Suspect Swainsona poisoning in horses

About nine horses died over a two week period during August 2006 on a southern Barkly Tableland property. Deaths were attributed to Birdsville disease after symptoms suggested intake of the plant *Indigofera linnaei*. A month later new cases emerged with similar symptoms suggesting neurological involvement.

At the time of investigation, several horses had died since the start of the second outbreak, but the presentation of clinical disease appeared to be milder and more chronic than during the first outbreak. Two horses had the condition for at least four weeks. The newest case developed signs less than ten days earlier.

Seven affected horses were presented and showed various signs of ataxia, incoordination and predominantly, a stiff gait in the hind limbs. In some horses the toes of the hind hoofs were worn down, but hoof dragging was not observed during yard handling. Mild bilateral swelling above the rear fetlocks was present in three horses. Animals showed severe weight loss, were lethargic/depressed and weak. One horse was rocking and some others showed muscle trembling after being moved around. Mild dehydration was present despite access to water all the time. Horses were still eating, but probably had a reduced appetite.

Undisturbed, affected horses would move in semi-circles when grazing or going to the water trough. When approached, the animals appeared frightened and moved away with a high stepping front gait, but would soon settle to their depressed state.

One eight-year-old gelding that had the condition for four weeks was euthanised and a necropsy performed. There were no gross lesions visible in the internal organs. The stomach was filled with grass stalks and the intestine contained ingesta and faeces of normal appearance. Brain, spinal cord and organ samples were collected for histopathological examination.

The serum chemistry profile and the red and white blood cell parameters did not reveal any significant changes. There was no indication of organ damage as indicated by normal serum enzyme levels. There were no abnormalities detected on microscopic examination of organ sections from the heart, kidney, spleen and gastro-intestinal tract. The lungs and liver did not have significant changes that could contribute to the observed condition.

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Stop Press!

Bovine tuberculosis (TB) eradication program is now completed.

*Full details on page 6*
Lesions found in the brain were described as degenerative and chronic in nature. The observed changes (axonal spheroids) in the brain cells and sections of the spinal cord are more suggestive of a toxin affecting the nervous tissue of the body. There was no evidence of inflammatory changes that one would expect to see from the involvement of infectious agents.

Serum samples of the seven affected horses as well as three unaffected horses were screened for antibodies to known viruses of relevance to the neurological syndrome. All horses tested negative for antibodies to Elsey virus. There were antibodies present to Kunjin virus, Murray Valley Encephalitis (MVE) virus and an unidentified horse virus in the majority of samples, but without any pattern that could link positive serum findings with the horses showing clinical signs. Kunjin and MVE cause encephalitis in humans and are transmitted by mosquitoes. Antibodies to these two agents, as well as to the unidentified virus V6653, which is serologically indistinguishable from V2513, are commonly found in horses in the Northern Territory. Kunjin and V2513 have been implicated occasionally in mild disease cases in individual animals in the past. MVE is not known to cause illness in horses. No viruses were grown on two different cell lines after four weeks of incubation.

The brain lesions observed, are usually associated with plant poisonings. The Swainsona family of plants are the most likely to be involved according to text descriptions of recorded cases. Cycads can give similar lesions, but these plants are not known to occur in that area. Birdsville disease can give a similar clinical presentation to that described in the early stage of the outbreak, but the classical splay leg stance and prominent dragging of the hind feet were not present in advanced cases. Also, the specific microscopic lesion of axonal spheroid formation has not been described with Birdsville disease. However, it is possible that the horses have consumed both plants and that we are observing a combined effect of both toxins. It is also possible that the first outbreak may have been more attributed to the intake of Indigofera and the second outbreak more related to Swainsona intake.

There would be value in demonstrating the presence of the implicated plants in the paddocks where affected horses were resident prior to the outbreak, and then to look at its wider distribution. A shower of winter rain during July may have been the trigger for producing the plant growth that led to the outbreaks in August and October/November. Swainsona canescens, known as Grey swainsona, is the species found in the NT and is one of five species of the Swainsona family implicated in the poisoning of horses and other livestock in Australia. Others are known as the Darling peas.

Francois Human
Veterinary Officer
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**Case Report: An interesting nasal tumour**

Rocket is a three year old, intact male, 58kg, mastiff cross breed dog who presented with a history of bleeding from one nostril for the previous week. The bleeding was first noticed when he was seen to run into a parked car quite hard while playing in the yard, so the owner assumed the cause was trauma and didn’t worry for a few days. On examination the bleeding was a continual drip from the left nostril only. There was occasional sneezing but the dog otherwise seemed completely normal. There was no other gross evidence of a bleeding disorder and no blood in the urine on a dipstick, so I sent him home with a week of antibiotics and strict rest in the hope it would resolve, but was not surprised when it didn’t.

Nine days later we admitted him for further work-up. Standard haematological parameters (obtained in-house) and buccal mucosal bleeding time were normal. Radiographs of the nose showed diffuse increased opacity in the left side and loss of turbinate detail. There was no distortion of the nasal cavity and the midline was intact. There was no apparent connection with the teeth, although he had a fractured canine on that side. So, we did a nasal flush – just flushing and aspirating three times with 10mL saline each time through some soft sterile tubing – some was kept for fungal and bacterial culture at Berrimah Veterinary Laboratories (BVL) and there were some clots and small chunky bits that were used to make smears. We looked at three smears and sent some to BVL also. All the smears showed mainly blood but all also had small clumps and sheets of round cells with morphology typical of transmissible venereal tumour (TVT). BVL confirmed a round cell tumour, very probably TVT.

When we get the chance to treat, we’ve found vincristine to be really effective and not exhorbitantly expensive. We use a dose of 0.5mg/m2 by strict i/v injection once a week for four to six weeks. With tumours on the prepuce and penis you can see a rapid reduction in tumour size even after the first week. We gave Rocket four treatments. Bleeding from the nostril was still evident but much reduced after the first week and had stopped by the second week. The last injection was given on 29/12/06 and so far there has been no recurrence of bleeding.

Helen Parkes  
Gove Vet Clinic, Nhulunbuy

**Editorial note:-**

Histological and Cytological opinion relies on the knowledge, experience and skill of the diagnosticians performing the specimen preparation, processing, staining, microscopic examination and interpretation. Generally the preparatory work is performed by the technical staff, while the diagnostic microscopy is the domain of the pathologist. As in the case report above, the greater the information supplied by the submitter, pertaining to the animal, such as case history, previous blood test or X Ray results, previous treatments etc, the more targeted and relevant the diagnosis.
Chris Cowled

A PhD student from Geelong visits Berrimah Veterinary Laboratories.

The Australian Biosecurity Cooperative Research Centre for Emerging Infectious Diseases (AB-CRC) opened in 2003. Its aim is to protect Australia’s public health, livestock, wildlife and economic resources from emerging infectious diseases.

Chris Cowled, an AB-CRC PhD student, who is based at the Australian Animal Health Laboratory, Geelong, worked at Berrimah Veterinary Laboratories (BVL) for the four weeks prior to Christmas 2006. Chris’ visit was to facilitate his access to unidentified viruses and sera containing antibodies to unidentified antigens which have been collected as part of the National Arbovirus Monitoring Program (NAMP) in northern Australia.

Work conducted under the NAMP program has isolated hundreds of viruses in recent years. Identification of 30% of these viruses has not been possible using conventional serological techniques. The majority of these viruses are novel (new to science) and classical techniques for the characterisation and subsequent identification of novel isolates is very time consuming.

There is also a critical need to increase the speed with which virus isolates from monitoring programs are identified, so that their potential threat to livestock and human health can be assessed.

Chris’ PhD project aims to apply sophisticated molecular technologies to the characterisation of novel viruses circulating in livestock and wildlife in northern Australia. A number of viruses have already been identified and characterised by partial and full-genome sequencing. This will assist in more accurate threat assessment of these viruses in respect to livestock production and trade, as well as identifying and characterising new viruses. The project will also help assess the validity of these techniques for adaptation to virus monitoring and detection programs.

Chris was happy with the progress he made during his visit, as he successfully characterised 144 isolates cultured from cattle over the past two years. Chris also identified a number of viruses isolated from mosquitoes, and began serological testing to help identify the natural host range of both viruses.

The engagement of the BVL as one of the leaders in the AB-CRC project will ensure that outcomes from the project are rapidly applied to surveillance of arbovirus activity in northern Australia.

Need information quickly?

A Useful Website which may help!

Veterinary laboratory manual

The Veterinary laboratory manual (‘Vet lab manual’) is aimed at providing accessible, up-to-date information to laboratory clients to assist in the submission of diagnostic specimens that will be useful. There is also information for specimens collected for accreditation and export purposes.

The manual includes information about specimen collection and submission in general, as well as for specific diseases and diagnostic disciplines.

The manual can be found at: www.dpi.nsw.gov.au/agriculture/vetmanual
Animal Welfare is everybody’s business

Animal welfare has become a hot topic over the last few years and it will become an increasingly significant area of activity for government, industry and the community in general. Australia, a country at the forefront of animal welfare, is currently undergoing a series of reviews in national management and policy processes after the launch in 2005 of the Australian Animal Welfare Strategy (AAWS). The AAWS is an agreed blueprint for animal welfare in Australia that aims to enhance welfare outcomes for all animals.

As part of this process, a review of the two peak bodies that provide high-level advice to the Commonwealth Minister for Primary Industries on all animal welfare issues commenced late last year. These are the National Consultative Committee on Animal Welfare (NCCAW) and the Animal Welfare Working Group (AWWG).

It is also proposed that the existing Model Codes of Practice for the Welfare of Animals be re-written in a new format to incorporate both the national welfare standards and industry best practice guidelines for each animal species or enterprise. Animal Health Australia has developed a business plan to rewrite the codes and the initial task is to reformat each of the 22 existing model codes into a document that combines Australian Welfare Standards and Guidelines using a standard template.

In the Northern Territory, the Department of Local Government, Housing and Sport is the agency in charge of administering the Animal Welfare Act and as such, will be in charge of the AAWS implementation. The Department of Primary Industries, Fisheries and Mines (DPIFM) will be in charge of investigating animal welfare incidents in livestock and production animals, including animals in aquaculture. DPIFM is currently drafting a memorandum of understanding to establish roles and responsibilities as well as reporting processes between the departments.

Watch this column for further developments in animal welfare.

Mauricio Perez-Ruiz
Senior Veterinary Officer
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Out and about

Peter Saville, regional veterinary officer in Alice Springs, attended an Exotic Animal Diseases training course at the Australian Animal Health Laboratories during November 2006. The new changed course is severely constrained due to animal welfare/animal ethics concerns which limited the use of live animals.

Greg Crawford, regional animal health officer in Alice Springs and Peter Saville assisted with the Idracowra field day.

Thomas Haines, stock inspector from Tennant Creek, attended a Tick Fever training course at Wacol near Brisbane.

Sharon Kearney has commenced duties as Stock Inspector: NLIS in Darwin. Sharon will be concentrating on the national livestock information system (NLIS) training and assistance to producers in the Darwin and Katherine regions as well as performing regular stock inspector duties.


Mauricio Perez-Ruiz and Sharon Kearney attended the Animal Welfare Training organised by the Department of Local Government, Housing and Sport at the Mirambeena Resort in Darwin during December 2006.

Richard Weir and Lorna Melville represented the Virology Laboratory at the National Emergency Animal Disease (EAD) Laboratory Exercise Workshop, held in Adelaide in December. This workshop was held to discuss arrangements for the large scale avian influenza simulated EAD activity scheduled for mid 2007.

John Humphrey, Manager, Aquatic Animal Health, attended a Workshop on Translocation and Hatchery Accreditation held on Bribie Island in December. This workshop was concerned with disease control relating to the movement of aquaculture species between jurisdictions.
CVO report

The bovine tuberculosis (TB) eradication program is now completed.

It started as the brucellosis and tuberculosis eradication campaign (BTEC) and surveillance continued through the tuberculosis freedom assurance program (TFAP). All field surveillance TB testing was completed during 2006. Future surveillance will be at abattoirs only. The last TB case in cattle in Australia was in 2001 and in 1999 in the Northern Territory (NT). The last TB case in buffalo was in 2002. The TB program started with dairy cows from the 1920s to 1950s with beef cattle involved from the 1960s. Over one billion dollars were spent with about $210 million spent in the NT. It was necessary to change cattle management systems in the extensive areas in central and northern Australia to achieve TB eradication. Owners, managers, private vets, government vets and laboratory staff, stock inspectors and chopper pilots involved are commended for a magnificent outcome. Australia is the only country with extensive cattle management practices that have managed to eradicate bovine TB.

A new pathogenic and infectious clinical syndrome due to a new unidentified strain of Chlamydia was detected in hatchling farmed crocodiles in mid 2006. There was severe mortality with severe throat and eye lesions. The department has been working with crocodile farmers to diagnose and manage the new endemic disease. Future disease control will rely on good biosecurity measures with minimal use of antibiotics. An Australian pesticides and veterinary medicines authority permit will be sought as there are no antibiotics registered for use in farmed crocodiles.

Veterinary practitioners are encouraged to be aware of potential exotic diseases and to be aware of potential zoonotic diseases when investigating disease in animals. Australian Bat Lyssavirus has been identified in the NT. While Hendra virus has not been demonstrated in the NT, Hendra virus is a zoonotic risk in any horse with acute respiratory disease. The Queensland Department of Primary Industries and Fisheries have revised guidelines for handling possible and probable Hendra virus cases in horses available on the internet at www2.dpi.qld.gov.au/health/16503.html

I wish you all a happy and prosperous 2007.

Brian Radunz
Chief Veterinary Officer
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Exotic Animal Disease Newsletter

Volume 1, Issue 1 January 2007

A new exotic animal disease newsletter has been published by the Commonwealth Department of Agriculture, Fisheries and Forestry (DAFF). A copy thereof is distributed with this newsletter for your interest. DAFF would welcome any feedback. Unfortunately, it is not available on the web yet, however a wealth of information may be found at www.daff.gov.au

Please note that several serotypes of the bluetongue virus are present in northern Australia, but are not causing any clinical disease. The distribution and seasonal variation of the virus and its vectors, the Culicoides midges, are monitored through strategically placed sentinel cattle herds. Regular blood collections are complimented by insect traps in the same area.
Regional round-up

Poor reproductive performance in heifers is a widespread concern in most regions of the Northern Territory. On one property, blood samples from three-year old empty heifers were collected to test for reproductive diseases. The heifers had received one round of vibrio vaccine while the bulls were fully vaccinated. Approximately 50% of the heifers had antibodies to Pestivirus, 85% had antibodies to Akabane virus and only 11% had antibodies to Leptospira var hardjo. These diseases are only of reproductive concern if the animal is exposed to the pathogen during certain stages of pregnancy. Comparative samples from pregnant animals in the same group can be helpful to determine the significance of antibody findings in empty animals. Immaturity and low weights at time of mating are thought to be the limiting factors in this herd, rather than reproductive disease.

Fifteen heifer deaths were reported in the Katherine region within one week of transport from Halls Creek. Two day-old carcasses were examined. There was no evidence of struggle prior to sudden death. Heavy growth of belly-ache bush (*Jatropha gossypifolia*) in the paddock was observed. *Jatrophas* contain a toxic lectin called curcin in all parts of the plant, particularly the seeds. It affects mainly the gastro-intestinal tract with associated signs of gastro-enteritis and death in severe cases.

Two Brahman bulls died suddenly on a Katherine property after 40 bulls were transported from Moura and Cloncurry prior to the incident. The bulls had been accustomed to grazing leuceana, and moved directly towards ironwood suckers and trees when unloaded. A post-mortem examination revealed evidence of haemorrhage around the valves of the heart and rumen and abundant ironwood leaves in the rumen. There were scant contents in the small and large intestine.

Approximately 100 red-winged parrots were reported to have died over a two week period in Daly Waters town area. Further deaths were reported at Kalala station. Parrots were lethargic, inappetant and dehydrated prior to death. Laboratory results indicated that lesions present in the ventriculus may have been an indicator of environmental stress or an unidentified toxicity. There was no evidence of infection and avian influenza was excluded.

A goat with chronic ill-thrift was found to have a high faecal egg count and Haemonchus larvae were grown on culture. The animal was treated with ivomec, but a faecal egg count two weeks later revealed almost no reduction in the egg count. Anthelmintic resistance has been encountered before on this property. The owner was advised to use different anthelmintics and alternate regularly between them.

Cattle deaths on different properties around Alice Springs were suspected to be from plant poisoning. At Old Man Plains research station losses coincided with cattle graveyard during the ketosis outbreak.
Continued from page 7

with a sudden temperature change. Calf losses on another property were suspected to be from coli-septicaemia.

A mob of older cows on a Barkly Tablelands property were moved from the lakes country and subsequently downers and deaths were seen a week later. The majority of animals were in advanced stages of gestation or had just calved. A pale liver was a consistent finding on necropsy, but no other gross lesions were observed. The urine had a very high ketone content as shown on a urine dip-stick. One of the animals examined showed signs of secondary photosensitisation on the muzzle. A diagnosis of ketosis, also known as pregnancy toxaemia was made. This metabolic disturbance most likely occurred due to the stress associated with the handling of these animals in advanced pregnancy, although the high protein diet from legumes and shrubs in the lakes area could also have been a contributing factor.

Antimicrobial resistance – An emerging problem?

Monitoring trends in antimicrobial susceptibility of bacterial isolates from animals including both terrestrial and aquatic species is becoming increasingly important in public and animal health.

There are many unanswered questions about the magnitude of the antimicrobial resistance problem and the factors most likely to affect development of resistance in bacteria. A multidisciplinary approach such as phenotypic standardised antimicrobial susceptibility testing methods and molecular techniques are essential to understand the complex evolution of resistance.

At the bacteriology section of Berrimah Veterinary Laboratories, the following antimicrobial resistance against specific bacteria were recorded in the past two to three years using Clinical and Laboratory Standards Institute method:

- *Vibrio harveyi* from farmed barramundi resistant to trimethoprim
- *Vibrio harveyi* from farmed prawns resistant to erythromycin
- *Salmonella sp.* and *Providencia rettgeri* from farmed saltwater crocodiles resistant to tetracycline, sulphafurazole and trimethoprim/sulphamethoxazole
- *Pseudomonas aeruginosa* from dogs’ ears resistance to a range of antibiotics

In all the above cases, the animals were treated with respective antibiotics prior to bacteriological investigation. It is illegal to use antibiotics, other than on prescription from a veterinarian, and the prudent use of antimicrobials by veterinarians is essential to control this emerging problem in animals.

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