange, on (02) 6391 3608.



Approximate locations of new and resolved cases of footrot, April 2017 to March 2018, and cattle tick infestations, March 2018. Red dots are locations of virulent footrot infections as at 31 March 2018. Blue dots are locations of virulent footrot infections (resolved), April 2017 to March 2018. Yellow triangles are locations of cattle-tick-infested properties as at 31 March 2018.

Bovine papular stomatitis: foot and mouth disease excluded

Late on a Friday afternoon in January a producer from the Boorowa region contacted the district vet with concerns. He had noticed ulcers on the muzzles, and in the mouths, of multiple heifers that he had purchased 10 days ago from the saleyards. The lesions had been noticed when the cattle had been yarded to treat multiple cases of pink eye. The district vet observed the whole mob and then selected three of the affected heifers for closer inspection, photography and sampling. The cattle appeared well, and there was no drooling. No lesions were found on any of the feet or any of the tongues, but all of the heifers had multiple erosions on the gums, dental pad and muzzle. The erosions were of variable sizes between 2 and 15 millimetres. The centre of the ulceration was necrotic and slightly depressed, surrounded by a ring of inflammation. No fluid-filled vesicles were seen.

The cattle had been grazing a paddock with saffron thistles and had been boxed with the producer's cattle, which included a beast persistently infected with pestivirus. Infectious bovine rhinotracheitis (IBR) was suspected, as conjunctivitis was also present.

Blood and swab samples were submitted to the Australian Animal Health Laboratory for foot-and-mouth disease and vesicular stomatitis exclusion; all results were negative. Testing for IBR using the real-time PCR test for bovine herpesvirus 1 was negative except in the case of one heifer, which was weakly positive, indicating a transient infection.

The photographs taken appeared typical to the pathologist of bovine papular stomatitis, and electron microscopy was used to identify the cause, namely parapoxvirus (an orf-like virus).

Bovine papular stomatitis is a mild, self-limiting viral disease usually affecting cattle less than 2 years old. It can cause skin lesions in humans.

For further information contact Alexandra Stephens, District Veterinarian, South East Local Land Services, Yass, on (02) 6118 7700.

Bovine papular stomatitis in a heifer. Photo A Stephens

Duck viral enteritis exclusion

In early January the district vet was called to visit a small poultry producer near Yass. Ten per cent of the producer's home-bred Muscovy ducks were dying as they reached the 3- to 4-month stage. The signs were slowly progressive, beginning with conjunctivitis and progressing to appetite depression, green watery diarrhoea, and profound and progressive hindlimb weakness and ataxia followed by death. New birds from Queensland had been introduced to the flock. The owner had been recently unwell, with a chronic respiratory condition, so it was felt important to rule out psittacosis through conjunctival, tracheal and cloacal swabbing of multiple affected birds. These swabs were all negative for *Chlamydia psittaci* on PCR testing. Post mortem examination of an affected duck revealed pectoral muscle wasting and congestion of the sinuses; all other organs looked normal. Histopathology of the organs showed marked degeneration of the liver. Duck viral enteritis was felt to be very unlikely, but it was an important exotic disease to rule out because of the disease's occurrence in adult birds, the mortality rate, and the diarrhoea and ataxia. All tests conducted at the Australian Animal Health Laboratory on fresh liver and cloacal swabs using the TaqMan Assay were negative for duck hepatitis virus 1. The owner was using a home-mixed diet, which may have been deficient in Vitamin E or B. A commercial duck diet for the correct stage of growth was recommended for a treatment trial. The owner reported that the deaths had ceased and the ducks had become healthy following changes to the diet.

Progressive hindlimb weakness of an unconfirmed cause in ducks. Photo A Stephens

For further information contact Alexandra Stephens, District Veterinarian, South East Local Land Services, Yass, on (02) 6118 7700.

An unusual case of pestivirus

In early March, a producer in the Riverina contacted the district vet following the deaths of 12 weaner cattle over a 5-day period. The mixed-breed calves had been purchased from two different interstate locations and had been introduced to the property in two mobs 2 to 3 weeks earlier. Deaths and sickness were occurring in both mobs and across different paddocks. The mobs had been kept separately from each other and had not been mixed at any point. The producer's home-bred cattle, including similar-aged calves, showed no signs of illness or death. Before the deaths occurred, the two mobs had been yarded in separate yards for processing. They had received a 5-in-1 vaccine, vitamin B12 injection, multimineral injection, and a backline treatment for internal and external parasites.

Signs of illness included frothy nasal discharge, heavy breathing, swaying of the hindlimbs, or stumbling and a drooped head and ears. Some animals appeared to die quickly, whereas others were sick for 2 or 3 days before lying down, becoming dehydrated and dying, despite treatment attempts.

Physical examination revealed a variation in clinical signs among the affected calves. In general, calves had signs of severe dehydration, weakness of the hindlimbs, pale or injected mucous membranes, normal chest sounds and normal or low rectal temperatures. One calf had an elevated rectal temperature and harsh lung sounds. Post mortem examination of this calf revealed pneumonia. Purulent material in the trachea was the most prominent finding on post mortem examination of another calf in the same mob. This calf tested positive for pestivirus antigen, identifying it as a persistently infected animal.

Various samples were submitted to the laboratory. Blood screening indicated non-specific alterations in liver and muscle enzymes. Tests for infectious bovine rhinotracheitis and chlamydia, and bacterial culture, were negative. Selenium levels were normal.

Deaths appeared to ease by mid- to late March, but then four more calves died over one weekend in early April. The district vet revisited the property to reassess. Two affected calves from the second mob were examined and showed signs similar to those of the previous calves. Blood was collected and submitted to the lab. The first calf tested positive for pestivirus antigen. The results for the second calf showed that it had recently been exposed to pestivirus. Foot and mouth disease exclusion testing was also performed because of ulceration in the mouth of the calf identified earlier as persistently infected with pestivirus.

Investigating herd health problems can be challenging, and the findings don't always fit the textbook descriptions of how diseases should appear. Bovine viral diarrhoea virus (pestivirus) is typically thought to be a transient infection that causes mild or subclinical disease in naïve animals. However, in this case, it appears that a number of persistently infected calves were purchased as part of the mobs, and that these calves had then produced enough cytopathic virus to infect other cattle in the cohort. This, combined with the normal management stressors of moving across properties, and handling and yarding for management purposes, appears to have led to an unusually high level of clinical disease suspected to have been caused by bovine viral diarrhoea virus.

For further information contact Kristy Stone, District Veterinarian, Riverina Local Land Services, Gundagai, on (02) 6940 6900.

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*

Published by NSW Department of Primary Industries, a part of NSW Department of Industry

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

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

Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing (May 2018). However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of NSW Department of Industry 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.

JN 14861 5/18