NSW GOVERNMENT

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

NEW SOUTH WALES

ANIMAL HEALTH SURVEILLANCE

October 2020 – March 2021 » Issue 2021/1

Contents

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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.

African swine fever excluded from piglets

In February 2021, Encephalomyocarditis (EMC) killed 68 piglets, aged approximately 6 weeks old, on a free-range piggery in the Upper Hunter.

The producer contacted the District Veterinarian after 17 piglets died in a 24-hour period. All piglets were 6 weeks old and from the same batch. There were 100 pigs of this age on the farm. The producer has a large free-range farming operation which had recently experienced high rainfall. The piglets were still on the sows and a week off weaning. The sows were up to date with vaccinations. The pigs were fed a commercial feed supplemented with vegan cakes from a bakery. Piglets had access to a creep feed. Piglets were reported to go quiet and sit in a corner, followed by violent seizures, resulting in death a short time later. The owner also reported that the piglets skin turned purple as they died.

A post-mortem examination of two of the recently deceased piglets, one male and one female, was undertaken. Both animals were in good body condition and no significant abnormalities were visible on post-mortem. Multiple samples including both brains were sent to the laboratory for histology, culture and PCR. Real time PCR and virology successfully ruled out both African swine fever and classical swine fever. Similarly, pestivirus, erysipelothrix and porcine circovirus type 2 were excluded via negative PCR results. No pathogens of note were identified on culture. Encephalomyocarditis virus was identified via PCR undertaken on pooled heart tissues of both piglets.

EMC is most commonly associated with rodents and is usually linked to increased contact with rodents. The virus is shed in rodent faeces and urine, but it is also possible in the case of piggeries that animals may become infected by eating rodents infected with EMC. As this is an unenveloped virus, it can persist in the environment for an extended period of time. It has been shown experimentally that pigs shed the virus via nasal secretions for the first 3 days following infection, with pig to pig transmission not as common.

There is no treatment for EMC in pigs however reducing stress factors may improve prognosis. There is currently no commercial vaccine for the EMC virus available for pig producers. Prevention of viral spread is achieved through minimising the exposure of pigs, especially young piglets and pregnant sows, to viral particles. This should be done by ensuring there is no contamination of feed or water sources with rodent urine, faeces or carcasses which are the primary source of the virus. In times of increased rodent numbers the risk to pig populations is higher therefore it is recommended that extra care be taken to ensure the upkeep of adequate biosecurity measures. This was especially relevant to this case as, in February 2021, NSW was experiencing an unprecedented rodent plague. On initial diagnosis, the producer had not noticed an increase in rodent activity. With further investigation of his pastures, a significant increase in rodent numbers was observed.

Deaths ceased after the creep feed was removed and further extensive rodent control was implemented. The producer began weaning these piglets a week earlier at five weeks of age and moved them to his other property, so that there was no requirement to have creep feed available, which subsequently minimised the contamination from rodents.

For further information, contact Kristi Arnot, District Veterinarian, Hunter Local Land Services, Singleton on 0409 758 823.

Anthrax exclusions and incident October 2020 – March 2021

There was one anthrax incident in January 2021. A producer in the Tottenham district noticed that sporadic mortalities over a few weeks had been occurring in one mob of ewes with lambs at foot. At the end of January, a private practitioner examined animals and performed the immunochromatographic test (ICT) on a dead lamb with a positive result. This was followed up with the District Veterinarian testing additional animals with another ICT positive result. Samples were collected for laboratory examination and anthrax was confirmed by PCR at the State Veterinary Diagnostic Laboratory (SDVL). The incident was managed according to NSW DPI Anthrax procedure; an Individual Biosecurity Direction was issued for quarantine, stock and livestock product movement control, vaccination, decontamination and appropriate carcass disposal by burning. A total of 224 ewes and lambs died out of approximately 4000 head. Cattle on the property were not affected.

During the 2 quarters there were 67 investigations of mortalities where anthrax was excluded as the cause of death. Of these, a total of 32 investigations were in cattle where alternate diagnoses included clostridial infections, septicaemia, Theileriosis and hepatopathies. There were 33 investigations in sheep where alternate diagnoses included lactic acidosis, intestinal parasitism, pneumonia and water deprivation. A single investigation in a goat found hepatitis and pneumonia, and no alternate diagnosis was found for a single investigation in an alpaca.

Table 1: Number of investigations Alternate diagnoses for mortality investigations where anthrax was excluded

Species	Diagnoses	No. Investigations		
		ICT used		
		Yes	No	Grand Total
Cattle	Abscess	1		1
	Clostridial infection	1		1
	Clostridial infection - *Cl. chauvoei*	1		1
	Endocarditis	1		1
	Hepatopathy		1	1
	Hepatopathy, Pneumonia - Interstitial		1	1
	Myocarditis, hepatopathy		1	1
	Septicaemia; blood poisoning; bacteraemia	1		1
	Septicaemia; blood poisoning; bacteraemia, Mastitis - other	1		1
	Theileriosis	3		3
	Toxicity - salt	1		1
	No diagnosis	14	5	19
Cattle Total		**24**	**8**	**32**
Sheep	Clostridial infection - *Cl. perfringens*	1		1
	Dehydration, Hypocalcaemia, Internal parasitism - Nematodirus, Internal parasitism - Strongyle eggs	1		1
	Internal parasitism - Haemonchus	1		1
	Lactic acidosis	4		4
	Meningitis, Septicaemia; blood poisoning; bacteraemia, Pneumonia		1	1
	Nephritis		1	1
	Pleurisy, Pneumonia	1		1
	Pneumonia	2		2
	Salmonellosis, Water Deprivation, Hypocalcaemia, Toxicity - salt	1		1
	Septicaemic pneumonia	1		1
	Toxicity - copper, Toxicity - pyrrolizidine alkaloid - plant not identified	1		1
	Toxicity - urea	1		1
	Urolithiasis	2		2
	Water Deprivation	1		1
	Water Deprivation, Hyperthermia, Toxicity - salt	1		1
	No diagnosis	12	1	13
Sheep Total		**30**	**3**	**33**
Camelid	No diagnosis		1	1
Camelid Total			**1**	**1**
Goat	Hepatitis, Pneumonia	1		1
Goat Total		**1**		**1**
Grand Total		**55**	**12**	**67**

Foot-and-mouth disease excluded from a Friesian steer

Malignant Catarrhal Fever (MCF) was diagnosed as the cause of lethargy, mild ataxia and progressive blindness in a 2-year-old Friesian steer near Molong in late December.

The affected steer was acquired from a local dairy as a calf and became a pet on the mixed beef and wool property.

The producer contacted Central Tablelands Local Land Services after the animal failed to respond to treatment with long-acting antibiotics. Physical examination was undertaken five days after the initial onset of clinical signs. The steer was profoundly dull and listless. Marked bilateral corneal opacity leading to complete blindness was present. The steer had a severe mucopurulent discharge from both nostrils and the nasal planum was covered with dry crusts and superficial erosions. Whilst the steer was salivating excessively, detailed examination of the oral cavity was not possible due to inadequate restraint facilities. Skin over the lateral neck was dry and flakey. Lesions were present on the coronary band and at the junction of the skin and dew claws on three feet. The steer was pyrexic (39.9°C) and haematuria was noted during urination.

Samples were submitted for exclusion of exotic vesicular diseases. Testing at the Australian Animal Health Laboratory (AAHL) was negative for foot-and-mouth disease and vesicular stomatitis. The MCF Virus PCR conducted at the State Veterinary Diagnostic Laboratory (SVDL) was positive.

MCF is an acute, fatal lymphoproliferative disease of cattle. Ovine herpesvirus-2 (OvHv-2) causes the 'sheep associated' form of the disease which is observed in Australia. The case history will commonly reveal an association with sheep as was present in this investigation, and the incidence of MCF in cattle tends to be higher around lambing time. Cattle are about 100 times less susceptible to acquiring the infection than sheep but are approximately 100 times more susceptible to developing disease. OvHV-2 is not naturally transmitted from cow to cow, thus cattle are considered a dead-end host for the virus.

Figure 1: Bilateral corneal opacity leading to complete blindness. Photo by A. Masters.

Whilst the pathogenesis of MCF in cattle is not fully understood, the pathological changes are associated with infiltration of lymphocytes, lymphoid hyperplasia and lymphoid vasculitis leading to terminal disseminated intravascular coagulation and tissue necrosis.

MCF has a sudden onset and typically affects only a single animal in the herd. The disease is usually observed in younger cattle (8-24 months old). The 'head and eye' form, as was seen in this case, is the most common presentation. MCF may also present as a peracute, alimentary or neurological form. Rarely it can occur in a mild form from which the animal appears to partially recover before later dying. Cattle generally die from MCF within 3 to 7 days. Immediate euthanasia was recommended in this case.

For more information, please contact Amy Masters, District Veterinarian, Central Tablelands Local Land Services on 0428 710 002.

Figure 2: Severe mucopurulent nasal discharge and crusting/ulceration of the nasal planum. Photo by A. Masters.

Figure 3: Lesions on the coronary band. Photo by A. Masters.

Yersiniosis in goats

Yersiniosis is a rare diagnosis in the Gunnedah district of North West NSW. It is particularly rare during summer months.

Yersinia enterocolitica was diagnosed in a herd of 260 goats. Clinical signs included ill thrift, rapid weight loss, submandibular and facial oedema, diarrhoea and deaths.

Fourteen goats were affected, and 8 goats died. The goats were run together as one mob and all ages were affected. Initially cases presented in does up to 5 years of age, then in yearling wether kids and a billy 4 years of age.

The goat owners initially presumed the clinical signs were due to internal parasites. They sought veterinary assistance in early February after the goats continued to present with ill thrift, diarrhoea and deaths despite multiple anthelmintic treatments for internal parasites during December and January.

Clinical presentation varied. Severely affected goats were in Body Condition Score 1 (of 5) with rough coats and a watery brown diarrhoea; some with mucous and flecks of blood. These goats were inappetent and would deteriorate, becoming progressively lethargic and eventually dying after a period of 10-14 days. Moderately affected goats were in better body condition but had an intermittent watery diarrhoea and submandibular oedema. Others presented with only submandibular and facial oedema.

On biochemistry the goats were found to be hypoproteinaemic, hypoalbuminaemic, hypocalcaemic and hypophosphataemic.

An autopsy performed on an 18-month-old doe with cachexia and watery diarrhoea, found erythema and ulceration in the mucosa of the rectum and distal colon, and focal erythema in the mucosa of the caecum and jejunum. The mesenteric lymph nodes were enlarged and oedematous. A subacute bronchopneumonia was also present.

Histological findings on the small and large intestine found a superficial, suppurative, subacute, multifocal enteritis and colitis with bacterial colonies. Yersiniosis was suspected and culture of ileum contents resulted in a profuse growth of *Yersinia enterocolitica*.

Johnes Disease was excluded from histological findings. Internal parasitism and coccidiosis were excluded due to low numbers on faecal worm egg counts and histological examination. Chronic enterotoxaemia that can present in goats as intermittent diarrhoea was also considered but no evidence was found on brain histology and epsilon toxin was absent.

Figure 1: Goat on the right with severe clinical signs, weight loss and diarrhoea. Photo by J.Ellem.

Figure 2: Goat with submandibular oedema and intermittent diarrhoea. Photo by J.Ellem.

The disease event occurred on this farm from December to February at the same time that this farm and other farms in the area were experiencing significant mice numbers that had been increasing since the previous October. Yersinia species can be carried by rodents, wild birds and pigs as a potential source of infection for livestock animals.

Yersiniosis is a disease associated with the cooler months however studies have found *Yersinia enterocolitica* to be excreted all months of the year, whereas Yersinia pseudotuberculosis is found to be excreted during the cooler months and has a more seasonal presentation.

Environmental stress factors that occurred at the time and may have facilitated the occurrence of this infection in the goats, included significant summer rainfall events in December followed by a drop in ambient temperature. Internal parasite burdens initially suspected by the owners, may have contributed to the first cases.

After supplying the goats with grain and lucerne hay, the owners observed a resolution of submandibular oedema and reduction in diarrhoea in the mob. Treatment of the more severely affected goats with oxytetracycline effected a recovery of appetite, abatement of signs and improved body condition. There were no more losses after instigating antibiotic treatment and nutritional supplementation.

Yersinia is a potential zoonotic. Australian food processing industries have standards to prevent it entering the food chain. However, this pathogen could affect stock handlers and this emphasises the need for good hygiene practices when handling livestock. This case highlights the importance of a veterinary diagnosis for gastrointestinal diseases of livestock.

For further information, please contact Judy Ellem District Veterinarian North West Local Land Services on 0428 402 482.

Blue tongue exclusion in sheep in Central West NSW

In February, bluetongue virus serology was undertaken on a mob of 200 sheep in the central west exhibiting severe stomatitis, pyrexia and naso-oral haemorrhage. The mature wethers were home-bred merinos run on dry native pasture with extensive saffron thistle *(Carthamus lanatus)*. A mob of ewes and lambs had been run in the same paddock immediately prior with no ill-effects. While the property had experienced an outbreak of Orf virus a decade prior, they no longer vaccinated any of their stock. The producer had observed a significant tail developing in the wether mob over the week since introducing them to the paddock and noticed lesions on the muzzle when bringing them in for drenching.

A very high proportion of the mob (approx. 80%) were affected to some degree with muzzle lesions typically presenting with severe diffuse labial and submandibular swelling with foul-smelling ptyalism, mucopurulent nasal discharge, necrotic erosions and haemorrhages on the oro-nasal mucosa. Animals with more severe lesions (approximately 20%) were emaciated (BCS 1-2), significantly pyrexic (40.5-41.5°C) and exhibited weakness, recumbency and depressed mentation. Ocular mucosa appeared pale. Bluetongue virus was excluded on serology. Although the lack of concurrent erythema and crusting on the ears or face meant that secondary photosensetisation was unlikely, liver enzymes were assessed given the dense growth of Paterson's curse *(Echium plantagenium)* and common heliotrope *(Heliotropum Europaeum)* in the paddock. Mild increases in AST, CK and bilirubin were more consistent with recumbency and anorexia than liver disease. There was a significant increase in haptoglobin in 50% of the assayed animals suggestive of bacterial infection. No other toxic or caustic plants were observed in the paddock. Orf virus was isolated from skin scrapings and mixed bacteria including a dense growth of *Truperella pyogenes* was cultured from swabs of caseous material in the mucosal erosions. Aspiration of submandibular and labial swellings recovered serosanguinous fluid without sulphur granules.

While waiting for laboratory results, severely affected animals were treated with oxytetracycline and non-steroidal anti-inflammatories and the mob was moved to a paddock with softer feed. The producer reported that most animals recovered rapidly and uneventfully. While the wethers had been recently drenched with a triple-active anthelminthic, stymying a worm egg count, a history of ineffective drenching as well as the submandibular oedema and pale ocular mucosa suggest that a heavy heamonchus burden may have predisposed the wethers to infection. The hard feed and thistle on offer likely allowed cutaneous invasion of orf virus. Opportunistic secondary infection by commensal and environmental bacterial including *T. pyogenes* as well as potential septicaemia secondary to inanition and enteric dysbiosis may have contributed to the severe systemic signs observed in some animals. While clinical bluetongue disease is exotic to NSW and the property is geographically removed from the blue tongue zone, exclusion in cases with suggestive symptomology forms an important part of clinical surveillance in NSW.

For further information, please contact Kelly Wood, District Veterinarian, Central West Local Land Services on 0438 842 365.

Figure 1: Wether with diffuse labial swelling and mucopurulent nasal discharge. Photo by K. Wood.

Figure 2: Wether demonstrating diffuse labial oedema with epistaxis. Photo by K. Wood.

Figure 3: Wether with severe labial and submandibular swelling. Photo by K. Wood.

L-tryptophan poisoning in Merino lambs

In February 2021, a producer from the Southern Tablelands contacted the district veterinarian to investigate the sudden death of 20 Merino lambs in a mob of 800. The lambs had died over a period of 4 days, with 15 dying the night before the call was placed. The lambs were on a forage brassica crop. The lambs had been on the crop for 14 days prior to the report being made. All the lambs were vaccinated with 5-in-1 and had received both doses. Recent faecal egg counts had shown low or no worm burden.

A post-mortem examination was performed on 3 available carcasses. Analysis of the aqueous humour using a Combur 9 dipstick returned normal results for nitrates and ketones. Examination of the internal organs revealed cranioventral consolidation of the lungs with fibrinous attachments of the pleura consistent with fibrinous bronchopneumonia. The liver was pale and enlarged with rounded edges. A diagnosis of L-tryptophan poisoning causing acute respiratory distress from ingestion of brassica crop was made.

Brassica crop poisoning can result in multiple syndromes which include acute respiratory distress, type two photosensitization, nitrate toxicity, bloat, grass tetany, polioencephalamalcia, pulpy kidney, and goitre. Acute respiratory distress syndrome is caused by high levels of L- tryptophan in the brassica crop. L-tryptophan poisoning can occur between 7 to 10 days after the animal has grazed on the crop but can sometimes take up to 4 weeks.

Acute respiratory distress results from excessive conversion of L-tryptophan to 3-methylindole by certain species of ruminal microbe, particularly *Lactobacillus* sp. The 3-methylindole is absorbed and transported to the lungs where it is converted to the pneumotoxic metabolite 3-methyleneindolenine in type-I pneumocytes. The 3-methyleneindolenine induces prostaglandin-H synthetase, which results in necrosis of bronchio-alveolar epithelium. This necrosis subsequently leads to acute pulmonary emphysema and oedema.

Affected stock should be taken off the pasture to prevent further ingestion of the crop and started on supportive therapy. This may include antibiotics to treat any secondary bacterial infections, non-steroidal anti-inflammatory drugs. Monesin can be supplemented to stop the conversion of L-tryptophan to 3-methyleneindolenine. No treatment has been identified to reverse the lesions that have already developed in the lungs and stock can continue to die for up to four to seven days after removal from grazing on the crop.

Certain brassicas species have been developed for foraging as they have been selected for low amounts of glucosinolates. Prior to introduction to a forage brassica crop stock should be fed a source of roughage such as hay at a minimum rate of 1kg per head to prevent engorgement, bloat and ruminal acidosis. The herd should be introduced to the crop slowly over 5 to 7 days to allow gradual adaptation of the rumen microbial population. The crop should not compromise more than 60% of the diet. A trace mineral mix that contains magnesium, iodine, selenium, cobalt and iodized salt should be supplemented. The risk of poisoning increases under certain environmental conditions that cause plant stress such as drought and frost or when there is recent flowering. During these conditions grazing should be avoided. On overcast days plants can have increased the level of nitrates. Preventing feeding on these days are recommended.

In this case the stock were removed from the pasture immediately following diagnosis. Coughing animals were treated with Meloxicam (IM – 1ml/20kg) and Alamycin LA 300 (IM - 1ml/10kg). The stock were reintroduced to the pasture for short periods following periods on native pasture for one week. Hay was fed out at greater volumes than previously. Two further deaths were reported over the next week.

This article compiled by Alexis Priola – University of Sydney DVM 4th Year, and Henry Clutterbuck – District Vet Goulburn. For further information, please contact Henry Clutterbuck, District Veterinarian, South East Local Land Services on 02 4824 1910.

Theileriosis in beef cattle

In March 2021, a producer in the eastern Riverina contacted the district vet after he noticed one dead cow and several sick cows on his property. The cows were showing neurological signs including tremor, unusual aggression and weakness. The cows were mixed aged, body condition score 3 with 6-7-month-old calves at foot. They had been recently pregnancy tested as pregnant, due to calve in spring 2021. They were grazing a mixed pasture containing some phalaris and minimal weeds. The water source was a trough fed from a dam. No recent treatments had been applied to the pasture or water and the cattle were not provided any feed or mineral supplements. Inspection of the paddock did not reveal any weed or heavy metal toxin source.

Clinical examination was difficult as recumbent cows attempted to stand if approached. Priority was given to collecting a blood sample from the tail vein. On collection, the blood appeared 'watery' and the mucous membranes of the vulva were pale and slightly jaundice. Another cow suddenly collapsed and died during the visit, so blood was collected, and a post-mortem was conducted. Post-mortem findings included a pale, mildly jaundice carcass, enlarged liver and some serosal haemorrhage on the cecum. The urine was light red.

The producer gave a 4-in-1 mineral injection under the skin to as many affected cows as he could with no response to treatment observed. The following day, all 6 affected cows had died.

Differential diagnoses considered were theileriosis, copper toxicity, leptospirosis, tick fever, lead toxicity, phalaris staggers, hypomagnesemia and lead toxicity.

In-house PCV was 10 and a blood smear revealed the presence of *Theileria piroplasms* which was confirmed at EMAI laboratory the following day. Samples were also submitted for transmissible spongiform encephalopathy, metabolic disease, lead toxicity, tick fever, all of which were excluded, as well as histopathology. PCR testing for Theileria was positive for *Theileria orientalis,* Ikeda.

Theileriosis is an endemic disease in coastal parts of the state and has been seen sporadically over the years throughout inland areas of NSW. This property and surrounding properties did not have a history of Theileria infection previously.

Theileria is an intracellular blood parasite that requires a vector to spread the disease between animals. The main vector responsible for transmission of Theileria is the bush tick *(Haemaphysalis longicornis)* however Theileria has been detected in other biting insects such as mosquitoes and sucking lice which may have potential to spread the disease. Infestation of red blood cells with Theileria results in destruction of the red blood cells causing anaemia. Young and naïve cattle are considered most vulnerable and death rates are highest in heavily pregnant cows. Clinical signs include weakness, pale or yellow mucous membranes, fever, depression, exercise intolerance, recumbency, and death. Pregnant cows may also abort. Neurological signs are not a typical feature of Theileriosis but have been reported and are attributed to a lack of oxygen as a result of the anaemia. Treatment options in Australia are limited and often unsuccessful. Anti-inflammatories can be used to reduce pyrexia and antibiotics may be indicated if secondary infection is a concern. Blood transfusions can help but can be difficult to carry out in the field. Minimizing stress and keeping animals quiet with quality feed and water is important to give them the best chance of overcoming the disease and regenerating new red blood cells. Activities involving mustering or yarding should cease until well after clinical infection has resolved.

For further information, please contact Kristy Stone, District Veterinarian, Riverina Local Land Services, Gundagai on 0428 262 112.

Figure 1: A post mortem of a cow that died from Theileriosis. The fat is jaundice (yellow) due to the breakdown of red blood cells by the parasite. Photo by Kristy Stone.

Figure 2: Recumbency is common in cattle clinically affected with Theileriosis due to low blood volume and reduced oxygen carrying capacity. The mucous membranes of the eyes can be pale or jaundice. Photo by Kristy Stone.

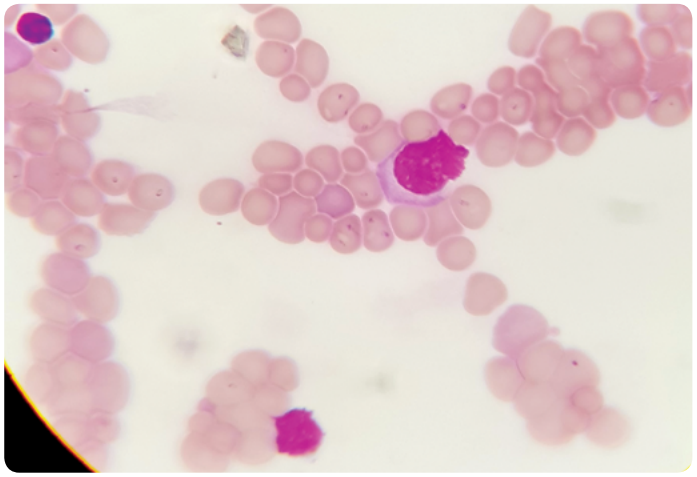

Figure 3: Blood smear from affected animal showing Theileria present in the red blood cells. Blood results also confirmed severe anaemia in this animal. Photo by J. Connolly.

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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