NSW GOVERNMENT

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

NEW SOUTH WALES

ANIMAL HEALTH SURVEILLANCE

July– September 2019 » Issue 2019/3

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.

NSW Anthrax Report July – September 2019 (Q3)

By Barbara Moloney

There were no anthrax incidents during the quarter.

Fifty-three mortality investigations during the quarter had anthrax excluded as the cause of death. Thirty-seven of these involved cattle with alternative diagnoses including bloat, clostridial infection, hypocalcaemia, pneumonia and nitrate toxicity.

Fifteen investigations involved sheep and alternative diagnoses included clostridial infection, hypocalcaemia, lactic acidosis and nitrate toxicity. There was also one mortality investigation in an alpaca with no alternative diagnosis.

The immunochromatographic test (ICT) gave negative results in 30 of the cattle investigations. Nine of these were confirmed by laboratory testing. The remaining seven cattle investigations without ICT were confirmed negative by laboratory testing alone.

Thirteen of the sheep investigations were negative on ICT and six of these were confirmed by laboratory testing. Two of the sheep investigations were negative by laboratory testing only.

The alpaca was diagnosed as negative with ICT alone.

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

Infectious laryngotracheitis in NSW chickens

By Jenna Fraser

For the third quarter of 2019, (July-September), a total of 65 infectious laryngotracheitis (ILT) notifications were received by NSW DPI. Of these, 22 were suspected cases, and 43 were confirmed cases of ILT. Similar reports were collected in Q1 and Q2 (50 and 65 cases respectively).

ILT is an endemic, notifiable disease of poultry in NSW. It is a highly contagious respiratory disease of chickens caused by gallid herpesvirus 1. The virus can also infect pheasants, partridges and peafowl. The virus occasionally infects turkeys, ducks or wild birds; however, it does not affect parrots or pigeons. Farm biosecurity is crucial in stopping the introduction and spread of ILT within a flock.

Clinical signs include dyspnoea, gasping, coughing of blood and mucus, sinusitis, nasal discharge, ocular discharge and reduced egg production. Birds can die of suffocation if the disease is severe. ILT is characterised by inflammation, ulceration, haemorrhaging and a build-up of a diphtheritic membrane which can be observed by examination of the larynx of affected birds. There is marked variation in the pathogenicity of various virus strains. Three major forms are known, peracute, subacute, mild or chronic forms. Outbreaks of ILT in Australia associated with vaccine strains of ILT (classes 1 and 7) are usually of the subacute form and occasionally the mild or chronic form. Outbreaks of ILT associated with "wild" or "field" strains of ILT virus in Australia (classes 2 to 6, and more recently classes 8 and 9) are usually severe and highly pathogenic (peracute form of ILT).

Diagnosis of ILT is based on a clinical history of a sudden outbreak of significant respiratory disease, typical clinical signs, post-mortem examination and laboratory testing to isolate the virus. No treatment for the disease is available. Antibiotics to control secondary bacterial infection may be warranted in some cases.

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Three commercial attenuated vaccines are available in Australia: MSD Nobilis ILT (MSD, Serva ILT vaccine strain, Class 7 virus), Poulvac Laryngo A20 (Zoetis, Class 1 virus) and Poulvac Laryngo SA2 (Zoetis, Class 1 virus). There is no multivalent ILT vaccine in Australia, and the simultaneous use of multiple ILT live attenuated vaccines should be avoided as this practice increases the risk of viral recombination.

Two relatively new and highly pathogenic, "wild" or "field" genotypes of ILT virus in Australia are classes 8 and 9. These two viruses were the cause of significant outbreaks of ILT in commercial poultry between 2007 and 2009. They were found to have emerged as a result of recombination between the previously existing live vaccine strains (Class 1 viruses) and the Serva ILT vaccine strain (Class 7 virus), which was introduced into Australia in 2007.

There is no cross-protection between the two distinct vaccine lineages (Class 1 and Class 7) in poultry that are vaccinated against ILT. However, there is some cross-protection between the vaccine strains (Classes 1 and 7) and the field strains that have caused outbreaks in Australia (classes 8 and 9). If vaccination of a flock is being considered, an important factor to take into account is the most common ILT strain being isolated from flocks in the local area.

In NSW, two major outbreak clusters of ILT occurred in this quarter. The largest ILT outbreak cluster was in the Griffith region (44.2% of all confirmed cases), with the next largest outbreak cluster in the Tamworth region (40.9%). Both of these outbreak clusters were caused by ILT virus Class 7. The outbreaks were subacute in nature and affected commercial chicken meat production farms.

Three unrelated cases of ILT were also detected in the Sydney region (7.0%) during this quarter. The first case involved commercial layer hens infected with Class 9 ILT virus, the second case affected backyard layer hens (ILT Class not specified), and the third case was detected in commercial meat chickens infected with ILT virus Class 7.

Isolated cases of ILT were also detected in the regions of Casino (show chickens), Gloucester (show chickens) and the Central Coast (backyard layer chickens).

For further information contact Jenna Fraser, Veterinary Policy & Project Officer, NSW DPI Animal Biosecurity, Paterson NSW on (02) 4939 8940.

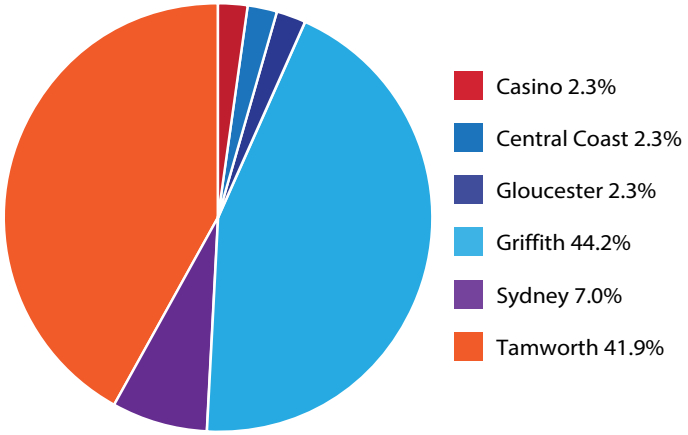

Figure 1: Confirmed cases of ILT in NSW (Q3 2019). Graph by J. Fraser.

Figure 2: A broiler chicken with its neck extended and head raised whilst coughing and gasping. These clinical signs are consistent with ILT. Photo by R Reece.

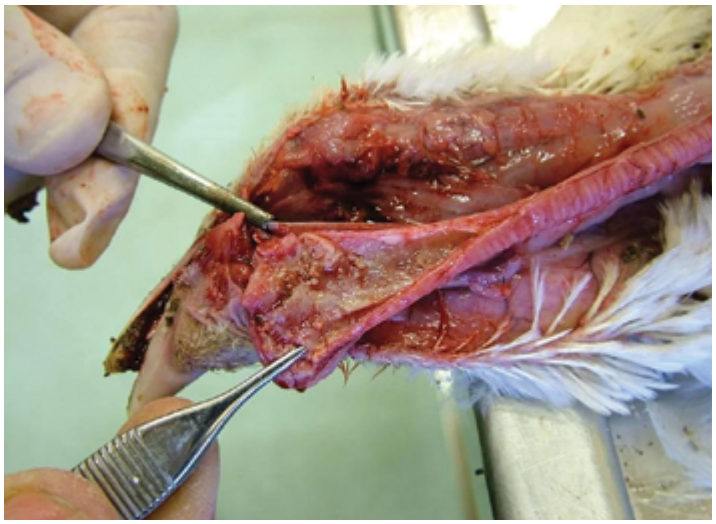

Figure 3: On post-mortem examination of chickens affected by ILT the larynx and trachea may be ulcerated and haemorrhaging and is sometimes blocked by a yellow caseous exudate. Plugs of mucus and/or clotted blood in the larynx and trachea can cause partial or complete respiratory obstruction.

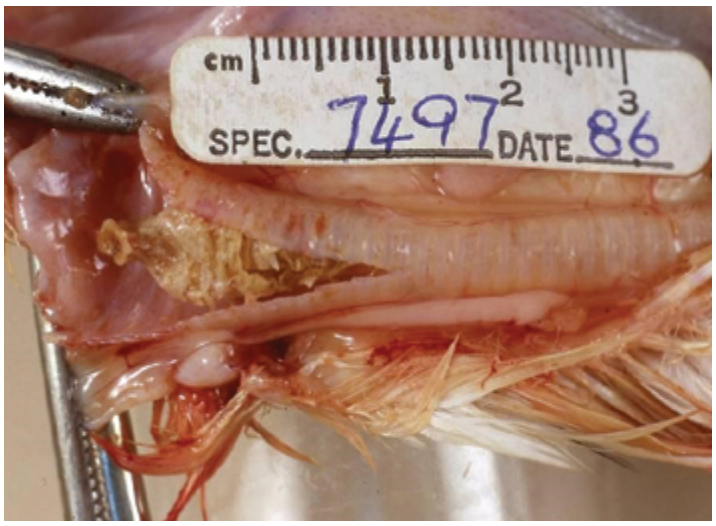

Figure 4: Post-mortem examination of a broiler chicken during an outbreak of highly pathogenic ILT in 1986. The trachea is occluded by a crusty, caseous exudate attached to the tracheal mucosa.

Foot and mouth disease (FMD) exclusion in weaner cattle

By Henry Clutterbuck

The manager of a cattle property in the NSW Southern Tablelands reported deaths in a mob of mixed-sex weaner black Angus cattle in the first week of July 2019. The weaners had been dying at a rate of 1-3 head per week for the proceeding two weeks (four dead in total) with no change to the management practices. The stock had been weaned three weeks prior having been taken off drought-stressed dams. Complete courses of 7-in-1 (two injections 4-6 weeks apart) and Bovilis MH were given to each animal at weaning. The weaners were then put on good quality pasture with supplementary hay.

At the initial visit, two animals were isolated and available for examination. They presented with increased respiration rates, elevated temperatures (40.1°C & 40.2°C) and increased lung sounds (crackles and wheezes) were auscultated bilaterally. Some other animals were heard coughing. The manager commented that all affected animals had presented with nasal discharge prior to death, with death occurring within 1-5 days of onset of signs.

No animals were available for post-mortem at this time. Blood and nasal swabs were collected and submitted to Laboratory Services at Elizabeth Macarthur Agricultural Institute (EMAI). The samples were tested for infectious bovine rhinotracheitis (IBR). The results returned a negative diagnosis. Whilst waiting for the results affected cattle were treated with antibiotics (Tetracycline) and anti-inflammatories (Meloxicam). Response to this treatment regime was positive, with no further cases reported over a three week period.

In the last week of July, the manager reported that three more weaner calves had died. Several animals in the mob had haemorrhagic diarrhoea and mucoid oral and nasal discharge. Physical examination of the recently deceased animal by the District Veterinarian revealed ulceration along the oral and nasal mucosa. A post-mortem was also conducted. The oral mucosal membranes were ulcerated. The gastrointestinal tract was inflamed throughout, with sloughing of the oesophageal lining (Figure 1). The colon and rectum were full of haemorrhagic diarrhoea. Both the liver and kidneys were extremely friable. There was no obvious gross lung pathology. Two live animals were also examined as they had oral and nasal ulceration (Figure 2 & 3)

Given some of the clinical manifestations, FMD was considered as a possible differential diagnosis, and appropriate samples were collected and submitted to EMAI; along with tissues collected on post-mortem. All samples submitted were negative for FMD. IBR and pestivirus testing were completed after the initial negative FMD diagnosis, which resulted in a negative result for IBR and positive on serum for pestivirus antigen. A diagnosis of mucosal disease due to pestivirus was made.

Mucosal disease occurs when a persistently infected (PI) animal is reinfected with a second cytopathic strain of pestivirus similar to the original virus strain. This similarity prevents the immune system being able to recognise a novel infection resulting in mucosal disease.

The manager was advised to ear notch all animals on the property to identify PIs and cull those animals. Testing any introduced breeding animals along with a vaccination program were recommended.

For further information contact Henry Clutterbuck, District Veterinarian, South East Local Land Services, Goulburn on (02) 4824 1910.

Figure 1: Sloughing of the oesophageal lining. Photo by H Clutterbuck.

Figure 2: Mucosal ulceration. Photo by H Clutterbuck.

Figure 3: Mucosal ulceration. Photo by H Clutterbuck.

Interstate collaboration leads to prompt exclusion of vesicular disease

NSW DPI and Agriculture Victoria

Government veterinary officers regularly conduct exclusions of exotic diseases of animals. This report highlights the collaboration between the Australian Government Department of Agriculture, Agriculture Victoria, Local Land Services (LLS) and NSW DPI to conduct a vesicular disease exclusion. Vesicular diseases include foot-and-mouth disease (FMD). A multistate outbreak of FMD is estimated to cause revenue losses up to $51.8 billion.

A consignment of nine dairy cows arrived at an export abattoir in north-central Victoria on 30 July 2019. On antemortem inspection, the Australian Government Department of Agriculture On-Plant Veterinarian (OPV) reported clinical signs of salivation, lameness and 'bleeding between the toes' in all nine animals. The OPV was concerned that the cattle might have had FMD and notified Agriculture Victoria.

Agriculture Victoria staff were immediately sent to the site. A veterinary officer inspected the cattle and reported moderate lameness in five cows with lesions predominantly affecting the hind feet. The degree of salivation was mild (limited to some froth around the muzzle). The cows did not appear systemically unwell.

The national vendor declaration (NVD) for the consignment identified that the cattle came from a property in New South Wales. The Victorian Chief Veterinary Officer (CVO) contacted the Australian CVO and the New South Wales CVO, and NSW DPI was notified of the traceback.

Given the highly infectious nature of FMD, it's expected that if FMD were the cause of the signs observed at the abattoir, there would be many affected cattle on the property of origin. Before the results of the Agriculture Victoria inspection were available, the New South Wales CVO contacted the Murray LLS, who tried to call the farm manager. Phone calls to the farm manager were unanswered, so LLS sent a staff member to visit the property. The farm manager called shortly before the staff member arrived. Through phone contact, the LLS found no reason to believe that FMD was the cause of the signs observed.

The cattle were slaughtered at the end of the processing line, and the feet and mouths of each carcass were examined more closely. The foot lesions were not vesicular in nature and appeared erythematous (similar to a bacterial pododermatitis) (Figure 1). Lesions affected the skin above the coronary band, between the digits and around the dewclaws (Figure 2 and Figure 3). A single oral lesion was observed in one animal, appearing as a small erosion of the dental pad that was not vesicular in appearance.

Oral and foot lesion swabs were collected into viral transport medium. Samples were submitted to the CSIRO Australian Animal Health Laboratory, Geelong, for vesicular disease exclusion. Testing included FMD, swine vesicular disease, vesicular exanthema, vesicular stomatitis and senecavirus A.

The CSIRO Australian Animal Health Laboratory delivered the test results the following morning, which confirmed negative for FMD and other vesicular diseases on polymerase chain reaction (PCR) assay and antigen enzyme-linked immunosorbent assay (Ag-ELISA).

Subsequent testing at AgriBio, Bundoora, didn't identify a causative agent. Test results for qPCR for bovine herpesvirus type 1 (BHV-1), pan-pestivirus and parapoxvirus were all negative.

The best way of protecting Australian livestock from exotic diseases is to prevent entry to Australia. If FMD were introduced to Australia, prompt detection would be critical to minimise its impact. In this case, the OPV immediately reported the concern to the local veterinary officer but could also have contacted the Emergency Animal Disease Hotline. This resulted in immediate action by Agriculture Victoria. Traceability via an NVD and the National Livestock Information System enabled the source property to be identified immediately. By the afternoon after the concern was raised, the antemortem inspections and necropsies in Victoria and the New South Wales farm-of-origin investigations gave substantial evidence the cause of the clinical signs was not a vesicular disease. This was confirmed as negative the following morning.

We'd particularly like to acknowledge Megan Scott and Karin Morgan, Agriculture Victoria, for providing details of the Victorian investigations. The prompt work of 18 people ensured this multiagency investigation was completed quickly.

For more information, contact Graham Bailey, Senior Veterinary Policy & Project Officer, NSW DPI Animal Biosecurity on 02 6391 3455.

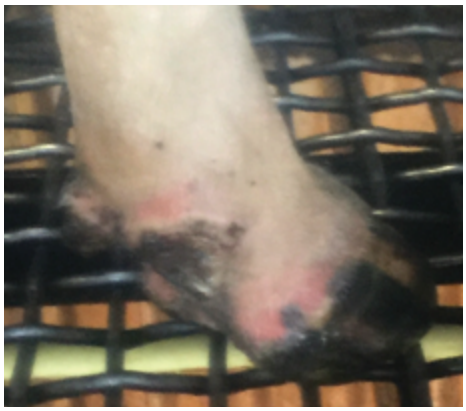

Figure 1: Erythema of the skin above the coronary band, between the digits and around the dew claws. Image by K. Morgan.

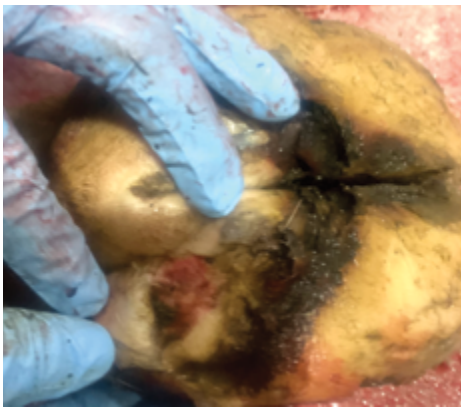

Figure 2: Palmar view of the hoof with erosion of the periople of the heel with a tag separated from the underlying corium. Image by K. Morgan.

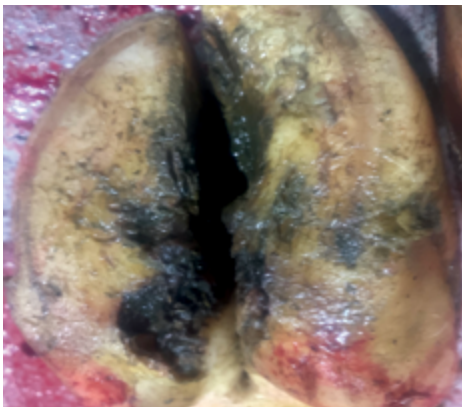

Figure 3: Plantar view of the sole. Multiple erosions with generalised erythema of the periople of the heel. Image by K Morgan.

Drought influenced lead exposure investigations

By Cathie Savage

The lack of available pasture due to the drought has possibly led to livestock being more interested in rubbish on farms (such as old batteries), breaking through fences to paddocks with more feed as well as producers looking for alternative sources of feed. Lead exposure investigations have been required due to these issues, with two such investigations discussed below.

Investigation 1.

Lead poisoning was diagnosed in September 2019 on a property in NSW. This occurred concurrently with an outbreak of pneumonia in a mob of weaner/yearlings grazing a failing oats crop and an adjacent bare, drought-affected pasture paddock.

Sudden death was the first sign of illness seen. The first death was unreported. Three days later a second animal died, and a post-mortem showed gross signs of pneumonia. Examination of the reticulum found no lead. Inspection of the rest of the mob in the paddock found cattle coughing and with nasal discharge, signs consistent with pneumonia. The mob was treated with antibiotics, assuming *Histophilus* infection. Inspection of the paddock, which was leased and relatively unknown to the producer, revealed no obvious lead sources. The animals were yarded every few days for treatment and monitoring. Around this time, the dam also ran dry, and a new water trough was installed near the cattle yards. The yards were located in a corner of the bare pasture paddock, and prior this the cattle had not been known to frequent this section of the paddock. Ten days after the first post-mortem, a second was conducted on an animal observed ill and with a nasal discharge the previous day. This revealed similar gross finding to the first post-mortem.

Twelve days after the first post-mortem one animal showed neurological signs. This animal was assumed to have the neurological form of *Histophilus* and was treated with antibiotics but died two weeks later.

Around the same time, another heifer started to show neurological signs. This heifer, along with another heifer displaying respiratory signs of nasal discharge and coughing, had blood collected. Following the visit by the District Veterinarian (DV), the producer once again inspected the area near the cattle yards and new water point and found a half-buried cap of vehicle battery with no obvious cattle disturbance. As a result, blood lead testing was requested and revealed both animals were lead affected. Blood samples from the remaining nine animals in the mob, including another animal showing neurological signs, were tested for lead. Eight out of the eleven cattle were lead affected. The results for the heifers and one mature steer showing clinical signs of lead toxicity ranged from 2.75 - 3.32µmol/L. The results for those cattle that were lead affected but not showing clinical signs ranged from 0.25 - 1.78 µmol/L. The reporting pathologist commented that poisoned animals usually have concentrations greater than 1.7µmol/L.

Further inspection to the area revealed more battery plate fragments around the site where an old vehicle had previously been located and signs that cattle had been licking through the soil. The new water trough and requirement for yarding for antibiotic treatment had unwittingly caused the cattle to frequent the lead-contaminated area. This area was then fenced off, and later the DV advised that the area needed to be cleaned up and the contaminated soil buried.

As soon as the lead exposure was diagnosed, the producer informed the DV that 14 older cattle had been sold a couple of days prior to the diagnosis. These cattle had the same potential access to the lead source. It was confirmed no other cattle had access to the lead source. The 14 cattle were traced 12 days after leaving the property to five different Property Identification Codes (PICs), three of which were abattoirs. Two cattle sent to a NSW abattoir had been slaughtered, the carcases were able to be held and tissue testing revealed lead levels were less than the Maximum Limit. NSW Food Authority agreed that these carcases could be released. The stock that had been sent to abattoirs in Queensland and Victoria required tracing by those jurisdictions. Six cattle were sent to a feedlot in NSW. These were blood tested and three were lead affected and were returned to the property of origin. One animal ended up on another property; this was tested and was not lead affected.

The management of lead residues, in this case, involved the collaborative effort of three jurisdictions, two Local Land Services (LLS) regions, three LLS DVs, three abattoirs and three NSW producers who all cooperated to ensure lead residues didn't enter the food chain, helping to ensure food safety. It is a timely lesson that when producers are leasing land they should make sure they are aware of possible sources of residues on the property.

Investigation 2.

A second case of lead exposure occurred in July 2019 when a producer with cattle and sheep on a small property with limited pasture due to the drought allowed his livestock to access a neighbouring derelict mine site with lots of natural grass. Crown Lands notified LLS that the cattle were on the site which is contaminated with a number of heavy metals. LLS and DPI worked with Crown Lands, the Department of Planning, Industry and Environment (DPIE) Resources and Geoscience and the Commonwealth to determine which heavy metals posed a risk for residues in the livestock, based on soil test results from 2015. Lead and arsenic were the metals that posed the highest risk. No livestock were showing clinical signs of lead or arsenic poisoning. An Individual Biosecurity Direction was issued to clean graze the animals for at least 48 days (as per historical arsenic management advice) while further investigating for residues.

The cattle were blood tested initially, revealing that 12 out of 30 were lead affected. The sheep had not been observed grazing on the mine site; however, given the cattle results and the fact the sheep had the same potential access to the mine site, they were also tested. This revealed 30 out of 33 with blood lead levels >0.24µmol/L. Following consultation with other jurisdictions managing lead exposure cases

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in sheep the 'Lead affected food-producing animals in New South Wales' procedure was used to manage the sheep, with modifications as abattoir do not routinely scan Radio Frequency Identification Devices (RFIDs) on sheep in NSW as RFIDs are not mandatory in sheep in this state. This case is ongoing with the different species and age groups being managed in consultation with the producer taking into account the current drought conditions and their future plans for the property. This case again highlights the risk of grazing animals on land where the level of chemical or natural contamination is unknown.

The latest version of the 'Lead affected food-producing animals in New South Wales' can be found at: **https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/722853/Lead-affected-food-producing-animals-in-New-South-Wales.pdf**

For further information contact Cathie Savage, A/Senior Veterinary Policy & Project Officer, NSW DPI Animal Biosecurity, Orange NSW, on (02) 9842 8091.

Anthrax excluded in Merino wethers fed DDG pellets

By Jess Bourke

A sheep producer in the NSW Central Tablelands contacted a District Veterinarian in August 2019 to investigate a mortality event of 56 merino wethers, that were found several days after death. The mob of 883 wethers had been trail fed dried distiller's grain (DDG) pellets for the first time at a rate of 400g per head eight days prior to the deaths being discovered, then 800g per head four days prior to the deaths being discovered. No hay and minimal pasture were available.

On arrival, the carcases were all at the same stage of decomposition, and some had bloody discharges from the eyes, nares and anus. They appeared to have died quietly without struggling. Bloody discharge from one animal tested negative with an Anthrax immunochromatographic test (ICT). Anthrax was considered an unlikely differential due to the property's location outside of the anthrax belt. Aqueous humour was collected from three carcases (wethers 1, 2 and 3). A post-mortem was performed on a single unwell wether, despite concerns that this lamb's condition was not representative of the problem. This wether (wether 4) had a rumen pH of 6 (normal 6.8-7.0), its ruminal epithelium sloughed easily (Figure 1), and the remainder of the examination was unremarkable.

At this point, a presumptive diagnosis of lactic acidosis was made, and the manager advised to feed hay. Proper induction to concentrate diets was discussed.

The following day, two wethers from another mob of 1000 were found freshly dead. This mob had recently been trail fed with DDG pellets. A post-mortem was undertaken on both of the recently dead wethers. The first wether (wether 5) had significant ruminal epithelial sloughing and inflammation, and the rumen pH could not be read. The second wether (wether 6) had minimal rumen changes apparent grossly and a rumen pH of 5.5.

Anthrax was excluded at Laboratory Services at Elizabeth Macarthur Agricultural Institute (EMAI) by the polychrome methylene blue stain on three aqueous humour and a body fluid sample.

Of the three decomposed sheep (wethers 1-3), two had elevated D-lactate and all had elevated ammonia and urea in aqueous humour. Wether 4 had histological evidence of chemical rumenitis with subsequent lesions in the liver and kidney, although D-lactate was within normal limits. Wether 5 had elevated aqueous humour ammonia and urea. Wether 6 had elevated D-lactate and histological evidence of acute chemical rumenitis. There were no significant brain lesions, and epsilon toxin assay was negative, making a diagnosis of enterotoxaemia unlikely.

	Wether 1	Wether 2	Wether 3	Wether 4	Wether 5	Wether 6
D-lactate (0.0-0.5mmol/L)	1.7	*	2.0	0.0	0.1	2.6
Histological evidence of acidosis				yes	no	yes

The pellets were tested and had a Metabolisable Energy (ME) of 13.1MJ/kg MD and crude protein of 20.7%. The pellets were 15% starch. Although DDG is generally considered a safer energy source compared to cereal grains, the highly processed starch used to bind the pellets is rapidly fermentable and increases the risk of acidosis.

The diagnosis of ruminal acidosis was clear in four of the six animals sampled (elevated D-lactate and/or histological evidence of rumenitis).

It was hypothesised that protein toxicity may have played a role in the death of some animals; however, there was insufficient evidence to support this conclusively.

In total there were 80 deaths attributed to this event. Since the incident, the manager has been feeding hay to the affected mobs, and hay and lupins to the other unaffected mobs, and there have been no further mortalities reported.

For further information, contact Jess Bourke, District Veterinarian, Central Tablelands Local Land Services, Mudgee on 0417 803 685.

Figure 1: Sloughing of the ruminal epithelium of wether 4. Photo by J Bourke.

Ill-thrift and wastage in ewes caused by urolithiasis and lupinosis

By Katelyn Braine

A sheep producer in the Riverina contacted the local District Veterinarian (DV) about ill-thrift and wastage in a flock of lactating ewes in August 2019. The flock consisted of 400, mixed-aged, composite ewes. The ewes started lambing on 15 June 2019 and finished around the 20 July 2019. The ewes were drenched for intestinal parasites and vaccinated against clostridial diseases pre-lambing. Since early May the ewes had been grazing wheat, and up to the point of lambing, they were fed supplementary barley grain. A calcium, magnesium and salt mineral lick was provided ad libitum prior to lambing and throughout lactation. The producer reported that there were around six affected ewes. Apart from ill-thrift and loss of condition, there were no other clinical signs noted by the producer. The average body condition score (BCS) of the healthy portion of the flock was 2.5-3.0 out of 5. The lambs had been marked and were in good condition.

Post-mortems were performed on two affected ewes. One ewe was three years of age and had a set of twins at foot. The post-mortem of the second ewe was performed nine days after the first ewe to confirm if the laboratory findings of the first ewe were consistent or an incidental finding. The second ewe was five years of age and had a single lamb at foot. Both ewes had a BCS of 1.5 out of 5 and presented in sternal or lateral recumbency. The post-mortems of both ewes were consistent and revealed pale kidneys and mild thickening of the distal small intestine.

Samples were collected and sent to Laboratory Services at Elizabeth Macarthur Agricultural Institute (EMAI). Due to the age of the affected ewes, the loss in condition, no history of use of the Gudair vaccination, and the producer's concern for Ovine Johne's Disease (OJD), blood, ileocecal and intestinal samples were submitted to rule out the presence of OJD. Histopathology, as well as biochemistry and haematology profiles were performed on samples from both ewes.

In the first ewe, the Johne's Disease serology (AGID) was negative. Histopathology of the small intestine and large intestine showed mild chronic-active enteritis and colitis but no histological evidence of OJD. The histopathology of the kidney showed acute tubular injury, which was diffuse, moderate, sub-acute to chronic with intratubular protein and mineral deposits (urolithiasis). The mineral present was suspected to be struvite crystals. The serum biochemistry profile revealed marked elevations in urea (83.8 mmol/L, ref. 2.9-7.1 mmol/L) and creatinine (469 mmol/L, ref. 0-265 mmol/L), as well as hyperphosphataemia (6.58 mmol/L, ref. 1.13-2.58 mmol/L), hypermagnesaemia (1.75 mmol/L, ref. 0.74-1.44 mmol/L), and hypocalcaemia (1.56 mmol/L, ref. 2.12-2.87 mmol/L) which were consistent with the histopathological findings of the kidney. The serum biochemistry also indicated some degree of hepatocellular injury due to a mild elevation in GLDH (33 U/L, ref. 0-30 U/L), and cholestasis due to a moderate increase in GGT (381 U/L, ref. 0-55 U/L). Other serum biochemistry findings included elevations in AST (259 U/L, ref. 0-130 U/L) and CK (1935 U/L, ref. 0-300 U/L). Histopathology of the liver was performed at a later stage and showed changes which indicated a mild hepatocellular insult.

In the second ewe, the Johnes Disease serology (ELISA) was negative. On histopathology of the intestine, there was mild chronic enteritis, but no histological evidence of OJD was seen at the ileocecal junction. The most significant histopathological changes in this ewe were not in the samples of the kidney, but rather the liver. There were both acute and chronic changes noted in the liver. Chronic changes to the liver included moderate-marked, diffuse biliary hyperplasia with a mild portal and centrilobular fibrosis. There was also mild-moderate, centrilobular vacuolar hepatopathy with multifocal single-cell hepatocyte necrosis. The acute changes included a suppurative hepatitis from which *Escherichia coli* (*E. coli*) was cultured. The growth of *E. coli* in association with suppurative hepatitis was considered likely to be significant and indicative of a secondary septicemic process. The chronic changes, on the other hand, were considered likely to be from exposure to a toxic plant. The serum biochemistry profile revealed elevations in GGT (196 U/L, ref. 0-55 U/L) and GLDH (158 U/L, ref. 0-30 U/L) which were consistent with hepatocellular damage. Other biochemistry findings included elevations in urea (20.7 mmol/L, ref. 2.9-7.1 mmol/L), phosphorus (3.0 mmol/L, ref. 1.13-2.58 mmol/L), AST (914 U/L, ref. 0-130 U/L) and CK (1337 U/L, ref. 0-300 U/L), and a mild hypocalcaemia (1.84 mmol/L, ref. 2.12-2.87 mmol/L).

Following the investigation, discussion with the producer revealed a history of mixing DDG sheep pellets (50%) with the barley grain (50%) which was fed out in January, February and early March. The ewes were also fed lupin grain during the early summer, and the producer commented that the lupin grain at the bottom of the silo was wet and mouldy. The low dietary calcium and high dietary phosphorus content of the pellet, along with a low nutritional plain of calcium while grazing cereal crops and the demand of calcium during lactation, is likely responsible for the development of urolithiasis despite ad libitum access to mineral supplements. The feeding of wet, mouldy lupin grain likely resulted in phomopsin toxicity which could have been responsible for the lesions observed in the liver. It is suspected that the combination of urothiasis, lupinosis and the demands of lactation were the contributing causes of ill-thrift and loss of condition in the tail end of ewes in this flock.

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

Transmissible Spongiform Encephalopathy (TSE) excluded from ewes with neurological signs

By Amanda Walker

In August, a sheep producer on the Northern Tablelands reported ten deaths over three weeks in mature Merino ewes. He reported that the affected sheep initially appeared blind, to be drooling and became isolated from the mob before progressing to recumbency and death.

Due to severe drought conditions in the region at the time, the pregnant ewes were being fully hand-fed in several adjoining containment areas. The ration provided daily consisted of whole barley, cottonseed and either silage or hay depending on availability. Mortalities had occurred in each of the containment areas, and there had been one other death in a nearby paddock of rams which were also being supplementary fed.

Three affected animals were examined by the District Veterinarian. The individuals examined were ambulatory, slightly depressed and could not keep up with the mob when moved. Two of the affected sheep displayed a slight head tilt and had reduced muscle tone in the lip and tongue (Figure 1). The tongue would intermittently loll from the side of the mouth, and there was some associated drooling (Figure 2). There was marked tachypnea and a fine muscle tremor over the entire body.

One animal was euthanased for post-mortem examination and collection of samples to exclude the presence of a Transmissible Spongiform Encephalopathy (TSE) and confirm a suspected diagnosis of listeriosis. The brain and sections of the spinal cord were removed intact, with no gross pathology apparent. All organs within the abdominal cavity were grossly normal. Within the thoracic cavity, much of the lung parenchyma appeared consolidated with areas of darkened tissue, and the bronchi contained a large volume of blood-tinged stable foam (Figure 3).

Collected samples were submitted to Laboratory Services at Elizabeth Macarthur Agricultural Institute (EMAI) for diagnostic evaluation. Histopathology of the brainstem found severe multifocal acute to subacute suppurative encephalitis with perivasculitis with moderate multifocal non-suppurative meningitis of the brainstem and cerebrum. These lesions are considered pathognomonic for listeriosis.

No histological lesions suggestive of TSE were detected at the brain sites specified in the 'Australia and New Zealand Standard Diagnostic Protocols for Animal Diseases'.

Figure 1: Affected sheep displayed a slight head tilt and had reduced muscle tone in the lip and tongue. Image by A Walker.

Histopathology of the affected lung tissue found no significant pathology; however, the culture of this tissue produced a sparse growth of *Bibersteinia trehalose*. The significance of this bacterium in the case is unclear; however, gene sequencing suggests that the isolate is closely related to *Globicatella* species, which has previously been reported to cause meningoencephalitis in lambs. Interestingly the previously mentioned ram death showed similar clinical signs and had very similar gross lung pathology; however, there was no histological evidence of listeriosis.

Listeria is known to cause a range of disease processes in livestock, including meningoencephalitis, abortion and septicaemia. Sheep, in particular, pregnant ewes, are more susceptible to listeria than other classes of stock and the feeding of silage is a known risk factor.

In this case, it was considered that silage was the most likely source of listeria, and once the provision of this feed source ceased, no new clinical cases developed.

TSEs are prohibited matter in NSW under the *Biosecurity Act 2015*. There are mandatory measures in the Biosecurity Regulation (2017) to prevent TSEs occurring in Australia. Everyone involved in the ruminant value chain has a general biosecurity duty to ensure that, so far as reasonably practicable, the risk of TSEs occurring in NSW is prevented.

For further information contact Amanda Walker, District Veterinarian, Northern Tablelands Local Land Services, Armidale on (02) 6770 2026.

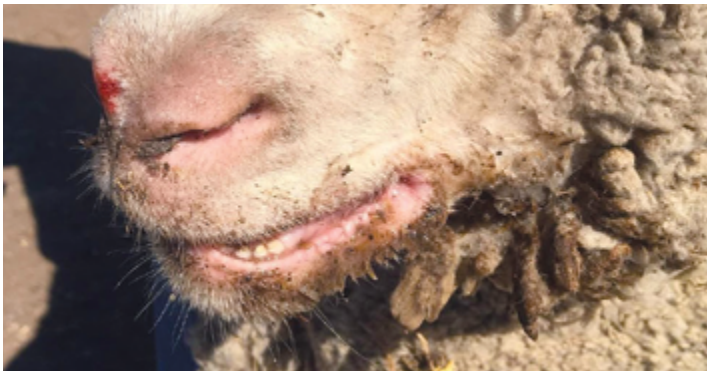

Figure 2: Hypersalivation of affected sheep. Image by A Walker.

Figure 3: Lung parenchyma appeared consolidated with areas of darkened tissue, and the bronchi contained a large volume of blood-tinged stable foam. Image by A Walker.

Australian Bat Lyssavirus (ABLV) in Q3

By Ofir Schwarzmann

Over 2019, NSW DPI has seen an increase in the number of bats submitted for Australian Bat Lyssavirus (ABLV) testing compared to recent years (Figure 1). Between 2015-2018, the average number of bats tested in the third quarter (July-September) was 16.5 bats, and in 2019, 55 bats were tested. Bats in 2019, were most commonly sent to Laboratory Services at Elizabeth Macarthur Agricultural Institute (EMAI) for ABLV exclusion testing following potentially high-risk interactions with domestic animals (61%), humans (14%) or both (14%) (Figure 2). No tested bat has been positive for ABLV in the third quarter. To date in 2019, ABLV has been detected in six bats (3.4%) in NSW, which is above the 2015-2018 average seen for the period between January to September (3.5 positive bats). Increased submissions in 2019 are likely related to heat or drought, resulting in increased bat contacts.

ABLV has been found in both fruit bats (flying foxes) and in small insect-eating bats (microbats). All bat species in Australia are regarded as being potentially infectious. Research indicates that ABLV is a rare infection, estimated to be present in less than 1% of wild bats. However, the prevalence in bats submitted to laboratories for ABLV testing (sick, injured or recently dead bats), is higher.

Private veterinarians are integral to the management of ABLV infection and exposure cases, including the submission of bats to the laboratory. Advice for private veterinarians can be obtained from the 'Australian Bat Lyssavirus guidelines for veterinarians' found on the NSW DPI website.

The best protection against being exposed to ABLV is to avoid contact with bats. If bats must be handled, such as by a veterinarian for treatment, then appropriate personal protective equipment (PPE) should be worn, and the bat handler must be rabies vaccinated as per 'The Australian Immunisation Handbook'. PPE includes puncture-resistant gloves and gauntlets, long-sleeved clothing, safety eyewear or face shield to prevent mucous exposures, and a towel to hold the bat. A garden fork, spade or other implements should be used to handle dead bats. Rabies vaccination is thought to provide cross-protection against an ABLV challenge. Pet owners should also take precautions in preventing direct contact between their companion animals and bats, such as confining the pet at night.

Since November 1996, three people have died as a result of ABLV infection. All three cases had a history of scratches or bites from bats, and the affected people were not previously vaccinated against rabies. In 2013, two horses were euthanased after being infected with ABLV from bats. Overseas, closely related lyssaviruses cause illness in a wide range of domestic and wild animals. It is possible ABLV infection in other animals may be reported in Australia in the future.

For further information contact Ofir Schwarzmann, Veterinary Policy & Project Officer, NSW DPI Animal Biosecurity, Orange on (02) 6391 4612.

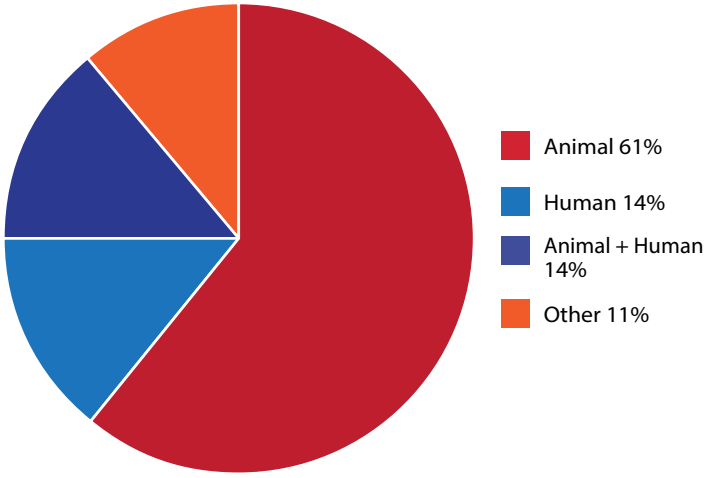

Figure 1: Reasons for bat submissions. Graph by O Schwarzmann.

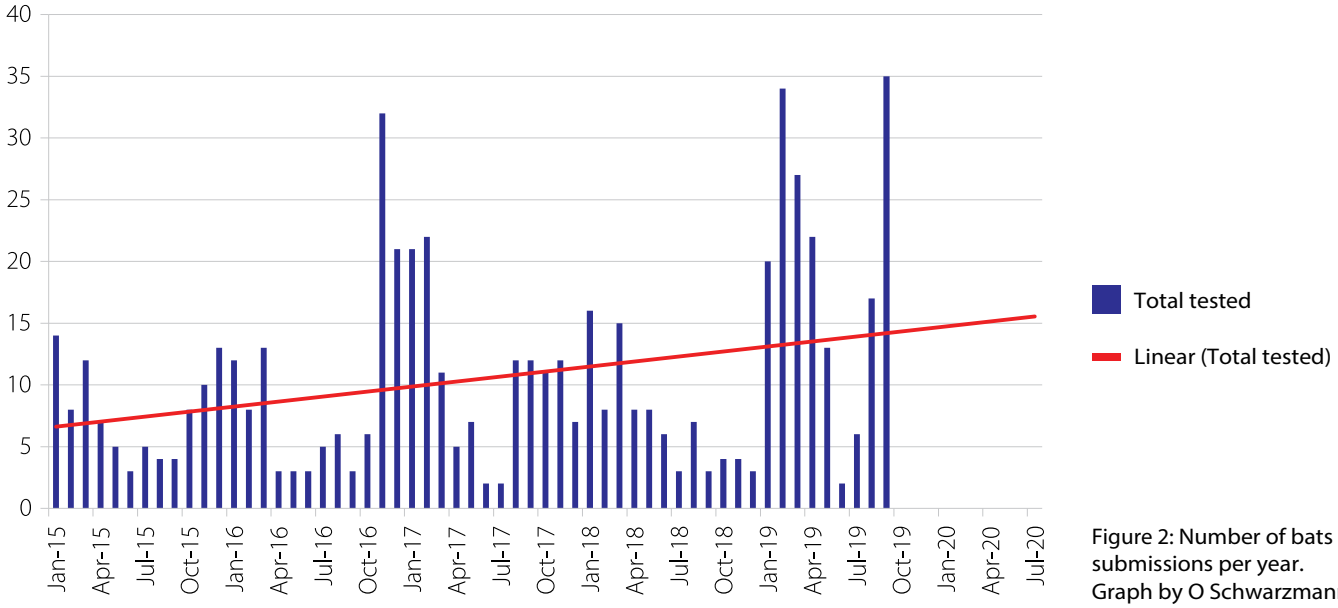

Figure 2: Number of bats submissions per year. Graph by O Schwarzmann.

Survey

How can we improve the NSW Animal Health Surveillance newsletter?

We're seeking your thoughts on the Animal Health Surveillance newsletter, which is a quarterly report and plays an important part in raising awareness and sharing knowledge of notifiable disease investigations and issues amongst government and industry professionals. The information and articles for this newsletter are supplied by NSW Department of Primary Industries (DPI) staff and Local Land Services (LLS) District Veterinarians.

We'd like to know what works, what doesn't work, and what we can do better. Accordingly, we would appreciate you taking the time to complete this short survey. The answers will help us continue to provide the latest animal health surveillance news in an engaging and relevant way.

This survey can be completed by hand, then scanned and emailed to **ofir.schwarzmann@dpi.nsw.gov.au**

Alternatively, this survey can be completed electronically using the following link:
https://www.surveymonkey.com/r/SDP9P9K

1. Please rate the quality of the information contained in the NSW Animal Health Surveillance newsletter?
   - ☐ Excellent
   - ☐ Good
   - ☐ Okay
   - ☐ Needs improvement
   - ☐ Poor

2. Having information and case studies written by LLS District Veterinarians who conduct disease investigations on-farm is engaging and the best way to present animal health surveillance information.
   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neutral
   - ☐ Disagree

3. I like the current layout and look of the Animal Health Surveillance newsletter.
   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neutral
   - ☐ Disagree

4. Photos of diseases and animal health issues are important.
   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neutral
   - ☐ Disagree

5. I would like to see more animal health statistics and data presented in the Animal Health Surveillance newsletter.
   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neutral
   - ☐ Disagree

6. I would prefer the Animal Health Surveillance newsletter to be delivered:
   - ☐ Electronically via email
   - ☐ Electronically via the NSW DPI or LLS website
   - ☐ As a paper-based hard copy

7. What is the one thing you find most valuable about the Animal Health Surveillance newsletter?

8. If you could change one thing about the Animal Health Surveillance newsletter, what would it be?

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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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 over any equivalent product from another manufacturer.

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

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