Animal Health

DEPARTMENT OF **PRIMARY INDUSTRY AND RESOURCES**

February 2019

Inside this issue:

New Livestock Biosecurity Officer

Simone (Min) Andrews is the newest edition to the Livestock Biosecurity team in Katherine. You may know Min from her role as a Biosecurity Officer in the Kununurra/Kimberley region of Western Australia.

Min has spent the majority of her life in the Kimberley region and has more than 20 years' experience in the Northern Beef Industry. Her experience and interest in this industry began when she started working in stock camps at a young age on Auvergne station and Newry Station. In 2009, Simone graduated with a Bachelor of Agribusiness from the University of New England. Over the years, Min followed her passion into a number of roles including managing the Charles Darwin University Katherine Campus Brahman stud, Technical Officer at Victoria River Research Station and for last four and a half years as a Biosecurity Officer for Department of Primary Industries and Regional Development in Kununurra Western Australia. As a Biosecurity officer in Kununurra Simone has acquired extensive knowledge in disease surveillance, protocols for cattle travelling across the Western Australia and Northern Territory border and livestock inspections.

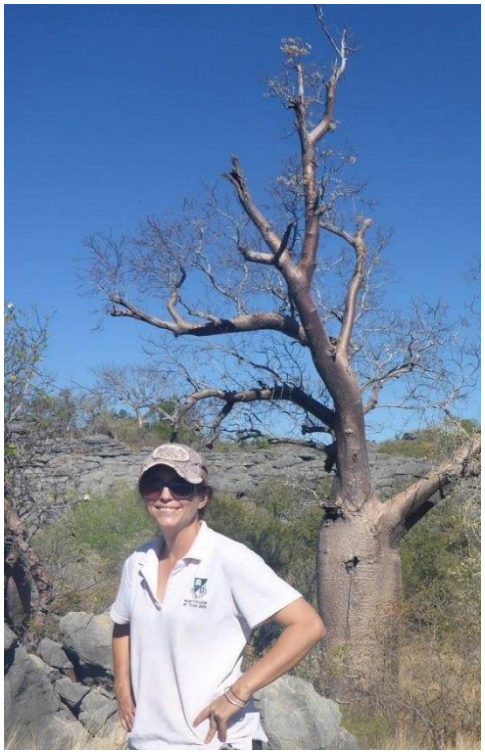


Figure 1: Simone (Min) Andrews

Min looks forward to learning new tasks and expanding her knowledge in the beef industry.

Livestock disease investigations

The department provides a free disease investigation service, including free diagnostic testing through the Berrimah Veterinary Laboratory, to livestock owners for diagnosis or exclusion of notifiable emergency, exotic and endemic disease, including zoonotic diseases. Subsidies are available for producers to contact private veterinarians for significant disease investigations in livestock.

Subsidies for disease investigation

- Subsidies of up to $2,000 are available for disease investigations in cattle conducted by private vets until June 2019.
- For disease investigations in horses and other species, subsidies of up to $250 are available.
- Remember that $300 is available for cattle showing nervous signs where a post-mortem is performed and the brain collected for “Mad Cow” exclusion testing

Please contact your local vet or regional Livestock Biosecurity Officer for more information.

During October to December 2018, 74 livestock disease investigations were conducted to rule out emergency diseases or investigate suspect notifiable diseases across the NT.

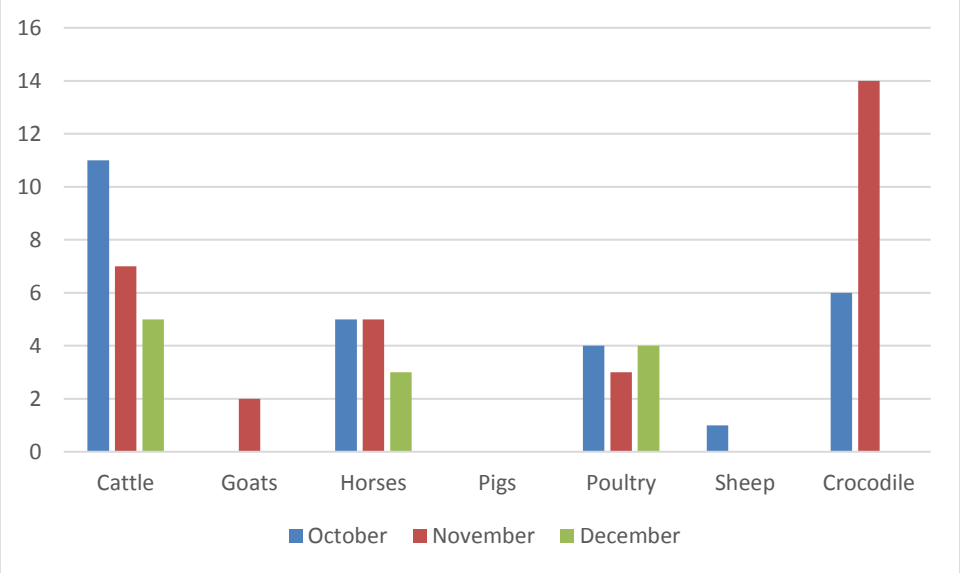


Figure 1: Livestock disease investigations in the NT, October to December 2018

E-Coli in pen feeding trial weaner

A weaner in a phosphorus pen feeding trial herd was noticed to be slow and swaying at a walk during weekly weighing of the animal group. The following day, the animal was off food, tucked up and depressed. A fever, together with nasal discharge and saliva drooling from the mouth were noted, with no visible damage to the nose, mouth or teeth. The breath smelled strongly of acetone, which is an indicator in ruminants of a negative energy crisis, and consequent formation of emergency energy supplies in the form of ketone bodies. The animal was treated symptomatically with electrolyte and fluid replacement and an anti-inflammatory injection; blood, throat and nasal swabs and faeces were submitted to Berrimah Veterinary Laboratory. However, the heifer was found dead the following morning.

On post mortem there was a strong smell of ketones throughout the carcass; ketoacidosis was suspected. One very small section of small intestine (< 5cm long) was severely inflamed (enteritis) without blockage or

visible perforation. Another section of intestine contained what appeared to be a hair faecolith (also known as a hair concretion – a hard solid mass of hair). The kidneys and liver were friable to handle, tending to turn "mushy" when sections were cut in preparation for laboratory submission.

Laboratory examination of submitted tissues showed extensive necrosis (tissue death) and ulceration through the range of gastro-intestinal tissues submitted, with abundant bacteria in the walls of the gut tissues. Interestingly, lesions that were seen under the microscope were not limited to the section of small intestine that was seen to be inflamed with the naked eye. Septic thrombi (infected clots), indicative of widespread infection, were found in the spleen and kidney. The findings are consistent with severe bacterial enteritis (infection and subsequent changes to absorption through the intestinal wall) with spread of the causative organism throughout the body.

The clinical signs associated with this enteritis are consistent with infection by a subset of *E.coli* bacteria which produce Shiga toxins, causing severe illness in affected animals. Cattle are a recognised carrier of this bacteria, which is zoonotic, and a cause of haemorrhagic colitis (bloody diarrhoea) in humans. *E.coli* is capable of causing different disease syndromes in cattle, based on the specific toxins and virulence of the infecting strain. Enterotoxigenic strains typically cause disease in neonatal calves, while enterohaemorrhagic strains are associated with disease in older animals, as in this case. Disease tends to occur in isolated cases rather than herd outbreaks, as cattle carry the infective organism in the gastro-intestinal flora; a primary cause for the development of overwhelming infection was not identified in this case. No other animals in the pen trial were affected.

Tests on the blood confirmed ketoacidosis, which is likely secondary to the gastro-intestinal disease. A negative energy state in which ketone bodies are elevated can occur when carbohydrate reserves are depleted; in this case, this is a secondary effect following inappetance and depression. Changes in the liver were consistent with hepatic lipidosis, and are secondary changes consistent with ketoacidosis and severe debilitation.

These findings are interesting, as they highlight the fact that the clinical signs that can be seen (and in this case, smelled), may not in fact be the primary cause of disease or death. The results of laboratory testing also serve to emphasize the need to submit a range of tissue samples in order to reach a diagnosis; in this case, microscopic examination of the gut samples demonstrated severe disease that was not visible to the naked eye and would otherwise be missed.

Milk Fever

A property owner in the Darwin region reported two downer cows out of a herd of 12 *Bos taurus* cattle. The cows had been on the property for a few years, and there had been no recent management changes. The cows had had access to a bull. There was no supplement lick and there had been a number of recent storms. A cow was seen to be acting unusually, before being found down and then dead the next day. When a second cow was found down the regional Veterinary Officer and Livestock Biosecurity Officer were called to investigate.

On examination the cow was unable to move the legs or tail, and there was no deep pain response. There were no obvious signs of calving or trauma and the cow had a fever (40.2C). There were normal cow pats near the cow and no signs of struggling. The cow was euthanased for post mortem examination. Post mortem showed the cow to be in late pregnancy. There was significant bruising in the muscles and other

tissue, the urine was dark and the kidneys enlarged. The calf was a bull calf, and the liver broke up more easily than expected. A range of samples were taken for lab testing, which showed low calcium (hypocalcaemia), muscle damage and breakdown of the liver.

Based on the findings of the post mortem and the samples collected, a diagnosis of milk fever was made. Milk fever is uncommon in the NT, and is generally associated with dairy cattle that produce a large quantity of milk; however, it can also occur in beef cattle. Milk fever is caused by low calcium in the blood; this causes a decrease in muscle function which can result in weakness, recumbency, depression and ultimately death. Pasture usually contains enough calcium to meet the minimal requirements of cattle, however a dramatic increase in calcium requirements occurs with the onset of lactation in the cow.

For this small managed herd the following recommendations were given and no further losses were reported:

- After joining, keep cows on a low calcium diet (ie. high in roughage and low in green feed) and make sure they don't become over fat.
- In the few weeks prior to calving, keep cows in a close paddock and observe them frequently. If down cows are noted and milk fever is suspected, consider administering a 3 in 1 or 4 in 1 vaccine treatment and contact a vet.
- Consider shortening the joining period so that approximate calving dates are known. This will make it easier to manage feeding and observation close to calving.

Tick Fever

Cattle ticks transmit organisms that cause tick fever, commonly known as 'red water' in cattle. Tick fever can result in loss of condition, mortalities, abortions and reduction in bull fertility. There are three types of tick fever organisms, *Babesia bovis*, *Babesia bigemina* and *Anaplasma marginale*.

Cattle that have been exposed to cattle tick at a young age build up lifelong immunity to these organisms, however, cattle from the tick free area that have never been exposed to cattle ticks will not have immunity. Cattle from the tick free area will require tick fever vaccination before moving in to a cattle tick infected area.

Clinical signs of tick fever

Signs of tick fever include:

- weakness
- depression
- sudden development of fever - temperature around 41° C (106° F). The fever stage usually lasts about a week.
- loss of appetite and rumination (chewing of cud) ceases
- The animal isolates itself from the herd; it is disinclined to move and stands with the head lowered and ears drooping.
- The coat may appear ruffled, breathing becomes rapid and jerky and heart beat is accelerated.
- The mucous membranes of the eyes, nose and mouth become yellow due to anaemia and jaundice.

- The animal exhibits incoordination of the hindquarters, muscle shivering and a tendency to charge when disturbed.
- Emaciation occurs.
- The animal passes red coloured urine.

Note: Most deaths occur in the third week, but may occur any time after 24 hours of infection. Death may be precipitated by exertion or excitement.

Despite the common name 'red water', red urine is only occasionally present and is seen late in the course of the disease. Cattle with *Babesia bovis* infections may be quite sick even if they do not show signs of anaemia and red urine.

Diagnosing tick fever

Tick fever is difficult to diagnose based on clinical signs alone. The best way to diagnose tick fever is through laboratory examination of blood smears.

Risk factors for tick fever

Breed

British and other *Bos taurus* cattle breeds are more susceptible to tick fever caused by *Babesia* organisms than Brahman (*Bos indicus)* breeds. Cross breeds (*Bos taurus* x *Bos indicus*) have intermediate susceptibility which will vary depending on the percentage of each breed type.

Both *Bos indicus* and *Bos taurus* breeds are highly susceptible to disease caused by *Anaplasma marginale.*

Age

There is a strong link between age and resistance with most outbreaks occurring in animals 18 to 36 months of age. Calves exposed to tick fever organisms between three to nine months of age rarely show clinical signs and develop a solid, long-lasting immunity.

Exposure

Cattle born and raised in areas where cattle ticks are endemic can develop natural immunity through exposure to ticks infected with tick fever.

However, exposure of calves to ticks infected with tick fever (and subsequent development of protective immunity) can be highly unpredictable. Exposure is influenced by factors such as breed, season and tick-control strategies.

Cattle from tick free areas should not be introduced into cattle tick infected areas without first receiving a tick fever vaccination. Ideally cattle will be vaccinated prior to nine months of age so they are set for later in life. The second best option is to ensure that cattle have been vaccinated at least two months prior to departure from tick free area to ensure that immunity has developed. If cattle need to be moved shortly after vaccination they should be moved either before day seven, or between days 21 to 30 after vaccination. This provides the less stress during the animals' peak reaction times.

Treatment

There are two types of tick fever vaccination, chilled trivalent vaccine and frozen trivalent vaccine. The more commonly used chilled trivalent vaccine is a live vaccine that contains strains of three tick fever parasites (*Babesia bovis*, *Babesia bigemina* and *Anaplasma marginale*). The frozen vaccine, also known as Combavac 3 in 1, is used in remote areas where it is not possible to get chilled vaccine delivered by the following day, or for properties where vaccine is needed to be kept on hand.

If used as directed, one dose of the live vaccines should provide lifelong immunity against all three parasites. The organisms in the vaccine multiply once injected in to the cattle, as would occur in a real life infection. The organisms in the vaccine are less infectious, allowing for immunity to develop without mortalities or serious production losses.

Ordering the vaccine

You can order vaccine directly from the Tick Fever Centre, through your local veterinarian or rural agency.

Chilled vaccine: Chilled vaccine is only produced on Tuesdays and Thursdays. Orders are not accepted on the day of dispatch but must be in by 4pm the day prior (Monday or Thursday) to production.

Frozen vaccine: Frozen vaccine is dispatched on Fridays, so orders must be received by 4pm on Wednesday.

References

Business Queensland 2016, *Tick Fever Vaccines for cattle*, Queensland Government, accessed 1st February 2019 <https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/livestock/cattle/tick-fever-vaccines >

Department of Primary Industry and Resources 2016, *AgNote: Tick Fevers of Cattle*, Northern Territory Governments, accessed 19th February 2019 <https://dpir.nt.gov.au/__data/assets/pdf_file/0010/233488/713.pdf>

NT WAYBILL – *28 DAYS*

OBLIGATIONS OF THE OWNER OF THE LIVESTOCK

1. A copy of the waybill *must* be forwarded to the Department *within 28 days* after the date on which the waybill was issued.

2. The owner *must* retain a copy of the waybill for at least 7 Years.

3. At the request of an Inspector during that period - the owner *must* produce the copy to the inspector.

NLIS REPORTING – *48 HOURS*

NLIS REPORTING OBLIGATIONS FOR THE OWNER OF PROPERTY OF DESTINATION

1. The owner of the destination property *must* ensure the NLIS transfer is entered on the NLIS database *within 48 hours* after the movement is completed .

If you are unsure or have any questions on any aspect of meeting your compliance obligations please contact your local livestock biosecurity officer.

NORTHERN TERRITORY GOVERNMENT

Post mortem and disease investigation workshop

Veterinary officers Megan Pickering and Elizabeth Stedman from the Livestock Biosecurity Branch, delivered an interactive post mortem and disease investigation workshop for cattle producers in the Katherine Region. Hosted by the Riggs family at Lakefield Station on a blisteringly hot December day, the 24 participants eagerly engaged in the hands-on experience of sample collection and preservation in the field.

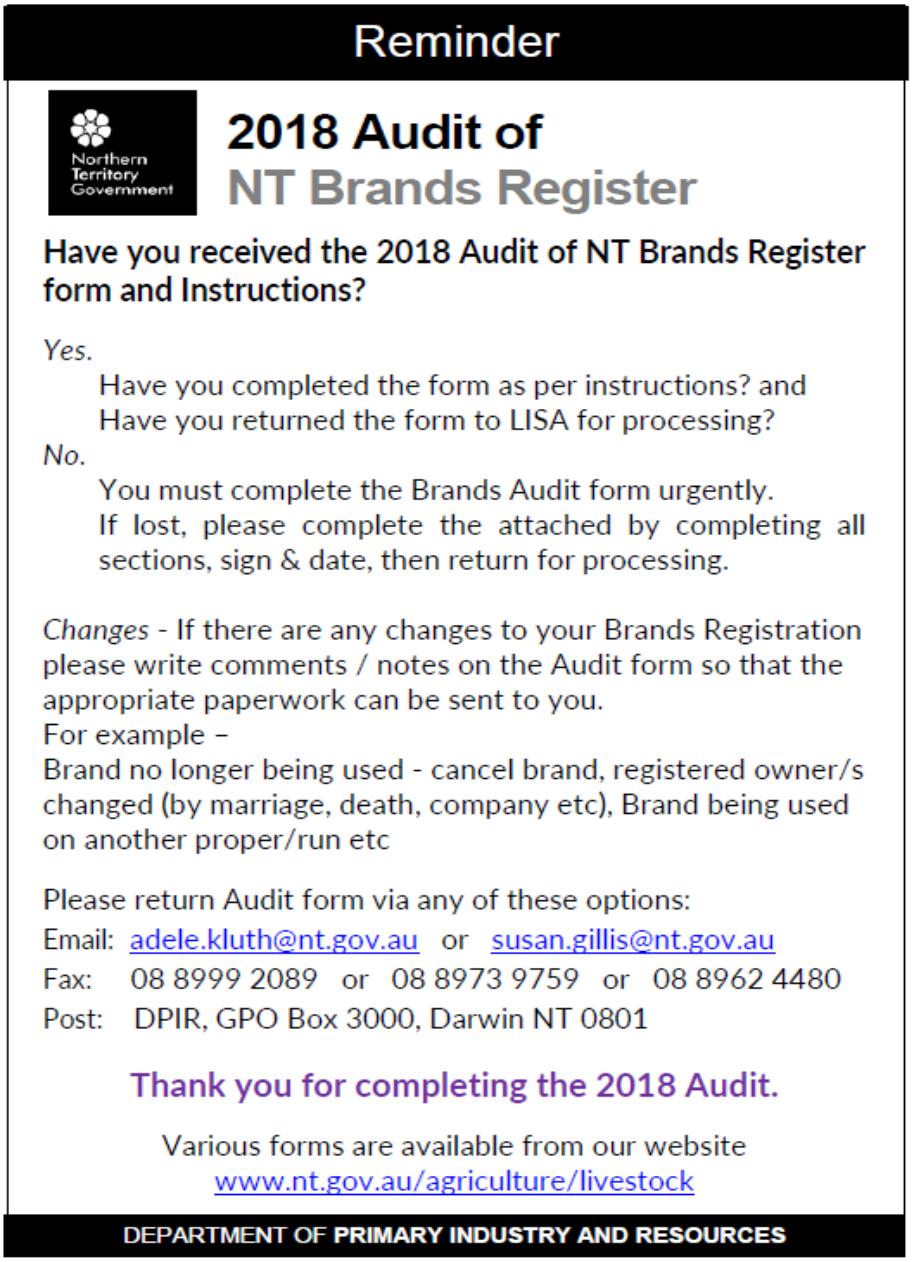
Commencing with a theory session, the workshop covered potential biosecurity threats to Australian pastoral industries, the various mechanisms in place to protect livestock, the response systems and combined government/industry approaches that would be taken in the case of an exotic or emergency animal disease incursion, and the role of the producer in on-farm biosecurity and early disease detection and reporting. Extreme climatic conditions and extensive grazing practices in northern Australia pose significant challenges to effective disease investigation options, and the option for producers to collect meaningful samples in the early phases of a disease outbreak was welcomed.

Two complete post mortems were then undertaken, where the practical aspects of tissue sampling were discussed around issues such as appropriate sample size, how to recognise normal versus abnormal tissues, tips and tricks on tissue handling to avoid excessive tissue damage or disruption in sample collection, and how to store, pack and dispatch both fresh and preserved tissues from the field.

At the conclusion of the workshop, participants from each station were presented with a sample collection kit. It is envisaged that such training will encourage and enable producers to confidently collect diagnostically meaningful samples in the early stages of a disease outbreak, which is a key factor in Northern Territory and Australian biosecurity preparedness strategies.

Figure 3: Field Veterinary Officer Megan Pickering providing post mortem training

This workshop was funded by the Northern Australia Biosecurity Surveillance project through funding from the Australian Government Agricultural Competitiveness White Paper. The project is a collaboration between the Commonwealth and Queensland, Western Australia and Northern Territory Departments of Agriculture and Animal Health Australia.



Contact the Livestock Biosecurity team

Darwin		**Katherine**	
Regional Livestock Biosecurity Officer	08 8999 2034	Regional Livestock Biosecurity Officer	08 8973 9767
Livestock Biosecurity Officer	08 8999 2030	Livestock Biosecurity Officer	08 8973 9765
Tennant Creek		**Alice Springs**	
Principal Livestock Biosecurity Officer	08 8962 4458	Senior Field Veterinary Officer	08 8951 8181
Livestock Biosecurity Officer	08 8962 4492	Regional Livestock Biosecurity Officer	08 8951 8125

Department website: nt.gov.au/industry/agriculture/livestock