NSW GOVERNMENT

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

NEW SOUTH WALES

ANIMAL HEALTH SURVEILLANCE

April – September 2022 » Issue 2022/2

Contents

Background to the NSW DPI-Local Land Services animal disease and pest surveillance program

The NSW DPI is obliged under the *Biosecurity Act 2015* to detect and manage notifiable animal disease outbreaks. This obligation is met by government veterinary officers being required to investigate potential notifiable disease outbreaks and unusual diseases that may be new, emerging or difficult to diagnose. They also conduct targeted surveillance projects, inspections of stock at saleyards and monitoring of compliance programs.

The desired outcome is the early detection of notifiable diseases, including exotics, and thus minimisation of negative impacts, and accurate, verifiable data on the animal disease and pest status of NSW. Reports are collated at the state level, for subsequent official reporting to the National Animal Health Information System (NAHIS), which is managed by Animal Health Australia. The NSW surveillance program is supported by Laboratory Services at Elizabeth Macarthur Agricultural Institute (EMAI) and by research staff who design and improve diagnostic tests and, working with field veterinarians, investigate the epidemiology of diseases that may have significant biosecurity impacts.

Quercus spp. poisoning in Steers

In May 2022, the District Veterinarian was called to investigate deaths in a mob of steers in the Central Tablelands.

The steers had been vaccinated with a 5-in1 clostridial vaccine prior to being introduced to the property three weeks prior to the visit. The steers were kept in a holding paddock close to the house on arrival and then moved to another paddock on the property after seven days.

Other mobs of steers had previously grazed this holding paddock with no reported problems. There was no known access to toxins on the property such as old sheds, discarded batteries, or dump sites. There were no known toxic plants in the paddocks where the steers had been grazing.

One week prior to the property visit, a steer had been found dead in a creek on the property.

Another steer was found dead near a creek on the property on the morning of the visit. It had been seen alive the night before. There was some clear froth from the nose of the steer.

Due to the sudden death of the steer, an anthrax ICT test was performed and found to be negative. The property was not within the typical NSW anthrax belt and there was no record of anthrax being diagnosed on the property.

A post-mortem revealed un-clotted blood, congested and overinflated lungs with interlobular air and intralobular emphysema. The liver had multiple, irregular, 1-3 cm diameter multifocal pale lesions extending from the parietal surface into the parenchyma. The rumen pH was 6, and some blue tarpaulin was found in the rumen contents. The small and large intestines were congested and filled with bloody contents. The kidney architecture was pale, and the cortex had red streaking perpendicular to the capsule. The urine was clear.

Samples sent to the Elizabeth Macarthur Agricultural Institute included fixed and fresh samples of liver, kidney, brain, heart, muscle, intestines (rumen, large and small intestinal sections), rumen contents, smears of the intestinal wall, aqueous humour, and urine.

The remainder of the steer mob was checked. One steer was separated from the mob and the rest appeared normal. The steer was down but got up when approached and could not be examined in the paddock. He was in lean condition and appeared weak when walking but caught up with the mob. The owners planned to take the steer to the yards. He was treated with oral electrolyte fluids and hay pending further results.

The laboratory confirmed a negative Anthrax result using Polymethelene Blue Stain on peripheral blood smears.

Lead and arsenic levels on fresh liver and kidney were within normal limits. The nitrate and nitrate levels were normal. Arsenic was tested because of the bloody intestinal contents. Lead was excluded due to the sudden death of the steer and the weakness observed in another steer.

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A profile of the aqueous humour was requested with the following result:

Sample	Test	Normal range	Results	
AH	Urea	2.1-10.7 mmol/L	53.8	High
AH	Glucose	<4.2 mmol/L	17.1	High
AH	BHB (ketones)	0.00-0.8mmol/L	0.20	Normal
AH	Ca	0.61-2.12 mmol/L	1.03	Normal
AH	Mg	0.61-1.61 mmol/L	0.74	Normal
AH	Ammonia	0-200 umol/L	220	High

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Elevated urea and glucose in the aqueous humour reflect hyperglycaemia (elevated blood glucose) and azotamia (elevated blood urea nitrogen) at the point of death.

Hyperglycaemia may be seen in cattle that are moribund or experiencing stress or fear.

Azotaemia can be due to prerenal, renal, or post renal causes. Pre-renal causes include dehydration and shock causing reduced renal blood flow, in these cases the urine should be concentrated. Renal azotaemia occurs when there is failure of more than three quarters of the nephrons. Where there is renal azotaemia, the urine concentrating ability is impaired. Post renal azotaemia results from obstruction of the urine outflow or leakage of urine from the urinary tract into tissue or body cavities. There was no evidence of renal obstruction or urine leakage in the steer.

Bovine diarrhoea Virus in the DNA of the steer using tail hair follicles (PACE test) was not detected. Fresh liver and kidney were tested for arsenic and lead levels and the levels were not elevated.

A PCR test for *Leptospira sp* was performed on the urine sample and fresh kidney and was negative.

Histological examination of the of the kidney revealed severe, diffuse and chronic tubulointerstitial nephritis. Occasional oxalate crystals were observed but not considered to be the cause of the pathology.

As a result of these findings, a search for plants capable of causing renal toxicity was conducted. The holding paddock was found to contain a large oak (*Quercus spp*). There had been many acorns on the oak that season with many on the ground as a result of recent storm activity. There were many oak saplings in the paddock that showed evidence of having been recently eaten by cattle.

Most species of oak (*Quercus spp*) are considered poisonous, and most animals are susceptible. Sheep and cattle are most often reported to be affected by this toxicity.

Signs associated with oak poisoning are observed 3-7 days after ingestion of saplings or green acorns. Mortality rates of up to 70% have been reported. There is often a period of feed restriction prior to the ingestion of the oak. In some reports a storm has preceded the event. Quercus or oak toxicity is infrequently reported in Australia but has been known to occur.

For further information, contact Lucienne Downs, District Veterinarian, Central Tablelands Local Land Services, Orange on 02 6363 7883.

Figure 1. Deceased steer with froth from the nose.

Foot and mouth disease exclusion in Angus heifers

The Bathurst district owner of a mixed consignment of 60 Angus heifers purchased 5 months prior reported that two died previously of unknown causes and another had recently deteriorated then died. In the recent case, the heifer deteriorated over several weeks before dying in late July.

The Angus heifer, approximately 12 months of age, was emaciated, with sunken eyes and a rough coat. There was dry crusty skin over both axillas and the inguinal region. There was moist dermatitis in skin folds, with a yellow exudate. There were numerous 0.5 to 1 cm healed ulcers, especially on dental pad.

While the provisional diagnosis was that this animal was persistently infected with pestivirus, a vesicular disease investigation was conducted due to the oral lesions. Samples submitted to the Australian Centre for Disease Preparedness (ACDP) at Geelong via the Elizabeth Macarthur Agricultural Institute (EMAI) were negative for Foot and Mouth disease and Vesicular Stomatitis. Samples were positive for Bovine Viral diarrhoea Virus confirming that this heifer was persistently infected with pestivirus.

For further information, contact Bruce Watt, District Veterinarian, Central Tablelands Local Land Services, Bathurst on 02 6333 2303.

Figure 2. The dead heifer was emaciated with a crusty dermatitis.

Figure 3. Shallow ulcers on the dental pad and dry crusty dermatitis on the skin of the face (and elsewhere).

Foot and mouth disease and lumpy skin disease excluded in beef cattle

In August 2022, the Maitland District Veterinarian (DV) was notified of one steer in a mob of 30 in the Cooranbong area that had circular epithelial plugs on its muzzle. The plugs fell out when the owner was walking the steer up to the yards, leaving 5-7cm deep holes. The producer said that only one animal was affected. The affected steer had increased salivation but no sign of lameness. The steer had lost condition over the last 2 weeks and had no noticeable lesions 1 week prior to the DV being contacted. The steer was isolated from the rest of the herd but was still eating well and did not appear to have any difficulty swallowing. The producer sent a photograph (Figure 4) to the DV prompting an emergency animal disease (EAD) investigation.

The Lower Hunter had been experiencing above average rainfall and there had been recent flooding in the area. This steer was in a mob of approximately 30 head that had been grazing a low-lying paddock with mixed native pasture for approximately 1 month. In total, the property had ~60 head mixed breed cattle. No other cattle were showing similar clinical signs.

No cattle were moved onto the property in the preceding months. There were no adjacent cattle and there was no known pig activity. The producer had no history of international travel, international visitors, or international mail.

The 15-month-old steer was lethargic and easy to handle. The muzzle had 5 circular lesions that varied in size from 0.5cm-5cm diameter and to a

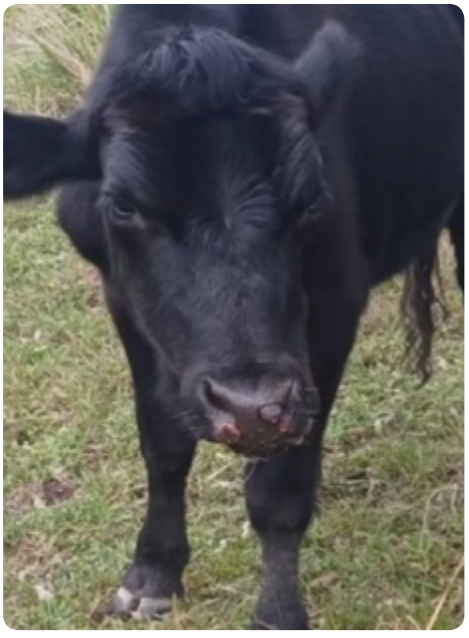

Figure 4. Photograph of affected steer showing circular necrotic plugs on the nose (taken by producer).

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Figure 5. Circular necrotic ulcers on the nose and lips of the affected steer.

Figure 6. Circular necrotic lesions on the nose.

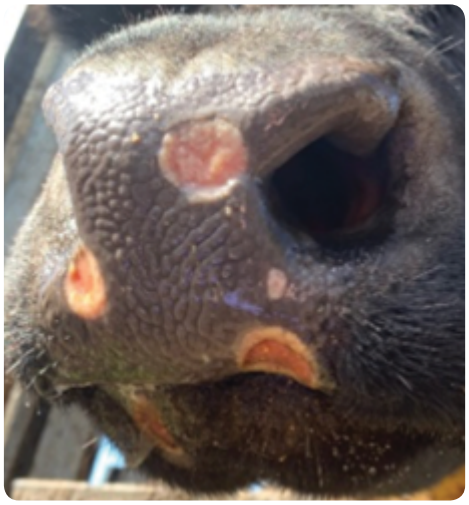

Figure 7. Healing lesions 3 weeks later.

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depth of approximately 5cm on the edge of the top lip. One of the circular lesions was on the bottom lip. There was a slight increase in drooling. There were no lesions on the tongue, gums, or dental pad. Slight gingivitis was present around the incisors. The tongue was soft and able to be pulled without any sign of discomfort. There were no lesions around the feet and no sign of lameness. The steer's temperature was 38.6°C and had a body condition score of 2.

Samples were collected for FMD and LSD exclusion as well as other potential differential diagnosis. The samples that were taken included mouth and nasal swabs in PBGS, blood serum and EDTA, a biopsy of the side of one of the ulcers, hair, and faeces. One of the epithelial plugs had been collected by the producer and stored bagged in the fridge. Half the epithelial plug was placed in formalin and half was kept fresh. Producers were advised to remain at the property and to not move any stock.

Results from samples sent by courier to the Elizabeth Macarthur Agricultural Institute (EMAI) were returned within 24 hours and excluded LSD and FMD. Infectious bovine rhinotracheitis (IBR), malignant catarrhal fever (MCF), vesicular stomatitis virus (VSV), and pestivirus were also excluded.

Blood results revealed a mild elevation in GLDH (260 U/L, Normal 0-30 U/L) and AST (279 U/L, Normal 0-129 U/L), indicating hepatocellular injury. Elevated GGT (64 U/L, Normal 0-35 U/L) indicated biliary injury or cholestasis. Fibrinogen and gammaglobulins were also elevated indicating acute or chronic inflammation.

Skin histopathology revealed dermal and epidermal necrosis which was coagulative, severe, diffuse and sub-acute with dermatitis, lytic necrosis and intralesional bacterial colonies. There were elements of both lytic and coagulative necrosis. Lytic necrosis is associated with inflammation and bacterial colonies, which most likely represent a secondary infection. However, some colonies are quite deep, so a primary role could not be excluded. Coagulative necrosis is unusual and can be seen with processes such as infarction or thermal/ chemical burn. This animal was not in contact with anything caustic or hot, so this can be ruled out.

The DV returned to the property 3 weeks after the initial visit to check the muzzle lesions and conduct a a follow up liver profile. GLDH and AST had decreased but the GGT remained high. A liver fluke antibody ELISA was positive (218 S/P ratio; 150 is a 'strong positive' for *Fasciola hepatica* antibodies). The lesions on the muzzle were healing well, the steer was eating well and put on condition. No other animals had shown any lesions.

The producer was not aware of liver fluke on his property, but the prevailing wet conditions from 2020 to 2022 in the Hunter have expanded liver fluke distribution in the region. It was recommended that the producer undertake a follow up liver fluke faecal sedimentation test on his herd to see if this animal had been introduced to the property with liver fluke, or if it was an issue on this property. Follow up faecal tests demonstrated liver fluke eggs in the herd.

A definitive diagnosis was not established in this case, but FMD and LSD were excluded along with MCF, IBR, VSV, and pestivirus. The epidermal and dermal necrosis produced large circular unusual lesions that could be mistaken as LSD. Lytic necrosis and deep bacterial colonies could have been related to the wet muddy conditions and coagulative necrosis of the dermis and epidermis could be related to emboli from migration of liver fluke larvae from the gut into the liver.

Liver fluke management on the property was discussed as part of an integrated parasite management approach featuring a mixture of strategic drenches, quarantine drenching cattle from liver fluke areas, and grazing management. Stock will be excluded from the swampy areas of the paddock, which up until this year has not been an issue.

For further information, contact Kylie Greentree, District Veterinarian, Hunter Local Land Services, Rutherford, on 02 4932 8866.

Avian influenza excluded in backyard hens

In late July, the owner of a small flock of backyard hens in Bathurst reported that one hen had died several days previously, and another was sick. Four Isa Browns had been obtained from a commercial poultry operation several months previously. The other four were heritage breeds. Only the Isa Browns were affected. The flock was fed on poultry mash and household scraps. The feed bins are wired off to prevent wild bird access.

One mature Isa Brown was examined on 29 July 2022. The hen had reasonable muscle cover over the sternum and pasty faeces on the cloaca. It sat in sternal recumbency and was unable to raise its head although it could right itself if placed on its side. The legs and wings were weak but had some tone and while there was no menace response the bird's eyes constricted with light.

The bird was euthanased and necropsied. A small free egg was found in the peritoneum and there was scant turbid yellow peritoneal exudate. While egg peritonitis was diagnosed grossly, samples were submitted to exclude notifiable diseases. Samples were negative for Influenza A virus, Newcastle Disease virus and *Chlamydia psittaci*.

For further information, contact Bruce Watt, District Veterinarian, Central Tablelands Local Land Services, Bathurst on 02 6333 2303.

Figure 8. The affected bird was weak and unable to raise its head.

Figure 9. Egg peritonitis.

Lumpy skin disease exclusion in trade cattle

In September, a District Vet visited a property in the Central Tablelands to investigate steers in poorer condition than their herd-mates with multiple lumps over their bodies. The mob of 40 Angus and Angus cross steers were purchased from southern Queensland, via the local saleyards, one month before to the visit. On arrival, the steers were inducted with a 5-in-1 vaccination, ADE injection and an injectable anthelmintic.

Five animals with skin lumps and in poor condition were pulled by the producer for examination. All five animals had multiple 30-40 mm diameter raised lumps in the skin over the left-hand side of the neck, from behind the ear to over the shoulder. Some lumps had a central scab present, others had intact skin. The steers were in BCS 2/5. Three had minor tear staining and crusting of the eyes. Rectal temperatures ranged from 38.7-39.3°C. However, they were yarded without shade for a few hours prior to examination.

Fine needle aspirates were performed on a random selection of lumps from each animal. A flocculant, white to cream fluid was aspirated from most lumps. Three lumps did not yield a sample. Given their previous location in Southern Queensland, serum, EDTA whole blood, and Lithium Heparin whole blood samples were taken from all five animals. These samples were submitted to the Elizabeth MacArthur Agricultural Institute and the Australian Centre for Disease Preparedness for a low-risk lumpy skin disease exclusion. These samples were negative on both antigen PCR and antibody ELISA.

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Additional history from the producer revealed that the needle used to vaccinate the cattle had not been changed in the last two years, and that there is minimal to no disinfection between animals. Based on this, and the pus aspirated from many of the nodules, a diagnosis of vaccination site abscessation was made. The producer was advised to implement regular needle changes when injecting, as well as ensuring disinfection, either with methylated spirits or chlorhexidine, occurs between animals to minimise the risk of infection spread between animals, as well as introduction of skin bacteria into the tissue below the skin.

This case describes an Emergency Animal Disease exclusion with laboratory confirmation. The alternate diagnosis of vaccination abscessation is a relatively common finding in commercial cattle, requiring trimming of the carcase and loss of carcass weight. This can be prevented by frequently changing needles, injecting vaccines subcutaneously and disinfecting the needle between animals. Lumpy skin disease is an exotic viral disease of cattle and buffalo that causes significant weight loss and irreparable damage to hides. It is vector borne, spread by blood eating insects. This complicates control. Hence, early diagnosis is an important part of an effective response.

For more information contact Rhys Powell, District Veterinarian, Central Tablelands Local Land Services, Orange on 0428 710 002.

Yersiniosis causing stillbirths in maiden ewes

In August 2022, the owner of a mixed farming property near Inverell, NSW, noticed a high number of stillborn lambs over the first five days of lambing in maiden ewes. These lambs appeared to be full term with no notable external abnormalities. The producer runs 5000 sheep, with 1150 Dohne maiden ewes. They were joined with Dohne rams for seven weeks and started lambing on schedule on 7 August 2022. The ewes had been grazing improved pastures however, two weeks prior to lambing, were moved onto an oat crop and had access to commercial mineral lick blocks. The ewes themselves appeared to be in excellent health.

Earlier the same month, the older Dohne ewes were seen for a small proportion of the flock scouring and progressing to death, despite internal parasite treatment and nutritional supplementation. They were diagnosed with Yersiniosis, with faecal cultures positive for both *Yersinia pseudotuberculosis* and *Yersinia enterocolitica*.

Initially, one stillborn lamb was presented for examination on 12 August 2022. On post-mortem examination there were no significant findings. Upon histological examination there was mild, multifocal, acute, suppurative pneumonia; and minimal – mild, multifocal, acute hepatitis. On brain examination, congestion of the cerebrum and brainstem, with midbrain and brainstem vacuolation, which was noted to resemble myelinic oedema but with unknown cause.

Sterilely collected foetal abomasal fluid cultured mixed bacteria, with *Yersinia* then cultured. Furthermore, the liver was cultured with a pure, profuse growth of *Yersinia enterocolitica*. *Campylobacter* culture was negative and there was no evidence of toxoplasmosis on histological examination.

An additional stillborn lamb and placenta were examined on 25 August 2022. The placenta was grossly affected with approximately one quarter having visible changes affecting both cotyledons and the amnioallantois. There were multiple, well demarcated areas of light yellow discolouration, and thickening of the membranes; when transected these were full thickness with a granular density to the tissue. The affected area was centred around the cervical area, however dispersed over the body of the membranes.

Histologically in the cotyledon there was severe, multifocal to focally extensive, chronic, active, suppurative and histiocytic placentitis with interstitial oedema, vasculitis, and thrombosis.

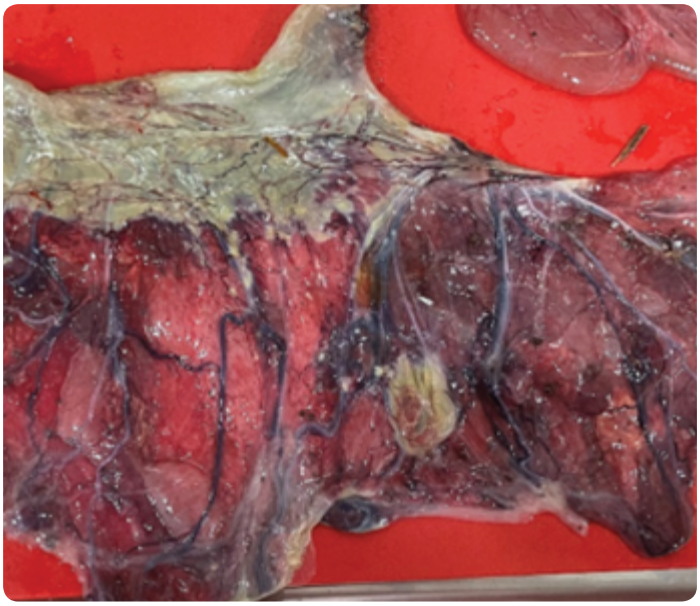

Figure 10. Affected placenta showing discolouration and thickening of membranes.

This lamb again had no abnormalities detected externally. On post-mortem examination there was moderate, diffuse erythema of the small intestine. Also diffuse, mottled dark red discolouration over the entirely of the lung tissue.

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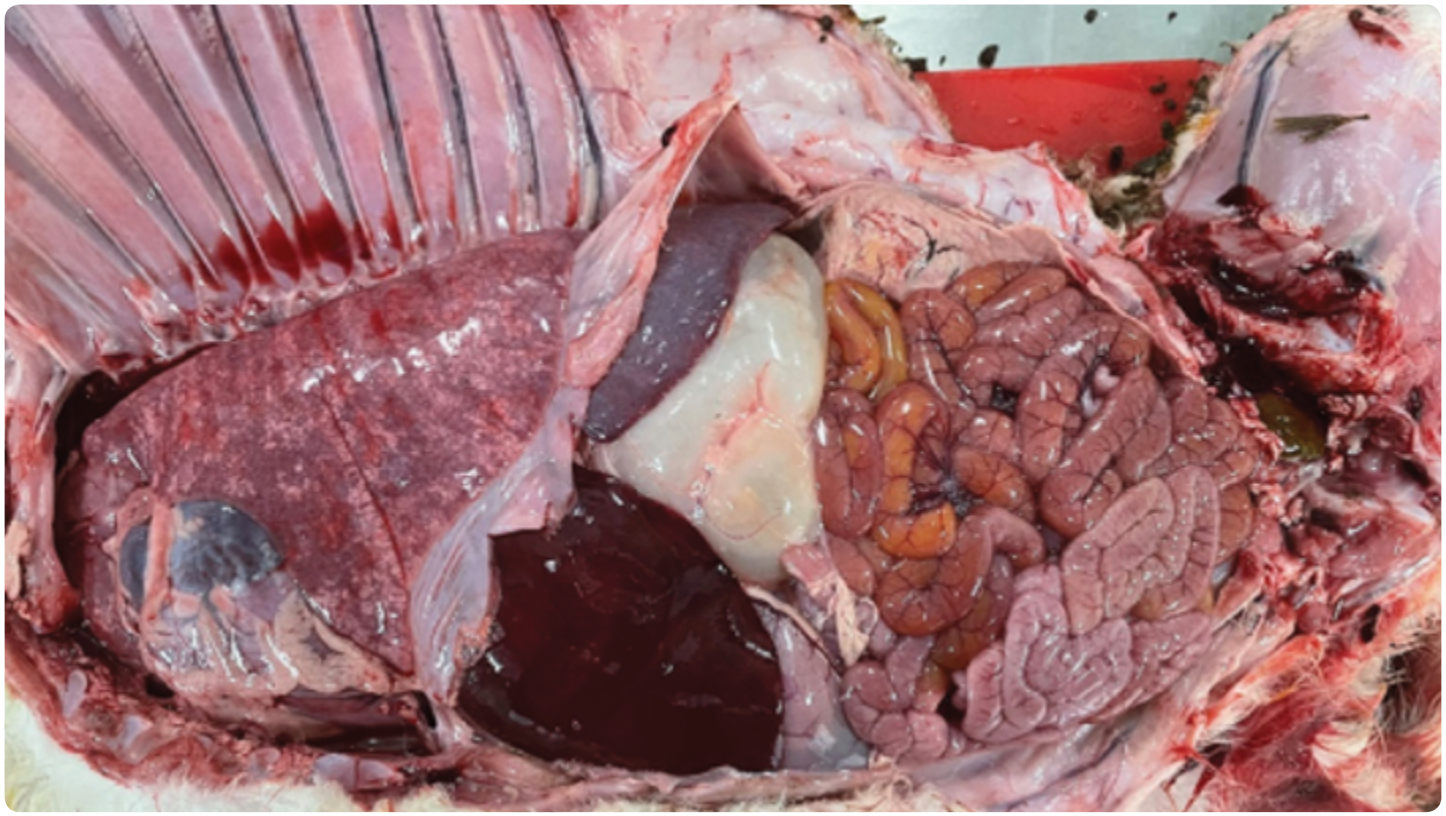

Figure 11. Affected stillborn lamb showing discolouration of the lung tissue.

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On histological examination of the lung there was marked inflammation with chronic, active, severe, diffuse, histiocytic and suppurative, bronchiointerstitial pneumonia. While the brain looked clinically normal, the cerebrum was histologically affected with mild inflammation, and examination showed meningioencephalitis which was mild, multifocal, lymphohistiocytic, with chronic gliosis.

Yersinia pseudotuberculosis was cultured from both the placenta and the lamb's abomasal contents. *Campylobacter* culture was negative and there was no evidence of *Toxoplasma* infection on histopathology.

The second set of samples returned a diagnosis of *Yersnia pseudotuberculosis* causing a suppurative and histiocytic placentitis and bronchointerstitial pneumonia, and a lymphohistiocytic meningoencephalitis.

Yersinia pseudotuberculosis and *Yersinia enterocolitica* are gram-negative coccobacillus which cause disease in a variety of animals and are a recognised zoonoses. *Yersinia* spp. most commonly cause enteritis, with greater infections detected in wet winters, in affected sheep. This correlates with the recent diagnosis of *Yersina* scours on this property, during an unseasonably wet winter.

While *Yersina* has been documented to cause sporadic cases of abortion in sheep, this is quite uncommon.

Yersina spp. are commonly identified in Australian sheep flocks, without having to be causing sub-clinical or clinical disease. Both *Yersinia pseudotuberculosis* and *Yersinia enterocolitica* are environmental pathogens and ubiquitous in livestock. It is possible that, due to the higher environmental contamination from faecal shedding in the older ewes, combined with the poor weather conditions, that there was a greater population of *Yersina* in the environment. This larger population increased the likelihood of further animal infection. The cold, wet weather periods, reduced nutrition over winter, plus the additional needs of pregnancy on the ewe, increase the animal's stress and make them more susceptible to *Yersina* infection.

For further information, contact Meg Parsons, District Veterinarian, Northern Tablelands Local Land Services, Glen Innes on 0400 754 360.

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 Biosecurity and Food Safety unit on 1800 684 244.

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*

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

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Copies of NSW Animal Health Surveillance reports are available on the internet at:

www.dpi.nsw.gov.au/about-us/publications/animal-health-surveillance

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JN 18071 05/22