NSW GOVERNMENT

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ANIMAL HEALTH SURVEILLANCE

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In this issue

Abattoir monitoring for ovine Johne's disease

Ovine Johne's disease (OJD), which is caused by the bacterium *Mycobacterium avium* subsp. *paratuberculosis*, cost the Australian sheep industry an estimated $1,005,325 in 2015. The industry funds a targeted surveillance program for the disease and for a number of other conditions of interest to sheep producers.

Animal Health Australia recently released the 2016–17 Annual Report of the National Sheep Health Monitoring Project (NSHMP). It showed that between 3% and 4% of 108 direct lines of NSW sheep sold to abattoirs were positive for ovine Johne's disease. This compares with about 8.5% of 408 direct lines in Victoria, about 2.5% of 402 direct lines in Western Australia, and less than 1% in Tasmania and South Australia (3631 direct lines were inspected in South Australia).

Inspection for OJD is focused on animals over 2 years old (when they are more likely to display signs) and on lines sold directly to abattoirs, because they are easier to trace to the property of origin. When an inspector suspects OJD, they send samples to a laboratory for histopathological diagnosis. NSW DPI forwards both positive and negative results to owners and district vets to help provide advisory services on control programs if necessary.

For further information contact the NHSMP Program Manager, Animal Health Australia, on (02) 6232 5522.

Trucking-associated mortalities in lambs not from anthrax

A producer in the Riverina Local Land Services area called the district vet in December following the sudden death of twenty 5-month-old lambs out of a mob of approximately 800 that had been weaned less than a month previously.

The mob had been purchased online and transported for about 7 hours to their destination about 75 kilometres north of Wagga Wagga. After being held in the yards overnight with hay and water the lambs were drenched and vaccinated and then walked about 1 kilometre to a paddock of barley stubble. The animals had travelled well, but after only a few hours several of them were found dead and many more appeared unwell.

The district vet observed that the mob was in poor body condition and at least 30 were unsteady on their feet. Some had a stilted and twitchy gait, often accompanied with a hunched body position.

Two lambs were lying down and unable to rise, with twitching of the limbs, frothing at the mouth, and elevated respiratory and heart rates. Post mortems were performed on these animals in addition to several others that were found dead.

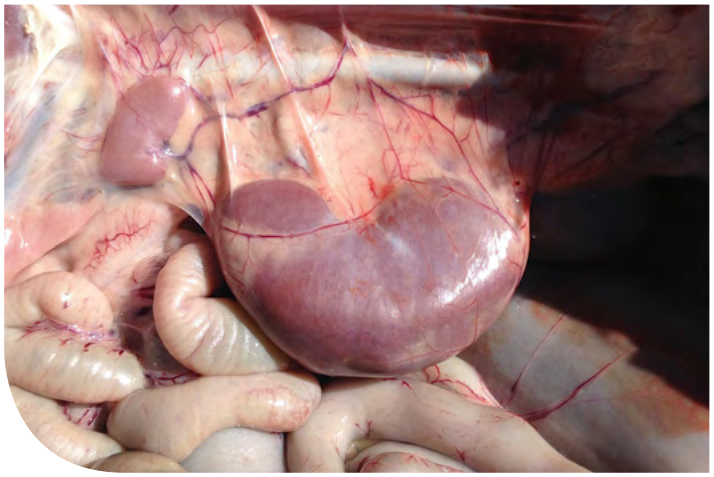
All of the lambs examined by post mortem had poor visceral fat coverage but no obvious abnormalities.

In the absence of signs consistent with anthrax or lead intoxication, the vet provisionally diagnosed transit tetany and the lambs were given good quality hay and mineral lick supplements. A number of downer lambs were injected with a subcutaneous bolus of calcium solution, but only a couple showed improvement from this treatment. Following the change in diet, no further deaths occurred.

Laboratory results on serum samples from five clinically affected animals subsequently showed that the affected lambs had ketosis and low blood calcium and magnesium levels. It is likely that a combination of factors, including feed deprivation, poor energy reserves and the stresses of transport, yarding and handling, resulted in significant disturbances to the lambs' metabolism and thus caused transit tetany. This is a very difficult condition to treat once animals are severely affected.

For further information contact Tim Biffin, District Veterinarian, Riverina Local Land Services, Wagga Wagga on (02) 6923 6314.

Transit tetany: recumbent lambs are shown, with the mob in the background grazing stubble. Photo T Biffin



The left kidney of a lamb with transit tetany, showing poor fat coverage. Photo T Biffin

Pestivirus outbreak in a commercial beef herd: exclusion of foot-and-mouth disease

In September, the district vet from Dubbo (Central West Local Land Services) diagnosed bovine viral diarrhoea virus (BVDV, also known as pestivirus) in beef cattle on a local property and excluded foot-and-mouth disease.

The property had lost ten 6-month-old weaners over 2 weeks from a mob of 60 head. Several other weaners were showing clinical signs, including fever, scours, ill-thrift, lack of appetite, sunken eyes and swelling under the jaw. All appeared underweight and in poor condition for their age, with rough coats. Some had erosive lesions on the insides of the cheeks.

Laboratory testing found that three out of the four weaners were persistently infected with BVDV, and the fourth calf tested strongly antibody positive for the virus. Samples of faecal material were negative for *Salmonella* and *Yersinia* species.

A clinically affected 18-month-old heifer in the breeding mob was euthanased. Post-mortem findings included erosive lesions in the insides of the cheeks; black, tarry and bad-smelling faecal material in the lower intestine; a necrotising haemorrhagic jejunitis (i.e. inflammation of part of the small intestine); and black, necrotic ileocaecal lymph nodes. Histopathology of the large intestine was consistent with severe bacterial infection.

A tail hair sample was positive for pestivirus. Samples forwarded to the Australian Animal Health Laboratory at Geelong were negative for foot-and-mouth disease virus and for vesicular stomatitis virus.

Article by Jess Van De Weyer, formerly District Veterinarian, Central West Local Land Services, Dubbo. For further information contact Jillian Kelly, Team Leader, Central West Local Land Services, Coonamble, on 02 6822 1588.

Scabby mouth in sheep: foot-and-mouth disease excluded

In December, a producer east of Wagga Wagga contacted their local district vet after noting lesions in the mouths of about 25% of a mob of 1-year-old lambs that had previously been vaccinated at lamb marking against contagious pustular dermatitis ('scabby mouth' or 'orf').

The lesions were initially dark red, progressing to scabs, mainly at the corners of the mouth. The district vet provisionally diagnosed scabby mouth, despite the vaccination history.

One sheep was observed to be depressed and salivating, with scabbed lesions on both corners of the mouth but no other oral lesions. Another sheep had a dental pad lesion; it was irregularly shaped, with reddened borders, but it was not fluid filled or ulcerated.

Samples were collected to confirm scabby mouth and exclude foot-and-mouth disease. In the vet's opinion, if the dental pad lesion had resulted from foot-and-mouth virus infection, the lesion must have been older than 10 days. Consequently, as well as collecting epithelial tissue (scabs) in sterile pots and PBGS (a viral transport medium), the vet collected clotted blood for antibody detection.

Antibody and antigen testing at both Elizabeth Macarthur Agricultural Institute and the Australian Animal Health Laboratory confirmed that the samples were negative for foot-and-mouth disease and vesicular stomatitis. Subsequently, electron microscopy of four of the fresh scab samples was positive for scabby mouth virus.

Scabby mouth can occur in vaccinated sheep because of poor vaccination technique, exposure to a high viral load (especially in physiologically stressed animals), or poor vaccine storage and handling. The district vet engaged representatives from the vaccine manufacturer to help the producer prevent future outbreaks of scabby mouth on the property.

For further information contact Tim Biffin, District Veterinarian, Riverina Local land Services, Wagga Wagga on (02) 6923 6314.

Scabby mouth: dental pad lesion with complete epithelial coverage and smooth red margins. Photo T Biffin

Scabby mouth: older scabbed lesion in the corner of the mouth. Photo T Biffin

Abomasal impaction or emptying defect in rams

Large, impacted abomasa were found on post mortem examination of Merino rams that had been progressively losing weight, going down and dying since being moved from a drought-affected region of South West Queensland to a drought-affected property in North West NSW.

These were a mob of 2- to 4-year-old Merino rams of one bloodline. The resident rams on the NSW property, which were of different bloodlines, were not affected, despite being fed the same diet.

The rams had arrived on the property 8 weeks before being investigated by the district vet. The owner reported that the rams had shown progressive weight loss and lethargy, were bloated on both sides, and would stagger, eventually staying down and dying.

On examining a ram with typical signs, the vet observed it to be bloated on the left side, with a large, firm, palpable mass in the lower right side of the abdomen. The rumen was moving more frequently than expected. The ram tended to lie down, but could raise itself and move away. It appeared dull and unaware and was easily caught. Respiratory and heart rates were elevated.

At post mortem, the abomasum of each affected ram was about 40 cm x 20 cm and contained a football-sized consolidated mass of fibre, barley grain and faba beans, with an outer layer of compacted dirt. Both the rumen and the abomasum emitted a sour odour. The rumen content was a finely ground fibre that was slightly foamy. The remainder of the digestive system was empty, apart from a few dry pebbles of ingesta in the caecum. The laboratory histopathology report found degenerative changes in the liver and kidney, with chronic interstitial nephritis.

This ram flock in North West NSW suffered abomasal impaction. Photo J Ellem

Impacted contents of the abomasum in a sheep from North West NSW. Photo J Ellem

Because of the clinical presentation and some signs consistent with scrapie, the brain was submitted to the National TSE (transmissable spongiform encephalopathy) program for TSE exclusion. Literature from countries where scrapie is endemic has reported abomasal impaction in some scrapie-affected sheep. TSE was excluded in this case on histological examination of the brain.

Sheep can be affected by a condition called abomasal emptying defect (AED), which has been recorded in Suffolk, Hampshire, Dorset and Texel sheep. AED can occur when sheep are fed a high-quality diet of concentrates and good quality roughage. The cause is thought to be neurological dysfunction in the abomasum.

In this case the rams had been fed barley hay with faba beans for the first 6 weeks after arrival and then barley grain with barley hay for the next 3 weeks. The sheep were also grazing goathead burr and copperburr. Dry faba beans were observed in the abomasum, suggesting that the function of the abomasum had been compromised for 3 weeks or more. The affected rams had been moved: was the stress associated with the changes in feed and water intake implicated in this case, or was there another condition predisposing them to abomasal impactions?

After being advised to offer the rams more highly digestible roughage in their diet, the owner moved them to another property that had rain and where they had access to green Mitchell grass. Overall, 40 rams were lost. Once the abomasum is chronically impacted there is no practical, effective treatment to reverse the damage; sheep that were clinically affected were euthanased.

For further information, contact Judy Ellem, District Veterinarian, North West Local Land Services, Gunnedah, on (02) 6742 9220.

Targeted surveillance engages landholders

Not all the work of a district vet involves investigating suspected notifiable disease incidents. Some of the work is aimed at engaging local landholders so that they know who to contact as soon as they see serious diseases in their flocks and herds. One common job of the district vet is to run targeted surveillance programs to provide useful information to both official veterinary services and landholders.

During the last quarter, staff of Riverina Local Land Services collected blood samples from 17 feral pigs trapped as part of a controlled pest program in two general localities: Coolac, which is on the eastern side of the Local Land Services region, and Rankins Springs in the west. The samples were tested for leptospirosis and *Brucella suis* at the State Veterinary Diagnostic Laboratory.

None of the samples was positive for brucellosis, but nine of 17 samples were positive for *Leptospira pomona*, with a range of antibody titres from 50 to 800. All of the positive results were from feral pigs on two properties (one a sheep property and the other a beef property) in the Rankins Springs area.

Leptospira pomona causes abortion in pregnant cows, and it is likely that feral pigs can transmit infection to cows from urine-contaminated drinking water. The Local Land Services staff contacted a number of beef producers in the area to remind them to prevent abortions in cattle by making sure their vaccination protocols were up to date. At the same time, they encouraged producers to report any instances of unexplained sudden deaths, as anthrax has occurred in this area in the past.

Further work will be done to work out whether a free-range piggery in the same Rankins Springs area is being exposed to infection with brucellosis from feral pigs. *Brucella suis* was eradicated from commercial pig populations many years ago, but free-range pig raising has become more common and provides a potential pathway of infection from feral pigs, in which the prevalence of *Brucella suis* infection is difficult to determine. Although the rate of seropositivity in feral pigs is very low, a surprising number of 'pig dogs' used to help hunt feral pigs have developed infection (150 cases so far).

For further information contact Rahul Shankar, District Veterinarian, Riverina Local Land Services, Young, on 02 6381 4700.

Chronic copper poisoning in feedlot lambs

Chronic copper poisoning was diagnosed in feedlot lambs in September 2017 on a property near Forbes, in central NSW, following an investigation into sporadic sudden deaths.

These were first-cross lambs that had been bought into the feedlot and managed there for over 4 months. They had been vaccinated with 5 in 1 and drenched on arrival, and were being fed commercial pellets and barley. On the initial visit by the district vet, one dead animal was presented for post-mortem examination. It had high levels of glucose in the urine and a large amount of straw-coloured fluid in the abdomen and thorax that clotted on exposure to air. A provisional diagnosis of enterotoxaemia was made. Samples were collected and submitted for confirmation, but in the meantime it was recommended that the lambs be given a booster vaccination for clostridial disease.

In the days following vaccination there were a few deaths that were not investigated, but when it was reported that three animals had died suddenly 5 days after vaccination, the district vet made a second visit to the property. All three animals had mild yellowing of the sclera of the eye and grey-yellow discolouration of the lining of the mouth. Post mortem revealed bronze-coloured livers, dark red kidneys and dark red urine in all three carcases.

Copper poisoning was strongly suspected on the basis of these findings, and samples were submitted to confirm this suspicion. Pending these results, possible sources of copper in the diet were evaluated. From the history it was thought that long-term ingestion of low levels of copper in the commercial feed pellets was the cause, and the pellets were removed from the feeders. The deaths stopped within days.

The laboratory confirmed high levels of copper in the kidneys. There were no histopathological changes in the liver to suggest that chronic pyrrolizidine damage from toxic plants was a problem.

For further information contact Nik Cronin, District Veterinarian, Central West Local Land Services, Forbes, on (02) 6850 1600.

Post-mortem appearance of a lamb following chronic copper poisoning. Photo N Cronin

Lead toxicity

There were two cases of lead toxicity in the last quarter in the Forbes area.

The first case occurred in 120 steers grazing oats. The owner found one dead and one lying down on its sternum. The recumbent steer was non-reactive; it had a temperature of 40.6 °C, an increased respiratory rate and harsh lung sounds. It was champing its jaw, with open-mouthed breathing. When the tongue was pulled out it was slow to retract. A post-mortem examination of the dead steer revealed what looked like small fragments of lead in the rumen. There was a rubbish tip in the paddock, and a battery was later found there. Lead toxicity was confirmed on a blood test (3.74 µmol/L; the standard reference level is less than 0.24 µmol/L). The other steers in the herd were tested and 10 were detained on the property. The tip was fenced off.

The second case involved two sick heifers out of 40 that were also grazing oats. One was blind and one was lying down. A blood sample was taken from the surviving heifer by the district vet. The heifer had high blood lead levels (2.65 µmol/L). There was a site in the paddock where old tanks and bits and pieces had recently been dumped, but no definite source of lead was identified. This area was cleaned up. The remaining heifers were tested and nine of them were detained.

For further information, contact Belinda Edmonstone, District Veterinarian, Central West Local Land Services, Forbes, on 02 6850 1600.

Convulsions associated with vitamin A deficiency in orphaned lambs

In September 2017 a commercial sheep flock owner in the Pilliga district of North West NSW reported unusual deaths following convulsions in orphaned lambs being fed milk replacer.

The affected property was severely drought affected.

Ten lambs had been found orphaned over a period of a few weeks. They were strong, 2 or 3 days old, and were thought to have been mismothered during trail feeding of pelleted feed. The orphaned lambs were removed from the paddock as they were found and bottle fed in a pen.

Over a 2-week period, six of the 10 lambs died, showing 'fitting'—paddling, seizures and spasms in which they arched their backs—4 or 5 days after they had started bottle feeding. The initial convulsions were often followed by a period of normality for a few hours, before another episode of convulsions and then death.

At post mortem there was nothing obvious on initial examination. Possible diagnoses included clostridial infection, vitamin A deficiency and lead toxicity. (The lamb pen was on sandy soil in an old house yard.)

Frozen liver and kidney samples and fixed brain samples were sent to the State Veterinary Diagnostic Laboratory. No significant lesions were detected on histopathological examination of the brain, and no lead was detected in the kidney. The liver was found to have normal vitamin E levels (14.8 mg/kg; normal reference level >1.5 mg/kg) but low vitamin A levels (1.2 mg/kg; normal reference level >100 mg/kg).

On these results a presumptive diagnosis of vitamin A deficiency was made.

Between the property visit and the laboratory results the affected property received good rain, providing green pasture growth and alleviating any vitamin A deficiency. No further lambs were affected by the syndrome. The owner was advised that, in years when an oats fodder crop cannot be sown or when the crop fails because of dry conditions, Vitamin A should be given to the ewes by injection before lambing.

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

Monitoring imported cattle for mad cow disease

Since the appearance in the late 1980s of bovine spongiform encephalopathy (BSE, also known as TSE or transmissible spongiform encephalopathy) in the UK, cattle imported into Australia have been quarantined and monitored for illness. They are also tested for the abnormal prion protein following death.

The latest report from the National TSE Freedom Assurance Program indicates that only 15 imported cattle remain alive in Australia, after the deaths of 12 imported cattle for the year. There remains 1 animal from the EU/Japan in Victoria, as well as 14 cattle from the USA, which are located in the Northern Territory (3), Queensland (2), NSW (1), Victoria (2) and South Australia (6). There are no cattle remaining from Canada. No cases of BSE have been detected from this surveillance program.

Redgut in lambs grazing lucerne

In November 2017, a producer near Cowra reported losing, over 10 days, between 30 and 40 prime lambs grazing lucerne. They had not seemed ill before they died.

A post mortem by the district vet of a recently dead lamb found about 500 mL of bloody serum-like fluid in the peritoneal cavity. The intestines were discoloured dark red to black and markedly gas filled; they became increasingly dilated with increasing distance along the gut, starting about 50 cm distal to the pylorus and extending to the lumbar flexure of the colon. The rumen had a small amount of fresh lucerne and liquid present.

From the history and post-mortem findings the vet diagnosed intestinal torsion or 'redgut'. Redgut is often seen in animals grazing lush, highly digestible pastures—particularly lucerne. The feed moves rapidly through the reticulum and rumen into the intestines, causing intestinal hypermotility. This increased mobility and displacement can lead to torsion at the root of the mesentery.

'Redgut' caused by intestinal torsion. Photo K Peffer

This, in turn, restricts the blood supply, causing the parts of the gastrointestinal tract supplied by the anterior or cranial mesenteric artery to die.

The owner restricted access to the paddock lucerne and fed dry hay to prevent the problem recurring.

For further information contact Kate Peffer, District Veterinarian, Central Tablelands Local Land Services, Molong on (02) 6366 8505.

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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