

# Animal Health

DEPARTMENT OF PRIMARY INDUSTRY AND RESOURCES

## November 2019

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## Livestock disease investigations

The Department of Primary Industry and Resources (DPIR) provides 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 free of charge. 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 as part of the Northern Australia Biosecurity Surveillance project.
- Subsidies 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 is collected for 'Mad Cow' exclusion testing.

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

From July-September 2019, 35 livestock disease investigations were conducted to rule out emergency diseases or investigate suspect notifiable diseases across the Northern Territory (NT).

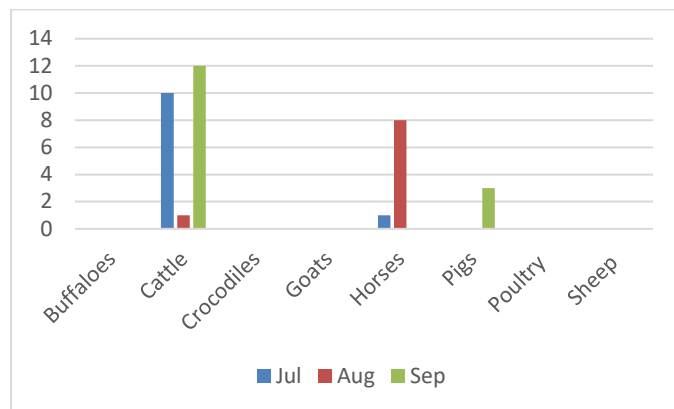


Figure 1: Livestock disease investigations in the NT, July to September 2019

# The Biosecurity continuum: How livestock industries are protected from exotic disease



Images (above): Megan Pickering, Veterinary Officer (Katherine region) travelled to Nepal earlier in the year to undertake training and enhance Australia's capacity to respond to the biosecurity threat of Foot and Mouth Disease (FMD).

Because we are an island nation, Australia is able to remain free from many of the serious animal diseases found elsewhere in the world. This status is important to our ability to export live animals and their products, and is protected through high quality animal health surveillance activity, and stringent quarantine laws. The threat posed by an African swine fever (ASF) outbreak to the Australian pork industry, is a biosecurity issue that is currently under the spotlight. This article aims to outline the various activities that contribute to maintaining biosecurity for livestock producers in the Northern Territory and across Australia.

At the Territory level, biosecurity is maintained through government and industry participation in all of the onshore areas shown in Figure 1:

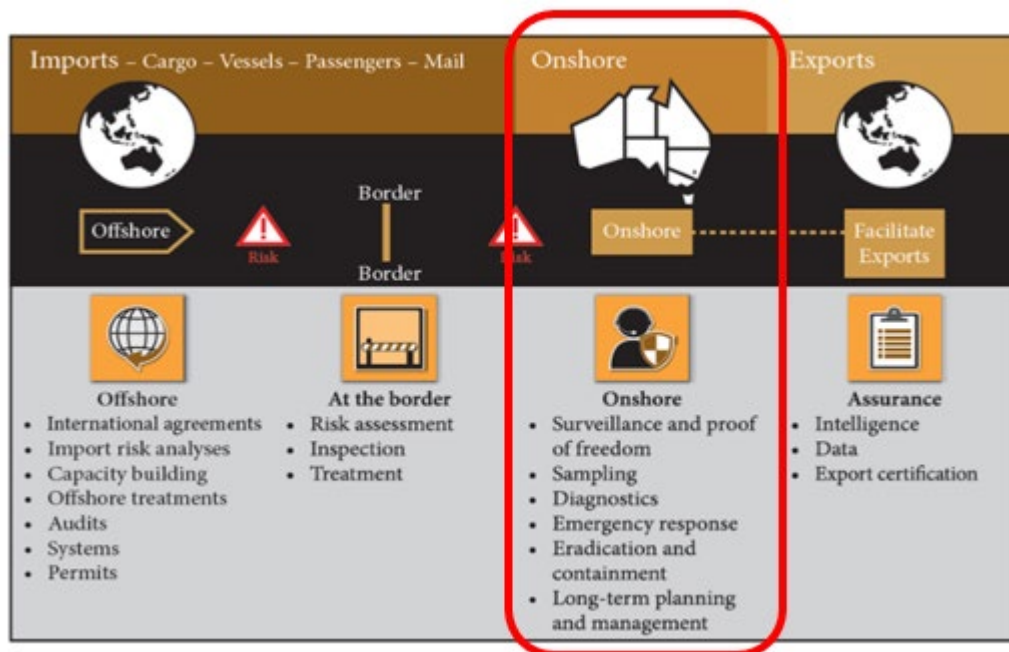


Figure 1: Graphic showing the activities that maintain the biosecurity continuum across Australia. Source: Agricultural White Paper, Australian Government

Surveillance and monitoring activities may be passive or active. Active or *targeted* surveillance involves collection of data for a specific purpose. In the Northern Territory (NT), DPIR Livestock Biosecurity Branch (LBB) staff are involved in a range of active surveillance activities, for national programs that target significant exotic diseases, including:

- NTSEP (National Transmissible Spongiform Encephalopathy program), to provide proof of freedom from mad cow disease;
- NAMP (National Arbovirus Monitoring Program) which measures the distribution and activity of insect-borne viruses of livestock;
- SWFSPP (Screw-worm Fly Surveillance and Preparedness Program) which monitors fly species, with the aim of early detection of SWF incursion;
- Swill-feeding and Restricted Animal Material (RAM) audits of livestock producers, to ensure ongoing freedom from diseases such as mad cow disease, foot and mouth disease and ASF.

These activities enable the NT to provide certification for live export, by allowing us to have scientifically defensible evidence to claim freedom from disease, as well as identifying new markets because of disease-free status.

*Passive* surveillance activities occur when we gather information for more general investigation, such as post mortem examination and diagnostics, in cases of unexpected stock deaths or disease. These activities help us to identify diseases that are new to Australia, so that a rapid response occurs. Quick control of an exotic disease will minimise disruptions to productivity caused by stock movement or export restrictions.

Staff within the Livestock Biosecurity Branch are engaged in regulatory activity, surveillance and emergency responses preparedness, such as dealing with exotic disease or a natural disaster, eradication and containment of disease, and long-term planning. This work includes:

- Property Identification Code registration and database management, which creates a mechanism for easy contact with livestock producers in an emergency response,
- Maintaining the waybill database, which creates a mechanism for tracking livestock movements in the event of an emergency response,
- Tick control, allowing for the separation of tick-borne diseases into zones, and
- Regulation of the domestic meat slaughter industry, control of use of chemicals such as 1080 and monitoring of chemical residues such as lead.

There are other border surveillance and risk-mitigation activities in Australia performed by agencies such as:

- The Commonwealth Department of Agriculture's biosecurity detector dogs, at air and seaports,
- Pre-border extension activities, such as providing information about biosecurity laws in a range of different languages to potential visitors to Australia, including seasonal workers such as mango pickers,
- Northern Australia Quarantine Strategy, which employs veterinarians and indigenous ranger groups, to undertake active surveillance activities across the northern Australian coastline and in remote areas. Feral pigs are a particular target for animal surveillance by these groups.

In all states and territories, the local Department of Primary Industry (or equivalent) is responsible for planning and preparedness, in the event that an exotic disease reaches our producers, or a feral target species, which may threaten primary producers. With the high level of threat to the Australian pork

industry, NT staff are currently engaged in specific disease response preparations for ASF. These activities include:

- Development of an NT-specific emergency response plan for ASF, in a nationally co-ordinated approach, which includes consultation with industry and specialists with experience in management of this disease;
- Awareness campaigns, targeted to primary producers, rural block owners who may keep pigs, pig hunters, travellers, seasonal workers and the general public;
- Specific disease investigation training and awareness for veterinarians, wildlife rangers and pig hunters;
- Increased active surveillance and regulatory activities, which may help to reduce the likelihood of infection, and severity or extent of a disease outbreak. This includes audits of swill feeding on properties and food businesses, and checking waste management facilities for compliance with NT legislation that aims to prevent pigs from accessing human food waste.
- Appointment of a feral pig policy officer, to draft specific policy around pig control options.

Ultimately, biosecurity is everyone's business. The quarantining of Australia to maintain our current level of disease containment is achieved through efforts at all levels of government, as well as personal awareness and accountability. It should, however, be recognised that although ASF is of current concern, continual vigilance is necessary to maintain disease freedom from a range of animal health threats such as foot and mouth disease, equine influenza or bird flu. The biosecurity continuum begins at the national border and continues to the property, where all producers should have a biosecurity plan. Information and resources on how to develop a personalised plan can be found at: <https://www.farmbiosecurity.com.au/>, or contact your NT Government Livestock Biosecurity officer for assistance and advice.

## Pig mortalities in the Darwin region



*Image: DPIR investigated pig mortalities in the Darwin region.*

ASF is an exotic viral disease of pigs that is currently in the national and international spotlight, and a primary focus for NT DPIR LBB disease surveillance activity. Although it does not pose a public health risk, ASF is a severe and highly contagious disease, causing 95-100 per cent mortality in pigs, with no cure or vaccine available. The virus survives in a wide range of conditions, and is resistant to cooking, freezing and



thawing. Because the disease can be easily spread from pig to pig by feeding virus-contaminated foods, there is currently a huge focus on both awareness around food products that can or can't be fed to pigs, as well as on monitoring and investigating unusual illnesses and deaths in pigs. There is no commercial pig industry in the NT, but at least 200 properties are known to keep pigs as pets or for home slaughter. The NT is also home to many millions of wild pigs, a population of particular interest when considering the risks of ASF infection in Australia.

In September 2019, a pig producer from Humpty Doo near Darwin, contacted the department regarding piglets that were dying. The herd consisted of two sows that had farrowed three to four weeks previously; one sow had two piglets and the other had eight. The owner first noted that two piglets had become very wobbly in the back legs; then, over the next three days, these animals collapsed and developed seizures. The owner euthanised the piglets on humane grounds. When another two piglets became sick with similar symptoms, the owner presented them to Berrimah Veterinary Laboratory (BVL), for examination and euthanasia.

The two piglets seen at BVL were in good body condition. The first animal examined was mildly affected; it was reluctant to move, knuckled over in the back legs, and collapsed easily. Some muscle tremors were seen, but this could have been shivering. The second piglet (from the original small litter of two piglets) was very unwell and unable to stand, but was conscious and appeared to be able to see. This piglet had thickened skin and swelling in the tissues around the neck, suggestive of oedema (fluid-swelling under the skin). Both piglets were euthanised and at the post mortem exam, a full range of body tissues was collected, for further testing.

A property visit was conducted by LBB officers to assess biosecurity measures. There was no reported access between wild and pet pigs, which would be very important to confirm in the event of an ASF outbreak. Another purpose for the visit was to investigate whether management or husbandry issues could have contributed to the disease event. The pigs were kept in a fenced enclosure within a ten acre block. The farrowing pens had concrete floors, automatic feeders, and were shaded by a tin roof. One corner of the enclosure had a concreted wallow area. Although cleaned regularly, the pigs (and piglets) were fed from the wallow, and also defecated and urinated there. Outside the farrowing pens and wallow area, the pigs had access to a dirt enclosure shaded by several large trees. The piglets were fed powdered milk, pig grower pellets, pineapples and vegetables.

Laboratory findings in the piglets included:

- Inflammation of blood vessels in the central nervous system (brain and spinal cord)
- Ulcers and erosions in the large intestine, with swollen and inflamed intestinal lymph nodes
- Inflammation of the liver
- Inflammation of the lungs
- Generalised depletion of the white blood cells.

The most likely cause of the major illnesses involving the large intestines and brains of both piglets is Oedema Disease. This is an inflammation of blood vessels called a vasculopathy, and is caused by a toxin-producing *E.coli* bacteria, which multiplies in the small intestine. The signs of disease seen in the large intestine were typical of Oedema Disease, and the piglets were approximately the right age for the condition. It is likely that the *E. coli* organism was introduced to the piglets through their recent mixing with the rest of the herd, or changes in intestinal bacteria as the piglets started eating food rather than exclusively nursing. However, signs of illness in other body tissues were also suggestive of a viral disease,

Porcine Circovirus 2 (PCV2), which is common in Australian pig herds, and is seen as a concurrent infection in outbreaks of various pig diseases. Infection with PCV2 was also confirmed through laboratory testing.

Although the signs of illness in the piglets were not particularly suggestive of ASF, it is possible for ASF to cause intestinal illness and a central nervous system blood vasculopathy. Therefore, the piglet tissue samples were extensively tested for infection with ASF and other exotic diseases at the Australian Animal Health Laboratory, with no findings of any emergency or exotic animal disease.

After reaching a diagnosis, the owners were contacted and recommendations regarding husbandry and management provided to decrease the risk of disease events recurring, especially in relation to PCV2. Recommendations included creep feeding to gradually introduce piglets to new food, maintaining a clean and healthy environment (separating food from faeces, and not feeding at the wallow), and reducing the impact of stressful events such as mixing litters and animals during the vulnerable stages of life. The owners were appreciative for the support from the department, the ability to have an extensive investigation performed, and the recommendations provided.

## Protect the Territory from ASF

### Feed your pigs right

Pig owners are reminded that feeding pigs meat scraps poses a serious risk to Australian biosecurity as ASF continues to spread rapidly throughout Eastern Europe and Asia.

It is illegal in every Australian state and territory to feed swill to pigs. Swill is the name for meat products or products that have come into contact with meat. Examples of swill include:

- pies and pasties
- sausage rolls
- pizza
- table scraps
- restaurant leftovers
- discarded cooking oils.

\* Non-Australian dairy products are also banned.

Feeding swill to pigs is one of the simplest ways that serious diseases can enter the food chain.

ASF is a highly contagious disease of pigs, and has the potential to severely threaten the Australian pork industry. The virus survives at a wide range of pH levels, is resistant to most disinfectants and remains active in meat products through freezing and thawing.

ASF does not pose a risk to human health.

If you notice any suspicious symptoms in your pigs, such as weakness, lethargy, reduced appetite, discharge and blotchy skin lesions, please contact the Exotic Animal Disease Hotline on 1800 675 888.

More information about how you can help keep the Territory ASF free can be found at [www.nt.gov.au/african-swine-fever](http://www.nt.gov.au/african-swine-fever)

## On-farm biosecurity is essential

- ASF is on our doorstep, strong biosecurity and hygiene practices are crucial.
- Farm biosecurity starts at the front gate. When entering a farm or production area use:
  - on-farm tools, boots and equipment if provided
  - a footbath for footwear
  - a suitable disinfectant, such as Virkon S or chlorine for disinfection of equipment.
- When you leave a farm, always
  - disinfect your boots, clothes, vehicles and any equipment you are taking with you.
  - Wash your clothes and equipment regularly to keep Australia clean.
- Strong biosecurity practices and hygiene are crucial. ASF can be spread by people on their skin, clothing, footwear, and in their hair.
- Always wash your hands with soap and water before and after handling animals.
- Overseas workers who have contact with pigs at home should wait a minimum of seven days or avoid having any contact at all with pigs in Australia.
- Overseas workers should not bring any clothes or equipment used with pigs in their home country to Australia.
- Know the signs – early detection is key. If you see something suss, call us. Report symptoms to the Emergency Animal Disease Hotline 1800 675 888.
- Protect your property - find resources to help keep your farm and pigs clean on the [farm biosecurity website](#).

# African swine fever



## Protect our pigs. Protect your property.

African swine fever (ASF) is a highly contagious disease of pigs that's spreading rapidly in Eastern Europe, China and South East Asia.

An outbreak of ASF in Australia would have a significant impact on pig health, pork production and will devastate Australia's pork industry.

The disease is spread by direct contact with infected pigs, contaminated vehicles, equipment or clothing and by feeding infected swill or meat scraps to pigs.

No vaccine or treatment is available. It's vital that we keep ASF out of Australia.

### Strong biosecurity practices and hygiene are crucial.

- ASF can be carried by people on their skin, clothing, footwear and in their hair. When you and your workers enter a farm or production area ensure you use:
  - on-farm tools, boots and equipment if provided
  - a footbath for footwear
  - a suitable disinfectant, such as Virkon S or chlorine, for disinfection of equipment.
- When you and your workers leave a farm or production area, always disinfect boots, clothes, vehicles and any equipment leaving the site.
- Always wash your hands with soap and water before and after handling animals.

### Overseas worker vigilance.

- Those who have contact with pigs at home should wait seven days before having contact with pigs in Australia or avoid having contact with pigs in Australia.
- Workers should not bring any clothes or equipment used with pigs in their home country to Australia.

### Know the signs.

Early detection is key to eradicating disease. Symptoms of ASF include:

- sudden death or death within one-two days
- blotching of skin, especially the ears
- loss of appetite
- huddling or hiding in corners
- diarrhoea, which may be bloody.

### Protect your property.

Find resources to help keep your farm clean on the Farm biosecurity website at [farmbiosecurity.com.au](http://farmbiosecurity.com.au)

**If it looks suss, call us 1800 675 888**





## Calf watch: *Brucella abortus* excluded in peri-natal death

A current investigation into causes of calf loss in extensively managed north Australian beef herds aims to establish causes of death in the immediate pre- and post-birth periods. It has been difficult to establish causes of calf death using traditional methods of observation, because calving cows are hard to find in large paddocks. Calf carcasses are similarly difficult to locate, owing to rapid decomposition and predation. Calf Watch<sup>1</sup> is a current DPIR Livestock Industry Development project, which uses birthing sensors inserted into the vagina of pregnant cows; an electronic calving alert allows researchers to locate calving sites when the sensors are expelled, collect dead calves for autopsy and tag live calves for further tracking.

In September 2019, researchers detected a calving cow, shortly after receiving the sensor alert. The foetus was only partly expelled through the pelvis, and staff manually delivered the dead calf. The carcass was submitted to the regional veterinary officer for autopsy, where the following findings were noted:

- Evidence of some foetal distress, bright red gums and a very large, swollen tongue
- The calf was normally developed and at term
- Unclotted blood was easily collected via direct puncture into the heart
- Lungs were solid and did not float in water, indicating that the calf had not taken a breath
- Kidneys and liver were moderately decomposed
- The heart, lungs, spleen, gastrointestinal tract and brain were significantly less decomposed.

Laboratory findings showed evidence of amniotic fluid inhalation (foetal or calf-bed fluids), indicating distress of the calf while it was still in the uterus. This finding is suggestive of dystocia (meaning the calf was stuck, and unable to be delivered without assistance) as the cause of death during the birthing process. However, the lung also showed evidence of inflammation, and possible involvement of bacteria. Therefore, culture of the lung, and exotic disease testing was requested at the Australian Animal Health Laboratory (AAHL) for *Brucella abortus* infection. *B. abortus* is a bacteria that may cause pneumonia in a calf foetus, and because it is not known in Australia, is a potential cause of infectious emergency animal disease.

Testing was also undertaken to rule-out viral causes of abortion. The calf blood was tested for antibodies to Bovine Viral Diarrhoea Virus (also known as Pestivirus) and several arboviruses (insect-borne infections) as shown in Table 1:

Arbovirus	Test	Result
Akabane	VNT	Negative
Bluetongue	ELISA	Negative
BVDV	AGID	Negative
EHD ELISA	ELISA	Negative
Palyam group	AGID	Negative

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1. Calf Watch - Developing a system to remotely monitor calving and study calf loss in extensive situations in northern Australia. T Schatz, K McCosker, M Wooderson, G Baily-Preston and R Boughton. Corresponding author: tim.schatz@nt.gov.au.

Histology (examination of tissue cells) ruled out infections that commonly cause problems in NT beef cattle and calves, such as Leptospirosis, vibriosis, *Tritrichomonas fetus*, Listeriosis, *Yersinia pseudotuberculosis* and *Neospora caninum* infections. The bacterial culture grew small amounts of two bacteria, including *Mannheimia haemolytica*, which is a cause of “Shipping Fever” pneumonia in adult cattle. Given the large amount of fluid that the calf had inhaled, it is likely that the bacterial growth represents a secondary infection of the lungs after death, and not a cause for the neonatal death. The referral testing at AAHL on the lung tissue was negative for *B.abortus*. This was established using a molecular diagnostic testing method with high reliability.

Investigation into the cause of death in this calf established that this was a simple case of dystocia, where the position of the calf in the uterus made it impossible for a normal, unassisted vaginal delivery to occur. Unless calving cows are intensively monitored, there will always be a proportion of calf deaths in the uterus. This occurs if the calf runs out of oxygen during a prolonged labour and delivery, because of disruption to the maternal oxygen supply through the umbilical cord. Eventually, the unborn calf needs to attempt to take a breath; if the head is still inside the uterus, foetal fluids will be inhaled and the calf will die shortly afterwards. However, despite the benign findings, this investigation is an important and useful example of passive surveillance, where DPIR researchers were able to rule-out an important exotic animal disease, as well as adding to the knowledge base around causes of neonatal calf death in the NT.

## Lead poisoning

Lead is a naturally occurring toxic metal. Its widespread use has resulted in extensive environmental contamination, such that lead poisoning in animals and people is of major concern worldwide. In veterinary medicine, lead poisoning following opportunistic or accidental ingestion, is most common in dogs and cattle. Lead exposure may have serious consequences for human health, particularly for young children. Even low levels of exposure can affect brain development, resulting in reduced intelligence, and behavioural changes such as shortened attention span and increased antisocial behaviour. These effects are believed to be irreversible. Because of the hazards associated with ingesting lead, Australian food-producing animals that have been exposed to lead sources, and may therefore pose a risk if their meat is eaten, are subject to movement and slaughter restrictions to ensure food safety and product integrity.

Lead is the most commonly reported source of heavy metal poisoning in livestock, with severely affected animals showing a variety of nervous system signs. These may include teeth grinding, blindness (stumbling, walking through fences or crashing into solid structures), muscle spasms, lack of co-ordination, head pressing in corners or against trees, and eye rolling. Signs of acute lead poisoning occur within 12-24 hours of consumption, with severely affected animals quickly dying from seizures and breathing paralysis. Lower level toxicity may occur more slowly, with animals surviving for several days; blindness, aimless wandering or staggering and gastro-intestinal upsets may be seen. These signs are not, however, specific to lead poisoning, and a diagnosis should be made by a veterinarian to rule out other causes of brain illness. Lead poisoning may present with signs that require tissue sampling and testing, in order to differentiate the illness from other conditions such as:

- tetanus (early stage)
- botulism (late stage)
- polioencephalomalacia (vitamin B deficiency)
- nervous ketosis

- infections of the brain
- other poisonings (e.g. salt, mercury or arsenic), and
- exotic diseases such as rabies and BSE (mad cow disease).

Cattle in the NT occasionally succumb to lead poisoning when they are able to access station dump sites containing discarded lead-acid car batteries. Exposure to sunlight and chemical corrosion of the batteries over time, leads to shattering of the chemical cell housing, so animals can easily access the lead. In a discharged battery, the lead is present as lead sulphate, a salt which is tasty to cattle and easy to consume. Other sources of lead poisoning may include mine tailings, water contaminated in lead-lined pipes or ground poisoning from contamination with materials such as sump oil or lead shot. Producers should make every effort to prevent animals accessing potential sources of lead such as metal dumps or tailings dams, as the consequences of lead exposure are long lasting and expensive. Station dumps should be securely fenced to prevent stock access, and discarded lead and other heavy metals should preferably be recycled through accredited metal recyclers, rather than discarded on site.

It is important to know that not all animals that have ingested lead will have symptoms; severely lead poisoned animals may simply be the sentinels which indicate that a herd has been exposed to a lead source. Some animals may have consumed some lead and show no symptoms, but their blood and tissue levels of lead may still be above the Maximum Level (ML) allowable under the Australian & NZ Food Standards Code. For this reason, if lead poisoning is diagnosed in a single animal on a property, further investigation and testing of herd cohort animals is likely to be necessary, to ensure that animals with lead contamination do not enter the food chain. 95 per cent of ingested lead is stored in the bones of the animal, from where it may be released at different times. This is why affected animals may be temporarily or permanently restricted from entering the food chain. DPIR livestock biosecurity officers and field veterinary officers are able to provide support and advice on herd management in the event that lead exposure is detected on your property.

## Cattle tick zones change

Following a review of the Territory's cattle tick management program, livestock owners are being asked to check cattle tick zones and movement restrictions as there have been changes to the cattle tick control and infected areas.

The Parkhurst infected zone now includes Kakadu National Park and the township of Jabiru.

The cattle tick infected zone has been updated to include four properties previously in the cattle tick control zone that are focused on live export markets and therefore have no requirement to remain within the cattle tick control zone to facilitate the domestic movement of cattle.

The [new map is available from the Northern Territory Government website](#).

Livestock owners can review [movement conditions by reading the factsheet](#).

Cattle tick is a serious pest in the NT, affecting many livestock including cattle, horses, buffalo, camel and goats. Parkhurst ticks (a strain resistant to commonly-used chemical treatments) were first detected in the NT in 1999.

An extensive survey will be undertaken in 2020 to assess the effectiveness of the Parkhurst infected zone and determine whether Parkhurst strain cattle tick has spread outside this zone or been introduced to other properties from interstate.

For more information, please see the [Northern Territory Government website](#).

## Moving horses and/or livestock below the tick line?



*Image: All horses and livestock are required to be treated for cattle tick under supervision before any movement commences.*

Under the *Livestock Act 2008*, all horses and livestock are required to be treated for cattle tick under the supervision of a livestock biosecurity officer BEFORE any movement commences.

**72 hours notice** is required to ensure the availability of a livestock biosecurity officer for all horse sprays and livestock dipping.

## Contact the Livestock Biosecurity team

<b>Darwin</b>		<b>Katherine</b>	
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
<b>Tennant Creek</b>		<b>Alice Springs</b>	
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](http://nt.gov.au/industry/agriculture/livestock)