

Animal Health News

from the Northern Territory

Busy Wet Season at Berrimah Veterinary Laboratories

During this wet season, Berrimah Veterinary Laboratories has investigated a plethora of important cases involving production animals (both pastoral and aquaculture), wildlife and companion animals. Melioidosis, caused by the bacterium *Burkholderia pseudomallei*, figured prominently, with unusually high numbers of submissions involving the bacterium causing disease in goats or dogs. In the goats, in four separate submissions from different herds, the main manifestation of the disease was infection of the wall of large arteries in the chest or neck, resulting in necrosis and rupture of the vessel wall and acute fatal haemorrhage. In an additional goat, disease manifested as brain infection with neurological signs of lameness progressing to circling. In one fatal canine case, melioidosis resulted in lung and brainstem infection. In a second canine case there was abscessation of part of the testis, and the dog had an extremely high antibody titre to the organism.

There were a few unusual isolations of *Pasteurella multocida*, a gram negative bacterium with a broad host range that normally harmlessly inhabits the upper respiratory tract and mouth. In one case, the organism was isolated from the liver, spleen and joint fluid of a colostrum-deprived buffalo calf with septicaemia and terminal dingo attack. In a captive Northern Quoll, which is an endangered species, the bacterium caused septicaemia and severe heart damage.

Being the time of year for hatching of crocodiles on farms, there have been many submissions of hatchlings with retained yolk sacs infected with a variety of environmental

bacteria. Also typical for this time of year, the moist conditions have resulted in several submissions of ducks and chickens with botulism.

On the aquaculture front, investigation of the loss of thousands of close to market size farmed barramundi from a single pond in which there was a failure of aeration revealed the unprecedented finding of partial chronic eversion of the caudal stomach in all fish that died. It is thought that the eversion of the stomach was a pre-existing problem that had gone undetected until low oxygen levels resulted in ischaemic necrosis and overgrowth of anaerobic *Clostridium spp.* bacteria in the everted stomach wall, resulting in death due to toxemia. Another more common syndrome, necrotic enteritis and peritonitis, continues to be a significant problem in market size barramundi on some farms. The cause of this condition remains obscure but appears predisposed by circumstances as varied as poor water quality, high stocking density, feed composition, feeding practices and intercurrent parasitism. There is no effective treatment.

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Of importance to both a fledgling industry and native amphibians in the region, a group of 10 magnificent tree frogs, that formed the core of a breeding group supplying juvenile frogs to the pet industry, died over the period of a week. The frogs were adults that had been in captivity long-term; six were found dead with no previous signs or observed to be lethargic a few hours before being found dead, sometimes with reddening under the skin or bloody discharge from the mouth, while the final four surviving frogs were euthanised when observed to be sick and to have skin ulcerations. Histological findings were very suggestive of ranavirus infection, a virus implicated in wild amphibian population declines elsewhere but that has not previously been found in the Northern Territory. The virus has been isolated and visualised using electron microscopy and confirmed as a ranavirus by molecular techniques.

Adenoviruses have recently figured prominently as well. Infectious canine hepatitis, caused by canine adenovirus type 1, was diagnosed on post-mortem and histopathology in an adult dog from a property that had several unexplained canine deaths over the past months. This case serves as a reminder that these serious canine diseases are still out there, waiting to strike when proper vaccination protocols aren't followed. Adenovirus infection of the liver was also tentatively diagnosed, based on the histological finding of typical viral inclusion bodies, in a group of captive juvenile bearded dragons that experienced multiple sudden deaths in a short period of time.

Sentinel cattle again yielded isolations of bluetongue virus in the Top End this wet season. The disease does not occur in sheep production areas due to the lack of efficient culicoides vectors further south. Close monitoring of this virus is essential, as it could be devastating to the sheep industry. There has also been lots of bovine ephemeral fever viral activity, demonstrated by development of antibodies in many sentinels, and clinical cases in some herds, with virus identity confirmed by nucleic acid analysis using polymerase chain reaction (PCR). It is the usual time of year for heavy activity of both these viruses, due to high culicoides vector densities combined with slight drying of the environment to allow breeding. Sentinel chickens have revealed flavivirus activity (Murray Valley encephalitis and Kunjin viruses) in the southwest Katherine region and at Beatrice Hill Farm, in rural Darwin. Again, this is the usual time of year for activity of these viruses, coinciding with high mosquito breeding activity. This flavivirus monitoring information is used by human health departments to issue warnings regarding possible human exposure to these zoonotic viruses.

Research-wise, the Virology section at BVL is close to the conclusion of their Australian Biosecurity Cooperative Research Centre project which will result in description of the full-length genome of new bunya and rhabdoviruses, along with successful technology transfer of selective/subtractive PCR technique, primer design and cloning capability.

Cathy Shilton
Veterinary Pathologist
8999 2122

**Articles on topics of interest and letters
to the editor are invited.**

Please mail contributions to:
AHNNT Berrimah Veterinary Laboratories

DPIFM
GPO Box 3000
Darwin NT 0801
or fax to (08) 8999 2024
or email to ahnnt@nt.gov.au

Katherine Regional Roundup January—March 2008

There have been a range of problems experienced by goat herds in the Katherine region. One property with 700 feral goats reported depression and difficulty urinating in a number of male animals. Post-mortem showed urinary calculi in the kidney, haemorrhage surrounding the urethra and a necrotic penis. One property reported a ten per cent loss in the herd with no apparent age or sex discrimination. Illness was observed following a history of significant rainfall with goats developing lethargy and respiratory symptoms including nasal discharge and cough. Another property with 1500 feral boar goats reported losses during the "build up". Some of the goats had pre-existing symptoms consistent with pneumonia following transport. The goats were in good condition with supplement and recent treatment with anthelmintics. Eagles and wild dogs have also been reported to be killing the kids born in exposed environments.

There have also been problems experienced in small poultry flocks. Botulism was diagnosed in a number of flocks where chickens displayed paresis or paralysis of the legs or were found dead. Diagnosis was confirmed using the mouse protection test. All flocks had access to decaying vegetable scraps. Another poultry owner reported depression, lethargy, inappetence, conjunctivitis and nasal discharge in the flock. A similar syndrome had occurred on the property approximately one year previously. Infectious coryza due to *Haemophilus paragallinarium* was the most likely cause of disease.

A number of feral bulls destined for export developed lethargy, depression, lameness and respiratory symptoms following mustering and transport. Several post-mortems performed on the bulls during the past two seasons has supported a diagnosis of bovine respiratory disease.

Three properties with small cattle herds were monitored regularly and reported stillbirth, abortion and weak calves. One property was found to have evidence of recent infection with bovine viral diarrhoea virus exposure. Another property showed several cows with Neospora titres.

Pyrollizidine alkaloid toxicity continues to be an issue for horse owners. Horses located on properties with access to the yellow rattlepod plant continue to be at risk of "walkabout disease". Various species of *Crotalaria spp.* grow throughout the Top End, but *C. crispata* and *C. ramisissomare* are believed to be associated with significant disease in the Katherine Region. The plant toxins cause cumulative and irreversible damage to the liver. Horses have elevated liver enzymes, and display signs of depression and weight loss. Land management and supplementation reduce the incidence of disease.

A number of properties in the southern Katherine region reported significant deaths in the cattle herds. One property reported up to 200 deaths in heifers. The property had experienced a similar problem in the previous year where 65 deaths were recorded in the same paddock. Cattle were vaccinated for botulism and no supplement is provided to cattle on the property. Clinical signs were consistent with botulism.

Several pastoralists have reported symptoms consistent with bovine ephemeral fever (3-day sickness) in cattle.

Sue Fitzpatrick
Regional Veterinary Officer
8973 9716

Babesiosis in New Caledonia attributed to imported Australian cattle

In early March of this year, cattle deaths attributed to tick fever were reported by authorities in New Caledonia.

In Australia, tick fever in cattle can be caused by *Babesia bovis* or *Babesia bigemina* (babesiosis), or *Anaplasma marginale* (anaplasmosis). The disease is transmitted by the cattle tick (*Boophilus microplus*) and disease generally only occurs in areas of Australia where the tick is found. Cattle can be vaccinated against this disease using a live vaccine. Vaccines contain attenuated strains of *B. bovis* and *B. bigemina* as well as *A. centrale*. Occasionally highly susceptible adult animals may develop serious clinical disease following vaccination.

Imidocarb is the drug of choice for treatment and in appropriate dosage is effective against both *Babesia spp.* and *Anaplasma spp.*

The cattle tick had been introduced into New Caledonia in the 1950s, but the island had managed to exclude tick fever. Protocols for import of cattle require that the animals are sourced from tick free areas and as an additional precaution they must be treated for tick fever using imidocarb. Bulls (43) had been imported from Australia into New Caledonia in November 2007, and instead of receiving imidocarb, they were vaccinated. To date, outbreaks of disease have occurred on four farms with 11 cattle deaths. Babesia has been confirmed on blood smears or brain smears.

It is suggested that the vaccine derived *Babesia spp.* organisms are being transmitted to ticks, which in turn infect in-contact local cattle. Containment of the disease will be through mass treatment with imidocarb and setting up exclusion zones for cattle farms that have been in contact with the 43 Australia-imported animals. Buffer protection and surveillance zones will surround the exclusion zones. For the next two months, no animals will be introduced into New Caledonia. In order to eliminate infected ticks, pastures will be closed to grazing for up to 10 months.

Lois Small
Parasitologist
8999 2245

CVO AHNNT April 2007

There has been good progress with the eradication of equine influenza in New South Wales and Queensland. The last known cases were in December 2007. During January, February and March there has been intensive surveillance testing in the previously infected and buffer areas in New South Wales and Queensland with no disease detected. From April to June there will be the final higher intensity surveillance in the other areas of Australia to exclude equine influenza in horses with fever, coughing and nasal discharge. Investigation of clinical cases especially if there are a number of horses with respiratory disease is important.

Australia has been declared provisionally free of equine influenza (April 6, 2008) and should regain international freedom from equine influenza status in December 2008.

http://www.outbreak.gov.au/pests_diseases/pests_diseases_animals/equine_influenza/docs/ei_summary_freedom.doc

I urge all vets to exclude equine influenza in horses with fever, coughing and nasal discharge.

The livestock legislation is being amalgamated into a single Act and will be introduced into the Legislative Assembly during the middle of the year. The new legislation should be in place by the end of 2008.

Brian Radunz
Chief Veterinary Officer
8999 2130

Alice Springs Region

The region experienced only patchy summer rainfall and seasonally low growth. This has resulted in an increase in cattle movements interstate as properties 'lighten off' prior to winter. Some properties in the southern Alice Springs district are now experiencing their fifth successive year of drought.

One property reported 'losing' a large number of breeder cattle and botulism was suspected. Unfortunately in the absence of any carcasses it was impossible to confirm.

The regional veterinary officer carried out a follow-up investigation on suspected *Ipomoea spp.* poisoning of horses on a property on the Barkly. The investigation established that the clinical findings were consistent with the horses having been exposed to both *Swainsona spp.* (poison morning glory) and *Indigofera spp.* (Birdsville indigo).

Reports have been received from a wildlife rescue agency of an increased prevalence of psittacine beak and feather disease (psittacine circoviral disease) in galahs in the Alice Springs area.

Investigations on one property resulted in the culture of *Salmonella oranienburg* from the intestine of a yearling which died from septicaemia. The significance of this finding was not established.

Peter Saville
Regional Veterinary Officer
8951 8181

Animal Welfare: What's new this year

Dr. David Ritchie has been appointed as the new Chief Executive Officer of the Department of Local Government, Housing and Sport which administers the Animal Welfare Act.

The Animal Welfare Act review has been finalised but the review is confidential at this stage and a draft will be made available in the near future. The timeframe for this process was due by the end of 2006. The review of the Animal Welfare Branch has not been finalised yet.

The World Society for the Protection of Animals campaign against long distance transport of livestock was launched in February 2008. The formation of the Livestock Transport Taskforce was established to facilitate a coordinated Australian industry response to the campaign and includes representation from the farming, road transport, livestock export, meat and associated industries.

This coincided with the release of the Standards and Guidelines for the Land Transport of Livestock and an associated Regulation Impact Statement which have been reviewed by all relevant stakeholders. A public consultation period will commence on the 29th March 2008 and will close on the 27th May 2008.

Plans are now underway by Animal Health Australia for the development of Standards and Guidelines for Cattle and Sheep. The Australian Animal Welfare Strategy/Animal Health Australia plan is to have all model codes of practice for the welfare of animals converted to standards and guidelines by the end of 2010 but is unlikely this will be achieved by that date with the current level of resources.

Mauricio Perez-Ruiz
Senior Veterinary Officer
8999 2038

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**Berrimah Veterinary Laboratories actively asks
customers for feedback on its services.**

Please direct any comments to: Officer-in-charge, Dr Lorna Melville
Phone **8999 2251**

Suspected *Solanum* spp. poisoning in extensive beef cattle

Overview

In November 2006, 24% of a breeding cattle mob on arid rangeland south of Alice Springs were poisoned over a five day period (disease incident) after eating 'wild tomato' (*Solanum quadriculatum*) and 'native tomato' (*Solanum ellipticum* var. foothills) (Figure 1).

This disease incident was presented in a case report to the 2007 Townsville Conference of the Australian Cattle Veterinariansⁱ.

Cattle in paddock ... before and during incident

Of the 95 breeder cows and heifers in the paddock, 83 were mainly mature Droughtmaster cows, imported from the semi-arid tropics of Katherine in 2004. The remainder were locally-born three year old Droughtmaster cross heifers. In the three weeks leading up to the disease incident, paddock feed had been abundant, dry, but low quality and there had been a couple of small rainfall events totalling less than 10mm. During the five day disease incident, 23 sick or dead cows were recorded. Sick cows appeared aggressive, depressed or moribund. The age mortality percentage ranged from 43% in eight year old introduced cows to no mortality in three year old introduced or local-bred heifers. The comparatively high percentage of deaths in the six to nine years old cows suggests that absence of grazing experience in weaners on arid rangelands had increased their risk of plant poisoning.

Necropsy and histopathology

Necropsies were undertaken on five cows; remarkable findings included:

- dry rumen contents with a large green feed component (five cows)
- pin-point, bright reddening or bleeding of the rumino-reticular wall (four cows)
- bright or intense, dark reddening of the proximal (fundic) abomasal mucosa (four cows) (Figure 2)
- pulmonary interstitial emphysema with epicardial haemorrhages (four cows)
- constricted (empty) urinary bladders (two cows).

Histopathology indicated:

- non-specific tissue changes (consistent with anorexia, dehydration, agonal change and 'shock reaction' in the necropsied cows)
- specific tissue changes that supported the necropsy findings (epicardial haemorrhage; pulmonary emphysema; broncho-pneumonia)
- specific tissues changes that augmented necropsy findings (haemorrhage in the abomasal wall (Figure 3); necrosis and inflammation in the rumen wall (Figure 4).

Histopathology of the rumen wall has not been previously reported for *Solanum quadriculatum* or *Solanum ellipticum* poisoning of ruminants.

Botanical expertise

A botanist at the NT Herbarium identified pieces of ingested plants from dried rumen contents of four necropsied cows, and plant specimens from two paddock surveys. Out of the seven potentially poisonous plants that were identified, six had been grazed; including *Solanum* spp. plants.

Historical feeding trial

The differential diagnoses focused on the forestomach and abomasal lesions, plus a previous report about cattle deaths in the area. After ruling out infections, parasite infestations, chemical poisonings (urea, arsenic) and other poisonous plants, *Solanum* spp. poisoning was ruled in, based on conditions of plant poisoning in pastoral areas and pathophysiology of a *Solanum* spp. poisoningⁱⁱ. There was also supporting evidence from a historical feeding trial with sheep that were fed *Solanum quadriculatum* in which the reported gross pathologyⁱⁱⁱ was notably similar to the disease incident.

Jocelyn Coventry,
Pastoral Production Officer
8951 8142

Ian Jerrett,
Pathologist,
8999 2240



Figure 1 *Solanum quadriloculatum* (left) and *Solanum ellipticum* var. *foothills* (right)

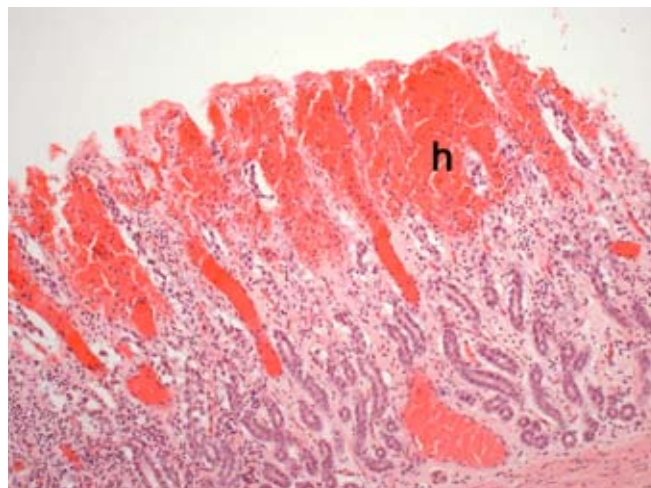


Figure 3 Histopathology of abomasal wall (H&E stain)—haemorrhage (h – haemorrhage into the lamina propria of the superficial to mid-level mucosa)



Figure 2 Gross pathology of abomasum—intense, dark reddening in the fundus

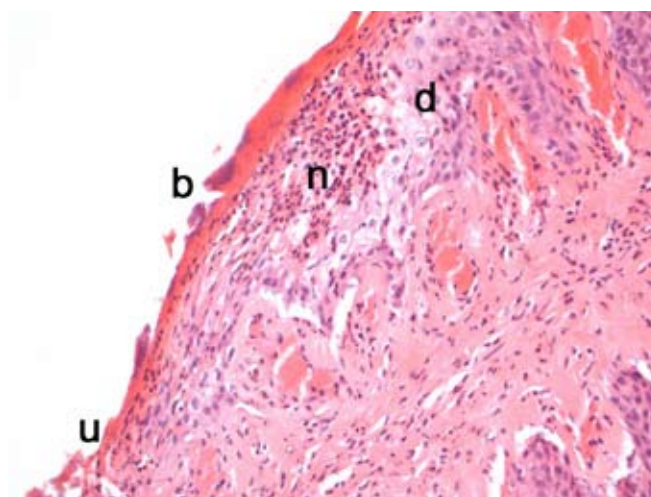


Figure 4 Histopathology of rumen wall (H&E stain)—necrosis (d – vacuolar degeneration and necrosis of rumen epithelium; n – neutrophil infiltration of areas of necrotic epithelium; b – bacterial colonisation of superficial keratin layers; u – progression from erosion to ulceration)

- i Coventry J and Jerrett I (2007) Suspected *Solanum quadriloculatum* and *Solanum ellipticum* poisoning in extensively-grazed beef cattle in Proceedings of the Australian Cattle Veterinarians 2007, Melbourne & Townsville Conferences, Australian Cattle Veterinarians: pp36-45
- ii Clarke EGC and Clarke ML (1975) Veterinary Toxicology reprinted 1st ed Bailliere Tindall: London
- iii Chippendale GM and Murray LR (1963) Poison Plants of the Northern Territory Commonwealth of Australia, Northern Territory Administration, Animal Industry Branch

Spot the risks!

Protect your stock from the risk of emergency animal diseases.

SPOT THE RISKS!
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Feed & water:
only purchase clean, fresh products from quality assured suppliers, store to prevent contamination.

Feral animals & pests:
work with your neighbours to control feral animals and pests.

New stock:
insist on an NVD and health declaration, isolate and monitor new stock for a week.

SPOT THE RISKS!
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Vehicles & visitors:
maintain a controlled entrance, record personnel movements, ensure visitors' boots and hands are clean.



SPOT THE RISKS!
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SPOT THE RISKS!

Good livestock farming practices make good sense.

If you spot unusual disease symptoms, abnormal behaviour or unexpected deaths in your herd, immediately call your veterinarian, stock inspector, or the Emergency Disease Watch Hotline on **1800 675 888**.

Look. Check. Ask a Vet.



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