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Livestock disease investigations

The Department of Primary Industry and Resources provides a free disease investigation service to livestock owners for diagnosis of notifiable emergency, exotic and endemic disease, including zoonotic diseases. Berrimah Veterinary Laboratories provide free diagnostic testing for exclusion of notifiable disease for all disease investigations, and subsidies are available to private veterinarians for significant disease investigations in livestock. The Northern Australia Enhanced Disease Surveillance program has been introduced from 2017-2019 on a trial basis providing increased subsidies for cattle and buffalo disease events reported to and investigated by private veterinarians. This program recognises the higher costs and challenges associated with conducting disease investigations in more remote regions.

During January to March 2018, 55 livestock disease investigations were conducted to rule out emergency diseases or investigate suspect notifiable diseases across the Northern Territory (NT). Figure 1 shows the number of investigations by species of livestock.

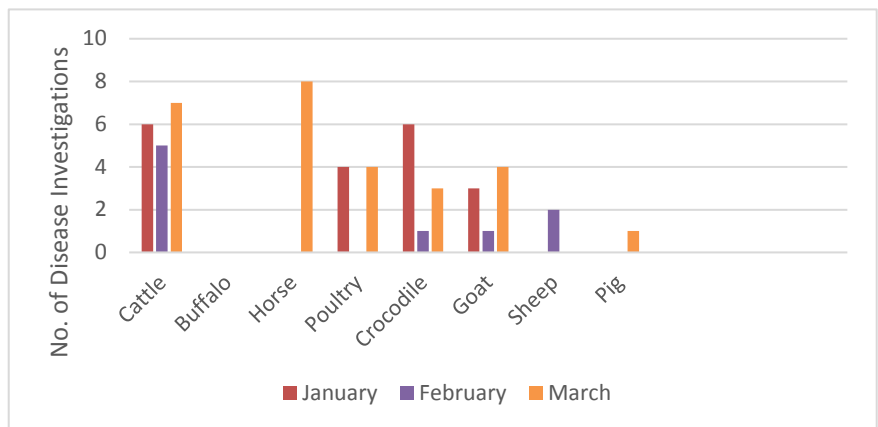


Figure 1. Livestock disease investigations by species for January to March 2018

Berrimah Veterinary Laboratories processed 119 livestock sample submissions, including samples to substantiate proof of disease freedom certifications, for accreditation programs and targeted surveillance to support market access. The following case reports are a selection of disease incident field investigations during the quarter.

Botulism in weaner cattle during the wet season

In late January a pastoral property outside of Darwin reported several cattle laying down and lethargic. The cattle were in a paddock of approximately 500 weaners. Despite supportive care, most affected animals did not improve and died within three days. Deaths continued into mid-February, with affected animals found lying down and lethargic. At least 12 head died or were euthanised.

Although the property had previously managed several cases of botulism in their cattle with vaccination, this group of cattle had not been vaccinated. A phosphorus supplement was available and the cattle had been treated for internal and external parasites using a backline treatment. Notably, the weather had been particularly wet in the previous few weeks, with the area receiving over 1000mm of rainfall for January (average of 468mm).

Initial blood and faecal sampling of an affected steer and an affected heifer showed a possible bacterial infection and mild muscle damage in both animals. The faecal egg count was within normal limits, suggesting internal parasites were not the cause. Bovine Ephemeral Fever (BEF) and polymerase chain reaction (PCR) testing for BEF virus was negative, and the BEF serological test for antibodies was positive in both animals. This indicates previous exposure, but not current infection with BEF virus. Weaner cattle within the National Arbovirus Monitoring Program activity zone commonly have antibodies against the BEF virus.

The Darwin Regional Veterinary Officer attended the property and performed an autopsy on a euthanised steer and a heifer which had died 12 hours previously. The heifer was one year old and in good condition. A fragment of bone was found in the omasum (third stomach), and a full range of samples were collected. While there was marked decomposition of the tissues of the heifer, no obvious abnormalities were observed on histology. The steer was two years old and in good condition. It had been sitting for 24 hours, was bright in demeanour and there was no evidence of tongue paralysis. Similarly, fragments of bone were found in the rumen during autopsy. This steer also displayed antibodies to BEF, though tests of splenic tissue from the heifer and blood from the steer indicated that the exposure was not recent.

Based on a combination of the clinical signs, history of botulism on the property, lack of vaccination of the affected animals, the presence of bone fragments in the gastrointestinal tract and no significant findings on microscopic histology, a diagnosis of botulism was made. Botulism toxicity is very difficult to prove conclusively but it is a major risk to NT cattle.

Given the recent wet weather and large wildlife population in the area (agile wallabies), it is likely the unvaccinated weaner cattle had access to cattle or wildlife carcasses with the botulinum toxin produced by the bacterium, *Clostridium botulinum*. The bacteria can multiply rapidly in carcasses with the warm and moist conditions of the Top End wet season and produce spores that can survive in the environment for years as a future disease threat. Despite mineral supplementation cattle will often persist in carcass consumption exposing themselves to a major source of toxin.

There is no treatment for botulism in cattle and most affected cattle are euthanised or die of respiratory failure. In this case, advice was given to immediately vaccinate the remaining cattle with botulism vaccine and to ensure that carcasses were removed from paddocks and buried or burnt where possible. Mortalities on the property ceased two weeks after the cattle were vaccinated which is possible further proof of botulism. The property has now implemented a vaccination program for future young stock.

Acute neurological disease in grower pigs fed vegetable food scraps

In late March, after several weeks of particularly wet and humid weather, a hobby farmer outside Darwin reported acute neurological disease in a litter of 3 month old grower pigs. The pigs were normal when fed in the evening, but the next morning 6 out of 10 young pigs were found lying on their sides and paddling with their legs. The six adult pigs in the same and neighbouring pens were unaffected. There had been no recent management changes on the property.

On examination, the affected pigs were somewhat aware of their surroundings, and were able to weakly struggle when restrained, but were unable to get up. They exhibited severe whole body tremors and appeared particularly sensitive to noise and movement. Two affected pigs were euthanised and autopsy was performed. Both piglets were in good body condition, with stomachs full of mixed material consisting of foetid brown mashed material including various vegetables and fine roots. Remaining intestinal tracts of both pigs were full of normal contents. The pigs were normally hydrated, with abundant urine in their bladders.



Figure 2. Recumbent pig

Blood chemistry analysis did not show any significant changes, with electrolytes, minerals and kidney and liver parameters within normal limits. Both grower pigs showed an increase in the number of white blood cells that respond to bacterial infections. On histological examination, a mild to moderate inflammation of the brain was observed in both pigs. A culture of swabs taken from the brainstem at necropsy from both pigs was negative, including in culture media specific for *Haemophilus parasuis* (Glässers Disease – which can cause convulsions), and there were no systemic lesions suggestive of septicaemia. Infection with exotic Aujeszky's Disease was excluded via testing of multiple tissue samples at the Australian Animal Health Laboratory in Geelong, Victoria.

On questioning, the owner reported that they had ceased feeding the piglets a weaner pellet ration a few weeks previously, as the stored food had become mouldy. The current ration for the piglets and adults had consisted of scrap food sourced from a local Foodbank, which was collected every three days and stored in a cool room on the property. These scraps consisted of a various types of fruit, vegetables and bread, and given the recent high humidity, it is likely some of the scraps were mouldy. This feed is permitted and is not defined as 'swill'.

Based on clinical history, histological evidence and access to feed scraps which were likely mouldy, a diagnosis of toxicity due to tremorgenic mycotoxin was made. Mycotoxins are toxic substances produced by a fungus. Tremorgens are mycotoxins which can produce tremors or seizures in animals which consume toxic amounts of contaminated foodstuff.

Advice was given to immediately discard the remaining food scraps and treat the affected pigs with supportive therapy. 24 hours after the first signs were observed, the owner was surprised to find the remaining 4 affected pigs had made a complete recovery; this is consistent with exposure to a sub-lethal dose of tremorgenic mycotoxin. The owner has since commenced feeding a commercial grower pig pellet ration and there have been no further issues on the property.

Feeding of swill - food scraps which contain meat, meat products or anything that has been in contact with meat is not permitted and can cause extoic diseases in pigs, which may also infect other livestock. Feeding swill to pigs is believed to have caused the outbreak of Foot-and-Mouth (FMD) disease in the UK in 2001.

In addition to FMD; Classical and African Swine Fever and Transmissible Gastroenteritis can be carried and transmitted by feeding swill to pigs.

If you notice any unusual symptoms in your pigs, contact your Regional Biosecurity Office to arrange investigation or report it to the Emergency Animal Disease Watch Hotline 1800 675 888

ALERT: Akabane risk to cattle herds in Central Australia

Akabane virus causes a disease which results in abortions, stillbirth and deformities in the foetus of livestock. It primarily affects cattle and is transmitted by the biting midge (*Culicoides brevitarsis*).

In May 2018, Akabane virus exposure was detected in the sentinel cattle herd at Arid Zone Research Institute (AZRI) in Alice Springs. Akabane has not been detected in sentinel cattle in the Alice Springs region since 1974, when 60% of the sentinel cattle tested positive. At that time, insect trapping did not identify the biting midge and therefore other vectors may have been involved in the transmission of the virus between these cattle.

Since 1975, sentinel cattle at AZRI have been monitored continuously for Akabane virus exposure and inspect traps have been set to monitor the presence of potential Akabane insect vectors. For the past 43 years, there has been no evidence of Akabane exposure or the presence of the biting midge, *Culicoides brevitarsis* at AZRI. This is also supported by the negative Akabane results from serosurvey cattle on pastoral properties which have participated in the National Arbovirus Monitoring Program (NAMP). Information on NAMP can be found at <https://www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-arbovirus-monitoring-program/>

Cattle producers are being asked to monitor calves born to cows and heifers this year for any symptoms consistent with Akabane disease and to participate in the NAMP program to determine whether their herd has been exposed.

Human infection with Akabane virus has never been reported.

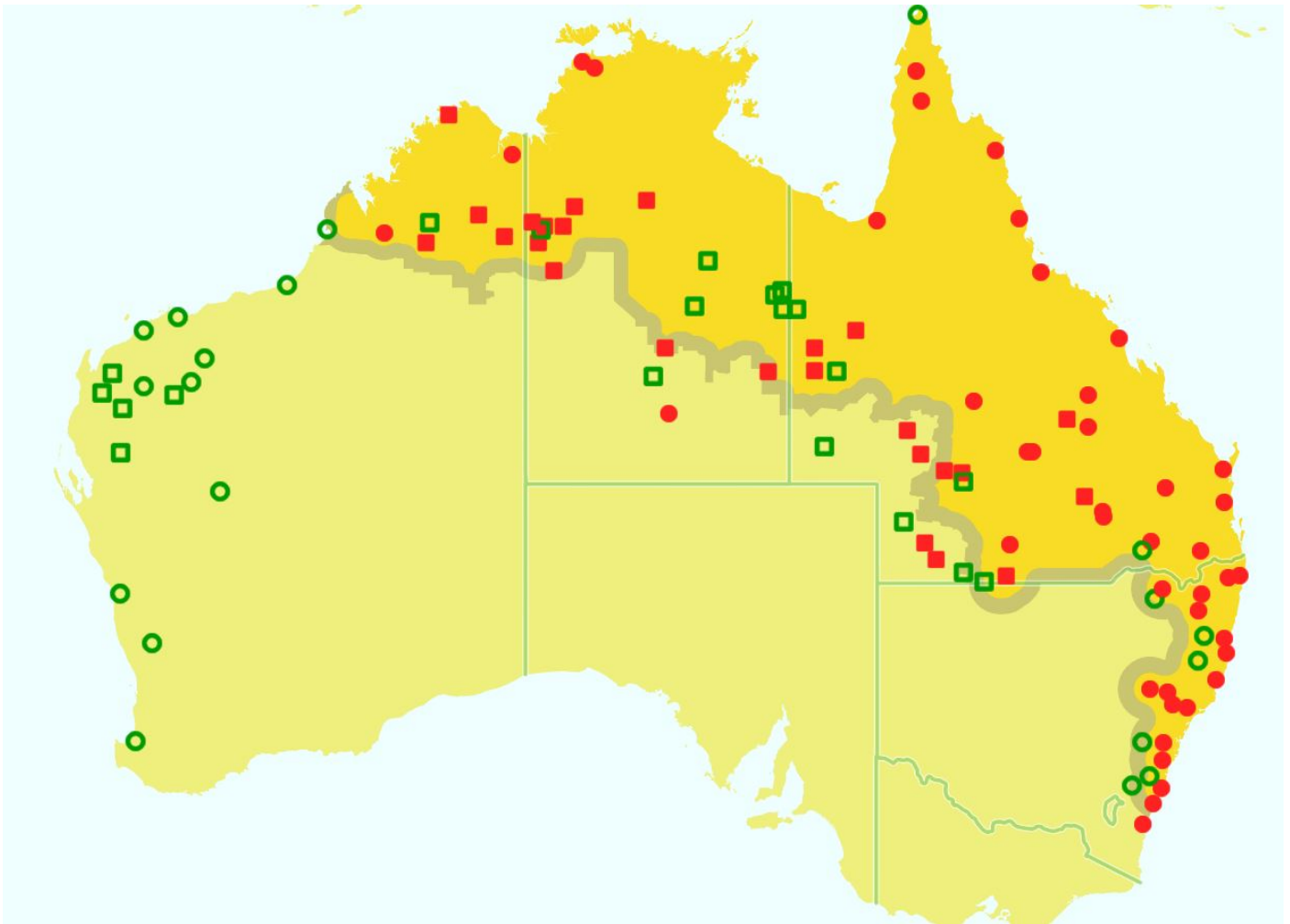


Figure 3. Akabane exposure distribution in 2016/2017 based on sentinel and serosurvey herds

Symptoms

No clinical signs are seen in adult cattle. Infection of cattle results in a transient viraemia causing a rise in Akabane antibodies. It affects the nervous system of the foetus in pregnant females.

The disease in calves appears as:

- Abortions at any time with a combination of the following:
 - early infection of the **foetus** results in calves born with arthrogryposis (deficiency of the cerebral cortex part of the brain leading to congenital joint contracture in two or more areas of the body with failure of muscle development). The condition is commonly referred to as 'Crooked Calf Disease'. Hydranencephaly (replacement of brain tissue by a fluid-filled sac) may also occur.
 - infection at **3-4 months** foetal age shows hydranencephaly only in calves. The condition is commonly referred to as 'Dummy Calf Syndrome'. Calves can rise and walk, but are blind, have no basic reflexes and lack intelligence.
 - infection at an older foetal age (**5-6 months**) results in calves with arthrogryposis (due to the failure of muscle development). These skeletal deformities in more advanced pregnancies are the first seen in an outbreak.

There may be calving problems due to calf limb deformity. When born alive, their teeth, coat and hooves are fully mature but they are small, underweight, weak and often unable to stand.

Infection and immunity before pregnancy can occur in areas where the vector is present, so no signs of the disease are seen.

If you have calves with these symptoms, contact your Regional Biosecurity office or private vet to investigate. Blood samples can be collected from other cattle in the herd to identify whether the herd has been exposed to Akabane virus.

How it is spread

The disease is transmitted by blood-feeding insects, mostly *Culicoides brevitarsis* (biting midges), but other vectors could exist. Consequently, Akabane is endemic in the northern regions of the NT with a similar distribution to the Bluetongue Virus (BTV) which shares the same vector.

When suitable weather conditions allow the midges to extend their normal range into areas with susceptible animals, and these animals have not previously been infected, clinical signs may be seen in the next calving season.

Monitoring

The National Arbovirus Monitoring Program (NAMP) monitors the seasonal distribution of not only BTV, but also Akabane virus and BEF. Younger animals (less than 18 months of age) are bled to determine the exposure of the herd in the most recent season.

Diagnosis of Akabane virus can often be made by clinical signs in the calf and can be confirmed by antibodies in the blood of the calf, cow or heifer.

Control

There are no options for treatment or control because of the nature of the disease and the method of disease spread. If Akabane is endemic in an area, breeding stock should be introduced to the area at an early age to gain immunity.

Participating in NAMP provides information about the presence or absence of the midge which transmits the Akabane virus, as well as the insect vectors for BEF and BTV. This can be used to inform the cattle industry more accurately on the location of the risk, and improve awareness for the disease and ensure that suspect cases are investigated by government or private veterinarians. The consequence of the disease on calving can have a significant economic impact on a pastoral property.

Review of the Australian Standards for Export of Livestock

The Department of Agriculture and Water Resources has commenced a review of the [Australian Standards for the Export of Livestock \(ASEL\)](#). The review will be conducted in 3 separate stages with each stage taking several months.

Stage 1 related to the format and content of ASEL. Nineteen submissions were received from individuals, businesses, industry, animal welfare organisations and government departments. The committee will use the submissions to recommend format improvements for the standards and set the direction for the rest of the review in **Stage 2** and **Stage 3**.

Submissions can be viewed at <http://www.agriculture.gov.au/animal/welfare/export-trade/review-asel>

The ASEL review is important because all cattle and buffalo destined for live export must comply with ASEL. Of note, ASEL sets the identification, pregnancy testing and spaying standards for export cattle and buffalo.

There has been ongoing concerns raised about cattle not being adequately identified and their pregnancy testing status being incorrectly reported. NT Government currently administers the accreditation of non-veterinarians who pregnancy test NT cattle and buffalo for export. The ASEL review provides the opportunity for feedback from stakeholders; including producers, agents, exporters and veterinarians on whether State and Territory Government agencies should be involved in the accreditation process under ASEL as well as the ability to be involved and provide feedback on any other ASEL component to influence the outcomes of the review.

ASEL supports continued live export market access, minimisation of adverse welfare outcomes and risks to industry.

Northern Australian Biosecurity Surveillance (NABS) project update

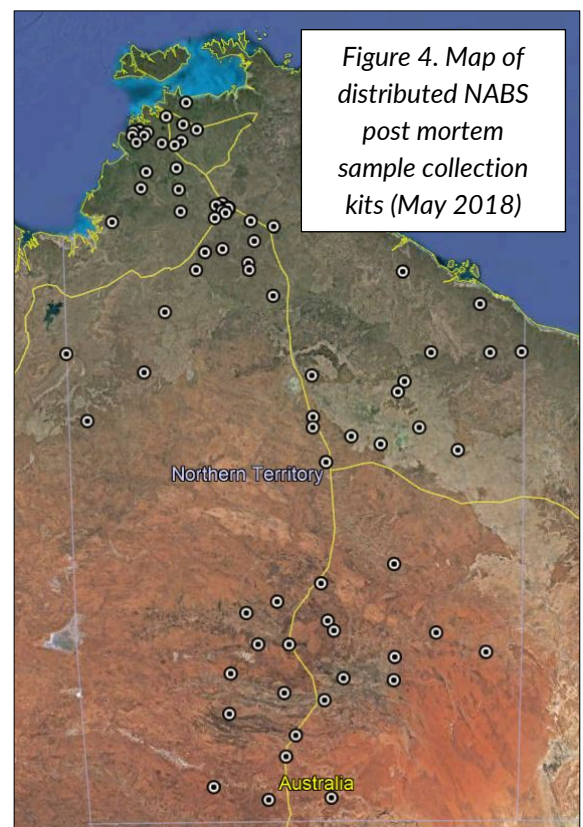
The Northern Australia Biosecurity Surveillance (NABS) project was formed in 2016 with funding from the Australian Government Agricultural Competitiveness White Paper. It is a collaboration between the Commonwealth and Queensland (QLD), Western Australia (WA) and NT Departments of Agriculture and Animal Health Australia. Current projects relevant to NT producers include:

Post mortem sample collection kits

- 11 pastoral properties in the NT are being provided with a post-mortem sample collection kit during the annual property visits undertaken by the Livestock Biosecurity team. This kit can be used to collect samples for laboratory diagnosis in the event that livestock get sick or die.
- 80 kits have so far been distributed to pastoral properties in addition to the vets across the NT
- if you have not yet received a kit for your pastoral property, contact your regional Livestock Biosecurity Officer.

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



Significant Disease Investigation (SDI) vet network

- the SDI vet network is a network of private veterinary practices, veterinary laboratories and government veterinarians who work in northern Australia.
- the network aims to increase the number of investigations, as well as improve sampling and reporting outcomes of SDIs in cattle conducted across the north to benefit producers.
- the network offers vets access to subsidies to undertake eligible SDIs, post-mortem kits, case assistance and professional development and networking opportunities.
- the network was launched in February 2018 with the first NABS SDI Masterclass held in Townsville on 23-24 February 2018. The workshop focused on priority animal diseases for northern Australia and investigations of respiratory disease, vesicular disease and skin diseases and was attended by 35 representatives from across private veterinary clinics, veterinary laboratories and government-based animal health surveillance streams in northern Australia.
- a second NABS Masterclass was held in Alice Springs on 22 March 2018 focusing on reproductive disease and calf loss investigations.

Figure 5. Vets at the NABS SDI Masterclass held in Townsville in 23-24 Feb 2018



L to R Front Row: Lee Taylor, Peter Trembath, Jonathon Lee, Nina Kung, Beth Cookson, Lorna Melville, Sue Fitzpatrick, Bill Tranter, Max Woods, Jack Daniels **L to R Behind:** Ian Braithwaite, Dave Forshaw, Kevin Bell, Peter Lynch, Justin Little, Derek Lunau, Rachael O'Brien, Regan Lynch, Libby Harriman, Lisa Stevenson, Trevor Smith, Graham Mackereth, Ryan Cockrem, Ed Butterworth, Hamish Brett, Tristan Jubb, Ian Langstaff, Peter Letchford, Zane Squarci, Dave Morrell, Brendan Briefies, Toby Wass

Moving horses and livestock below the tick line

Under the *Livestock Act*, all horses and livestock are required to be treated for cattle tick under the supervision of a Livestock Biosecurity Officer BEFORE any movement commences.

You must give at least three days notice (72 hours) and you must then move the horse no more than two days after the treatment.

The cattle tick line is located at Dunmarra. These conditions apply to all stock including cattle, buffaloes, horses, sheep, goats and camels. The reason for this regulation is to prevent the spread of cattle ticks.

For livestock moving out of the Parkhurst Zone, the Parkhurst cattle tick line is located at Pine Creek. These conditions apply to all stock including cattle, buffaloes, sheep, goats and camels except horses and donkeys which must be treated before moving over the cattle tick line at Dunmarra or the border to WA or Qld.

Animal Biosecurity Services	WEEKDAYS (no GST) - FEES	WEEKEND & PUBLIC HOLIDAYS - FEES
Cattle tick inspection and supervision of treatment *	\$46.00 set visit fee + \$1.15 per head	\$103.00 set visit fee + \$1.15 per head
Weekend Horse tick inspection & treatment (No Fee for weekday)	N/A	\$149.00 set visit fee + \$1.15 per head
Supply Health Certificate for interstate livestock movement	\$33.00 per certificate	\$66.00 per certificate
Supply Property of Origin Health Declaration	\$33.00 per certificate	\$66.00 per certificate
Investigations to follow up breaches of the <i>Livestock Act</i>	\$34.00 per half hour	N/A
<i>* if a tick inspection is for interstate movement a health certificate charge of \$33.00 will also be added</i>		

Note: Payment by Credit Card is required at time of service.

Why are there no charges for horses during the week?

Horses are a secondary host and low risk species for cattle tick. Inspection and treatment for cattle tick is undertaken to protect the cattle industry. Horses are moved frequently within the Territory for work and events and will still be required to undergo inspection and treatments to meet movement requirements. Fees will only be charged for inspection and treatment of horses on weekends and public holidays.

What can you do to help prevent the spread of cattle tick?

- follow correct transport practices when moving animals on and off your property
- contact your local Livestock Biosecurity Officer for animal inspections or supervised treatments.

Three days (72 hours) notice is required for all horse sprays and livestock dipping.

Bookings are made by contacting the Livestock Biosecurity Officer in your Region:

<p>Darwin</p> <p>Regional Livestock Biosecurity Officer 08 8999 2034</p> <p>Livestock Biosecurity Officer 08 8999 2030</p>	<p>Katherine</p> <p>Regional Livestock Biosecurity Officer 08 8973 9767</p> <p>Livestock Biosecurity Officer 08 8973 9765</p>
<p>Tennant Creek</p> <p>Principal Livestock Biosecurity Officer 08 8962 4458</p> <p>Livestock Biosecurity Officer 08 8962 4492</p>	<p>Alice Springs</p> <p>Regional Livestock Biosecurity Officer 08 8951 8125</p>

For more information visit the Department of Primary Industry and Resources website (<https://nt.gov.au/industry/agriculture/livestock>).