

NEW SOUTH WALES

ANIMAL HEALTH SURVEILLANCE

January–March 2015 » Issue 2015/1

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|---|--|---|
| 2 Livestock Health Management System (LHMS) starting to produce results | 4 Lightning strike in cattle | 5 Salt toxicity in a beef herd |
| 3 Juvenile sporadic thymic lymphoma in a heifer | 4 Anthrax in NSW, January to March 2015 | 6 Ryegrass staggers affects Tablelands sheep |
| | 5 'Weaner colitis': 20% mortality in a sheep flock | 7 Suspected redroot amaranth in calves—first Australian report? |



Livestock Health Management System (LHMS) starting to produce results

The Animal Disease Surveillance Program is about proving we know where serious, market-threatening animal diseases occur (and, importantly, where they don't) so that governments can give real or implied health certificates that say, 'Buy with confidence — this is clean and green'.

Diseases that carry a legal obligation to notify state or federal authorities are called 'notifiable diseases'. Such diseases can pose a serious threat to Australian livestock markets. Notifiable diseases include anthrax, avian influenza, Hendra virus, cattle tick infestation, tick fever, sheep footrot, Johne's disease, and all of the exotic diseases such as foot-and-mouth disease. Owners and private vets report, and District Vets actively search for, cases of sudden death, high death

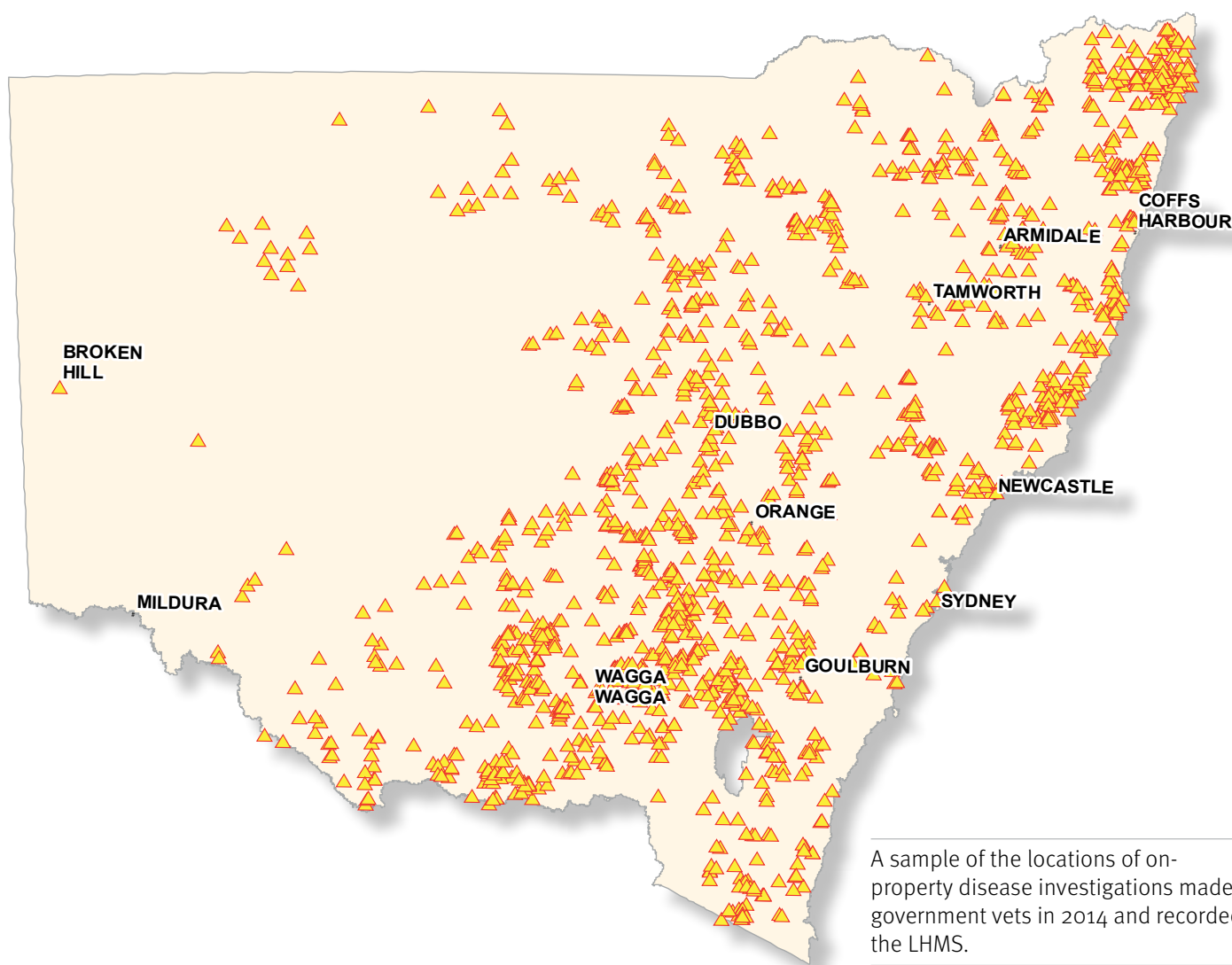
rates and unusual disease occurrences to make sure that the cause is not a notifiable disease. If a notifiable disease is found, then the relevant control program is implemented to stop it spreading. It's when these diseases spread that the worst market failures occur. So a good animal disease surveillance system benefits individual producers *and* the whole community.

Knowing about the diseases we don't have in Australia also stops the importation of animals and animal products from overseas countries where the animals have a poorer health status than ours. This is why we prevent, for example, imports of beef and fresh poultry from certain overseas countries.

Introducing a disease database called the Livestock Health Management System (LHMS) has made it easier for District Vets to record the cases they investigate. There have been some transition issues and teething problems in getting all of the data into and out of the database. The map below is an example of how the system works, but it doesn't show all of the cases, and any gaps that exist don't accurately reflect the surveillance effort—they just mean that not all of the data are on the map yet. More work on the LHMS technology is under way.

Nevertheless, the map does illustrate the generally widespread coverage of on-property disease surveillance that we achieved in 2014.

Continued on page 3



A sample of the locations of on-property disease investigations made by government vets in 2014 and recorded in the LHMS.

Continued from page 2

Our goal is to always remain 'ahead of the game' in terms of professionalism in the disease surveillance system run by Local Land Services and NSW DPI, as it has great advantages for producers in terms of gaining access

to markets. When we refine LHMS and other technologies, it will be possible to see, in real time, the investigations of suspected notifiable diseases being undertaken by District Vets at any moment in a day (though this would be important only during an emergency disease outbreak). As far as we know,

this is something that no other disease surveillance system in the world can claim. That's innovation!

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

Juvenile sporadic thymic lymphoma in a heifer

In early February 2015, one Angus heifer from a mob of 110 on improved pasture south of Bathurst died, and a second was seen to be lethargic and reluctant to move. The calves, including this heifer, had been weaned 2 weeks previously and had been wormed with moxidectin and vaccinated with 5 in 1. The cows had also been vaccinated against pestivirus.

The 7-month-old heifer was observed in the paddock to be dull, standing apart from the mob. She had marked swelling of the throat and brisket, whereas the hindquarters and ribs appeared thin. In view of the poor prognosis, the heifer was euthanased in the paddock and necropsied. The most remarkable finding, apart from the massive swelling of the throat and bottom of the chest, was a firm pale pink/grey tumour in the front of the thorax. The heifer was found to be negative for enzootic bovine leucosis (EBL) virus and for pestivirus antigens. The tumour, which had spread to other tissues, including the regional lymph nodes, heart and liver, was described as a thymic lymphoma.

Cattle can suffer from not only EBL but also a sporadic bovine leucosis of unknown cause. Three forms of sporadic bovine leucosis are recognised: the juvenile form, the cutaneous form, and the thymic form, which is the rarest. Given that EBL has been eradicated from the national dairy herd, continued surveillance of cattle is important. This heifer was negative for EBL virus, but because an inherited form of thymic lymphoma has been described in Holstein heifers, surveillance is important to identify

any emerging familial trends. There was no history of lymphoma on this property, although the cause of death of the first heifer was not determined.

For further information, contact Bruce Watt, Team Leader, Animal Biosecurity and Welfare, Central Tablelands LLS, Bathurst, on 6333 2303.



Affected heifer showing marked swelling of the front and bottom of the chest and wasting of the hindquarters. Photo B. Watt



Thymic lymphoma in the anterior thorax. Photo B. Watt

Lightning strike in cattle

Every year thousands of animals worldwide succumb to lightning injuries. This article reminds District Vets that lightning strike in livestock is a possible diagnosis in suspected anthrax cases.

District Vets in the Riverina LLS have seen two lightning strike incidents in livestock in the last 12 months. It's rarely reported in the literature.

In one case, a landholder from the Young area called the District Vet to report the sudden death of 2 steers out of a mob of 140.

The District Vet could see that blood had oozed from the animals' nostrils, eyes and anus. Both animals had died within a few metres of one another and were located close to a creek bed. There had been storms in the area the day before.

Anthrax, which was suspected because of the blood oozing from the animal's orifices and the rapid decomposition, was ruled

out by an immunochromatographic test (ICT). To confirm this exclusion, samples (an impression blood smear and a piece of ear) were taken and sent to Elizabeth Macarthur Agricultural Institute. The results were negative.

Ruling out anthrax allowed the District Vet to do a post-mortem examination. He saw singe marks on the outside of the right hock and unchewed food in the mouth. There were major haemorrhages in the chest organs (see photos). Lightning strike was the diagnosis.

Mechanisms of lightning strike injury include direct strike, side flash (when lightning strikes an object and then jumps from it to the animal), step potential (the voltage between the feet of an animal standing near an energised grounded object), touch potential (the voltage between the energised object and the feet of an animal in contact with

it), and transmission to the animal via root systems. Step potential is the most common cause of injury in animals and involves the spread of electricity away from the point of contact in concentric rings. Each ring is associated with a different voltage. It is the position of the animal's feet relative to the potential difference between the rings that does the damage.

To diagnose lightning strike, there should be a history of lightning exposure and evidence of sudden death or injury. Half-chewed food might be found in the mouths of dead animals. Singe marks, scorching of the grass and tearing of the bark of nearby trees are also clues that lightning strike may have been the primary cause of death or injury.

For further information contact Rahul Shankar, District Veterinarian, Riverina LLS, Young, on (02) 6381 4700.



The steer's trachea was filled with blood as a result of the lightning strike. Photo R. Shankar



Lightning strike caused blood loss from all external orifices of this steer. Photo R. Shankar

Anthrax in NSW, January to March 2015

There was one positive confirmation of anthrax during the quarter. A single bull died in early March on a property in the Condobolin district. This bull was running with seven other bulls, none of which was affected. A total of 25 bulls, 740 sheep and 2 horses on the property were vaccinated. The incident was managed in accordance with NSW DPI anthrax policy: The property was placed in quarantine, the affected carcass was burned to ash, all animals on the property were vaccinated, and NSW Health was

notified. There had been no movements of livestock on or off the property in the preceding 20 days. There was no recorded history of anthrax on this property, but it is located in the known endemic anthrax region of the state.

In another incident, anthrax was excluded in a dairy cow near Berrigan that had died suddenly. The cow gave a weak positive reaction to an ICT. All follow-up laboratory testing, including further ICT, PCMB (polychrome

methylene blue) staining, culture and PCR (polymerase chain reaction), was negative. The clinical history of the cow's rapid death indicated that she would have had bacteria in the bloodstream at the time of death and would have tested positive had this been due to anthrax. Her ICT reaction was considered to be a false positive.

For further information contact Barbara Moloney, Technical Specialist Disease Surveillance, NSW DPI Orange, on 02 6391 3687.

‘Weaner colitis’: 20% mortality in a sheep flock

In February 2015, a District Vet was called to investigate chronic scours leading to ill-thrift and death in a high proportion of Merino weaners in a flock in the Holbrook area.

The spring-drop lambs had been weaned in late November, at which time they had received their second vaccination and an oral wormer (moxidectin). In late December the manager had noticed some of the mob lagging and scouring, with some deaths, and had decided to draft the weaners into four mobs on the basis of size. On the advice of a consultant vet, he drenched the two lightest mobs with monepantel and gave three consecutive daily treatments of an oral sulfadiazine preparation for suspected coccidiosis. No improvement was noticed in the lightest mob, so a faecal egg count was done before another course of oral sulfadiazine treatment was started. No parasites were found in the faecal egg count.

By the time the District Vet was called in February about 200 lambs had died. Of the remaining thousand, 260 were in the tail group and had dark scours of varying degrees of chronicity. The three

worst-affected lambs were selected by the manager and were examined before euthanasia and autopsy. Rectal temperatures were 40.3°C, 40.5°C and 40.5°C, although stress and sun exposure might have contributed to these high readings. Each lamb had dags consistent with chronic scour and some signs of fresh scour. A range of samples were taken from the first lamb post mortem, with a focus on the digestive tract. Watery diarrhoea with mild, chronic intestinal inflammation was the only abnormality noted. Incomplete autopsies were performed on the other two lambs, and a kidney that looked mottled on the surface was collected from one of them. Samples were sent to the state lab for further diagnostics.

The light mob was treated again with 3 consecutive days of oral sulfadiazine solution and moved to a different paddock. They began to improve within a few days and the manager believed they had fully recovered within a week.

Lymph node samples were cultured for *Salmonella*, *Yersinia* and *Campylobacter* but each test was negative. Faecal egg counts showed a low number of parasite

eggs but no coccidia. Histopathology was performed on several tissue samples. Examination of the kidneys from two animals revealed nephritis associated with oxalate crystals, but this may or may not have been significant. The intestinal epithelium was eroded, with moderate crypt damage and inflammatory infiltrates.

Although no definitive diagnosis was reached in this case, the presentation and laboratory findings are most consistent with the syndrome ‘weaner colitis’, which has often been associated with a *Campylobacter*-like organism that is difficult to culture. Industry research has focused on *Salmonella* and *Campylobacter* as causes of scours in sheep, although other organisms may also be present and of greater significance in some cases. The manager of the flock reported that scour responding to sulfadiazine drench had occurred in this flock after weaning for at least the previous 5 years. More research into this condition is warranted.

For further information contact Scott Ison, District Veterinarian, Murray LLS, Albury, on (02) 6040 4210.

Salt toxicity in a beef herd

A herd of Angus cattle in the Dunedoo area was investigated for sudden weight loss, scouring and death. Two weeks earlier the cows and calves had been moved into a new paddock containing native grasses, large amounts of blue heliotrope and some Solanaceae species. Since moving into the paddock, the cows, which had previously been in good body condition, had rapidly lost weight. Some had developed moderate to marked scouring, and one weaner that had been kept with the mob had died next to the dam. The cattle had been moved down from Queensland a few months earlier.

A pregnant cow had been found weak with muscle tremors and had died a few hours later. A post mortem was done on this cow, but an enlarged,

pale purple liver was the only notable thing found.

An examination of the remainder of the herd showed poor body condition and marked scouring in some individuals, with both cows and calves affected. Some individuals had abnormally fast heart and breathing rates, but the animals were quite stressed by handling. No neurological abnormalities were noted.

Faecal egg counts were mostly negative, with one individual having a very low strongyle count.

Histological findings included chronic mild fibrosis around the portal vein of the liver and bile duct proliferation consistent with chronic ingestion of pyrrolizidine alkaloids. There were also signs of mild infection with *Sarcocystis*

protozoa in the heart muscle. There were no histological changes in the brain consistent with salt toxicity.

Blue-green algae testing of the dam water was negative, but further water testing showed an electrical conductivity of 25 300 µS/cm. The electrical conductivity is a measure of the salinity of the water; this level is considered dangerous to stock.

The high salinity in the dam water and consistent clinical signs led to a diagnosis of salt toxicity. The lack of consistent histological signs was considered unimportant, as the histological changes can be unreliable.

For Further information contact Cecily Moore, District Veterinarian, Central West LLS, Coonabarabran, on (02) 6842 6606.

Ryegrass staggers affects Tablelands sheep

Three first-cross ewe lambs were found dead in a dam, and two more were lying on their sides in the paddock. At least 20% of the mob of 250 six-month-old lambs showed nervous signs of ryegrass staggers when moved. The lambs were hyperexcitable, travelling between a few metres and up to 200 metres before showing progressive gait abnormalities leading to collapse.

Lambs affected by ryegrass staggers show no symptoms until disturbed. They move with a wide-based stiff-legged bounding gait, with the head lowered (see photo). They eventually fall with legs extended and paddle while attempting to rise. If left undisturbed, they regain their feet within a few minutes.

The lambs were grazing a pasture of about 1200 kg dry matter/hectare comprising 90% dead grass carried over from an abundant spring and 10% green grass (predominantly ryegrass) emerging through the dry plant debris (see photo). The area had received no significant rainfall in the preceding 6 weeks, apart from about 20 millimetres seven days before the outbreak.

This case was typical of several reports of ryegrass staggers associated with the same rainfall event on sheep properties across the Southern Tablelands. Weaned lambs and hoggets were most commonly affected. One owner reported the condition in a mob of mixed-age Merino ewes grazing oat stubble but noted that symptoms occurred only in the youngest group of ewes (1.5 years) in the mob.

Ryegrass staggers occurs in sheep, cattle and horses. It is caused by a tremor-causing toxin produced by the fungus *Neotyphodium lolii* on perennial ryegrass. This fungus is an endophyte, which means that it can live on the plant for at least part of its life without causing disease. The fungus is concentrated in the



Lambs by ryegrass staggers have an anxious look, with a stiff neck, lowered head, and a bounding stiff-legged gait with all four feet off the ground. Photo B. Watt



Typical pasture grazed by the lambs that were affected by ryegrass staggers. This photo was taken 7 days after 20 millimetres of rain. Green ryegrass shoots are emerging through dry trash. Photo B. Watt

lower leaves (new growth) and seed heads, mainly of older perennial ryegrass cultivars.

Affected stock that are moved quietly to safe pasture or fed in a feedlot recover quickly, usually within 1 to 2 weeks. Animals that are down are a challenge, as they struggle violently

when helped to rise. Less severely affected animals have reduced growth rates and often scour.

For further information contact Bruce Watt, Team Leader, Animal Biosecurity and Welfare, Central Tablelands LLS, Bathurst, on 6333 2303.

Suspected redroot amaranth in calves—first Australian report?

In February 2015, an owner reported to the District Vet that five of 40 unweaned Angus-cross calves had died on his property in the Central Tablelands of NSW.

The mob had been in a paddock for 10 days when the first calf was found dead. Another two were found dead the following day, and the mob was moved. A number of juveniles appeared slow and weak. The stock had been vaccinated against clostridial diseases.

The producer reported that the calves had been quiet, lying down and reluctant to move, but had improved in the 2 days since he had moved them and called the District Vet. The District Vet examined three calves and found that they were able to walk into a race without difficulty. They were clinically normal, except for pale gums in calves 2 and 3.

Blood samples (but not urine samples) were taken from all three calves for full ruminant biochemistry, complete blood counts and assessment of nitrate and nitrite levels.

Calf 3 died the day after the blood samples were taken but was not available for a post mortem. Calf 2 was given supportive treatment but died 6 days after the blood sample was taken. When found, the calf was too decomposed for a meaningful necropsy to be done, but the bladder was punctured to collect urine for analysis.

The paddock where the stock died contained predominantly cocksfoot and phalaris. There was a mature stand of *Amaranthus retroflexus* (also called redroot amaranth, redroot pigweed or Prince of Wales feather), which comprised approximately 5% of the herbage mass. The *A. retroflexus* had been heavily grazed. The stock readily consumed it, and when moved to another paddock they sought it out. The producer commented that the stock seemed 'addicted' to it, and this aroused suspicion that it may have been involved in the problem.

Amaranthus retroflexus is a weed in NSW, Victoria, Tasmania, SA and WA. It invades summer crops, cultivated fields, paddocks, gardens, disturbed habitats, open ground and roadsides.

All parts of the plant are considered poisonous. It contains an unidentified toxin that damages the kidneys. All parts can induce kidney failure, and the stems and leaves can also contain toxic amounts of nitrate. Cattle, sheep, goats and pigs are susceptible to kidney failure and ruminants can also succumb to nitrate or nitrite toxicity.

Laboratory testing of the samples submitted by the District Vet showed that the nitrite/nitrate levels in all animals were normal, ruling out nitrate poisoning.

However, samples from calves 2 and 3 indicated major kidney damage. There was a marked azotaemia, with urea at 72.9 and 85.1 mmol/L (reference range 2.1 to 10.7 mmol/L) and creatinine at 1403 and 1867 mmol/L (reference range 0 to 186 mmol/L). Calves 2 and 3 also had elevated creatinine kinase levels at 348 and 1033 mmol/L (reference range 0 to 300 mmol/L). There was a significant hypocalcaemia in calf 2 at 1.38 mmol/L and calf 3 at 1.28 mmol/L (reference range 2 to 2.75 mmol/L). Calf 3 also had a moderate hyperproteinaemia at 95 g/L (reference range 60 to 85 g/L) and a significant hyperphosphataemia at 5.54 mmol/L (reference range 0.80 to 2.80 mmol/L).

Consequently, the District Vet diagnosed suspected *A. retroflexus* toxicity on the basis of the presence of the toxic plant and evidence of kidney damage. At the same time, other causes of tubular necrosis were ruled out. No other plants potentially containing toxic amounts of oxalates were found. There was no history of aminoglycoside use, access to chemicals such as ethylene glycol, or access to supplementary feed potentially containing mycotoxins.

A range of clinical signs, laboratory results and post mortem findings have been reported to be associated with poisoning of cattle by *A. retroflexus*. Clinical signs reported include incoordination, serous nasal discharge, diarrhoea (which may be blood tinged) and subcutaneous swelling.

Cases of nephrotoxicity in cattle attributed to *A. retroflexus* have been reported infrequently in the veterinary literature in the US, Canada, Brazil and Slovenia. This appears to be the first reported Australian case of kidney failure suspected to have been caused by *A. retroflexus*.

For further information contact Lucienne Downs, Central Tablelands LLS, Orange, on (02) 6363 7883.

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'.

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

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Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing (May 2015). 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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