

ANIMAL HEALTH SURVEILLANCE

Information contributed by staff of the Livestock Health and Pest Authorities and the Department of Primary Industries

Highly pathogenic avian influenza detected in poultry

The manager of a four-shed, free-range egg farm near Maitland reported sudden death in about 1% of 12,500 forty-week-old birds in one shed on 9 November 2012. The attending vet suspected fowl cholera, prescribed antibiotics and submitted samples to the Virology Laboratory at Elizabeth Macarthur Agriculture Institute (EMAI), Menangle, for avian influenza exclusion. Over the weekend the death rate rapidly increased to 10%, and deaths began to occur in a second shed. By the following Monday a substantial drop in egg production had occurred in a third shed.

Samples tested positive for influenza A at EMAI and were subtyped as H7N7. The virus was subsequently confirmed by the Australian Animal Health Laboratory to be highly pathogenic H7N7 avian influenza.

In Australia, all outbreaks of avian influenza caused by subtypes H5 or H7 are stamped out. Poultry on the infected property were destroyed by using foaming equipment from the Victorian Department of Primary Industries. Dead birds were moved to separate sheds for composting. All eggs waiting to be collected were composted.

A restricted area (RA) was set up for 1 km around the infected premises (called '1 IP'). No commercial poultry



Poultry in the sheds where H7N7 avian influenza occurred were humanely euthanased by using a foaming machine. Photo by K Cooper

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enterprises were located within the RA, but backyard chickens were identified on 6 properties and 1 property had pet birds; these properties were classed as 'at-risk premises'. As well, a control area (CA) was set up with a radius of 10 km around 1 IP. Fourteen properties with various poultry enterprises (called 'premises of relevance') were identified in the CA.

By the end of December, at-risk premises and premises of relevance were tested up to 5 times, all with negative results. Ongoing monitoring of the health of the birds showed no evidence of spread of the disease from 1 IP. Avian influenza was ruled out as a cause of poultry illness on a number of properties outside the RA and CA during that time.

All movements of potentially risk-carrying vehicles and product to and from 1 IP over the 21 days before the disease was detected were traced and the disease status of the traced premises determined. All traces were considered low risk. In all, poultry on 9 trace premises were assessed as healthy and returned negative avian influenza test results. An egg-processing plant that had received eggs from 1 IP was disinfected and the at-risk eggs destroyed.

The source of the infection is suspected to have been wild ducks that used a dam about 200 metres from the sheds. Ducks were also observed to feed on grain from a leaking silo just outside the chicken free-range area. Testing of duck faeces was negative for avian influenza virus,

although this result was not necessarily significant from an epidemiological viewpoint. Measures were taken to prevent the silo from leaking. The premises were decontaminated, and the movement restrictions and declared area status were removed about 5 weeks after the outbreak had been detected.

**For further information contact
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(02) 6391 3687.**

Diarrhoea in beef calves leads to contact with our surveillance system

In spring and early summer 2012 there were widespread reports of diarrhoea and deaths of beef calves on the Central Tablelands of NSW.

Owners reported more serious problems than usual on 9 farms between early September and late December 2012. On each property the sickness rate ranged from 2% to 70%, but was usually 10% or less. The death rate was relatively low, ranging from 1% to 10% and averaging 3%.

Affected calves were aged 1 week to 3 months; most were between 2 and 4 weeks old. Some calves were observed to be weak with yellow faecal staining on the tail and breech, but others were simply found dead. A diagnosis of neonatal diarrhoea was made if the calf presented with evidence of marked dehydration, including sunken eyes, evidence of diarrhoea on the breech and the absence of alternative findings



Calf showing evidence of yellow diarrhoea; it later died. Photo by B Watt



Sunken eyes indicate marked dehydration. Photo by B Watt

during post-mortem examination. In some cases, calves were presented dead for necropsy but inspection of the mob on the property revealed other calves with diarrhoea.

In 6 of the 9 cases, rotavirus was detected in faecal samples. No infectious agents were found in three cases. One case was positive for both rotavirus and *Cryptosporidium* sp.

The high prevalence of rotavirus alone was treated with caution, as low levels of rotavirus can be identified in normal calves. However, rotavirus infection can cause high rates of disease in young calves, and these rates can increase when warm weather exacerbates dehydration or when the infection is combined with bacterial or protozoal infection. Cryptosporidia are routinely isolated from calves in this region, but in this outbreak they were detected at lower rates than expected.

A larger survey is being considered by the Central Tablelands LHPA to help determine the patterns of disease in these cases. The problem seemed to be more common in calves of heifers and in calves born later in the season, but no direct link with adverse environments, poor host immunity or challenge from infectious agents was identified.

The owners were advised to treat sick calves with oral fluids. Although rotavirus and *Cryptosporidium* do not respond to antibiotics, their use has been

recommended in very sick calves, as they are at risk of secondary bacteraemia (bacterial infection of the bloodstream). The owners were also advised to take personal hygiene precautions, because *Cryptosporidium*, *Salmonella* and *Escherichia coli* can all be transmitted from animals to humans.

Official veterinary participation in this kind of surveillance is important, because it helps owners establish relationships with veterinary authorities to facilitate early reporting of more serious diseases. It also promotes collaboration with private veterinarians to ensure sudden death is effectively investigated when, in the face of the owner's financial considerations, it might otherwise have gone unreported. In this case, a newspaper article on the subject was used to increase the level of awareness of biosecurity in regard to scouring and to remind readers of the importance of appropriate antibiotic use.

For further information contact Bruce Watt, Senior District Veterinarian, Tablelands Livestock Health and Pest Authority, Bathurst, on (02) 6331 1377.

Anthrax emerges again with summer heat

There were three anthrax incidents during the October to December quarter. In November, 70 ewes were reported to have died on a property in the Forbes district. The district veterinarian obtained

a positive ICT (immunochromatographic test), and follow-up PCR (polymerase chain reaction) at the laboratory was positive.

In December there were two unrelated anthrax incidents. A property in the Central West near Molong reported the death of three head of cattle out of a herd of 400, and a property near Condobolin reported the death of a single animal in a herd of 160 cattle. Both these properties had a history of anthrax and had not vaccinated in recent years.

All of these properties are in the known anthrax endemic area of NSW. The incidents were managed according to NSW DPI anthrax policy, with properties being placed in quarantine, all at-risk stock vaccinated and carcasses disposed of by burning. No off-property movements of at-risk stock had occurred.

Twenty-six investigations of deaths excluded anthrax during the quarter. Nineteen involved cattle, 5 involved sheep, and 1 each involved a horse and an eland at a zoo.

For further information contact Barbara Moloney, Technical Specialist Epidemiology, NSW DPI Orange, on (02) 6391 3687.

An unusual presentation of scabby mouth in young rams

Seven of about 100 eight-month-old homebred Border Leicester stud rams were affected by an unusual presentation of contagious ecthyma (scabby mouth, caused by the orf virus) on a property near Narrabri, NSW.

The rams did not have typical lesions affecting the mucocutaneous junctions (the areas where the mucous membranes and the skin join) of the mouth and nose. Instead, they presented with hyperkeratotic (thickened), proliferative papillary projections on the ears and top of the head. The projections were up to 15 mm long and 5 mm in diameter. The skin surface bled profusely when the projections were plucked. One ram had



Scabby mouth lesions on the poll and ears. Photo by L Guest.

a more typical contagious ecthyma lesion on its leg.

Lesions were taken from the head and ear lesions on two rams and submitted to the NSW State Veterinary Laboratory at Menangle. Gram-stain examination for the bacterium *Dermatophilus* was negative on both samples. Electron microscopic examination of samples from both rams was positive for orf virus.

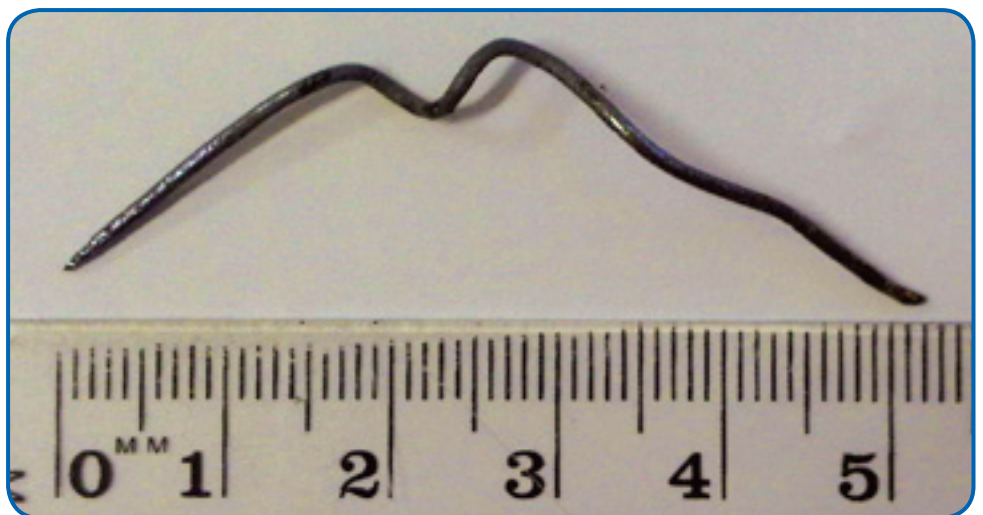
There was no history of injury or ill-health in the rams or of grazing abrasive pastures (e.g. thistles). The owner reported that they had seen typical contagious ecthyma lesions in sheep on the property in the past, although the diagnosis had never been confirmed.

For further information contact Libby Guest, District Veterinarian, North West Livestock Health and Pest Authority, Narrabri, on (02) 6792 2533.

Tick fever exclusion in north-western NSW

Tick fever of cattle is a notifiable disease in NSW. It was recently excluded as the cause of central nervous system signs and red urine in a mature cow euthanased by a landholder near Carinda, in north-western NSW.

The cow had been pacing a fence line and appeared to be blind. She was standing with her neck extended and had difficulty breathing. She also had some swelling under the lower jaw. The producer also reported that she had 'red-coloured urine'. All other cows in the paddock appeared normal. Other possible diagnoses based on the clinical signs described included tick fever, theileriosis (a disease caused by the tick-borne blood parasite *Theileria*), traumatic reticulopericarditis (inflammation of the reticulum and



'Hardware disease' caused by penetration of the stomach and other organs by items such as wire can cause signs similar to those of notifiable diseases. Photo by L Guest.

the heart sac from penetrating injury caused by eating a foreign body – also called ‘hardware disease’) and bovine spongiform encephalopathy (mad cow disease).

A necropsy revealed severe swelling of the corneas of both eyes and scarring consistent with chronic pink eye. The urine was extremely dark, presumably because of dehydration, but it did not contain blood pigments. The brain had been obliterated by gunshot and could not be tested for mad cow disease. The internal fat was yellow, although it was difficult to determine if this was from jaundice. The liver was normal. The reticulum was stuck to the diaphragm by fibrous tissue from an old, healed abscess. The diaphragm was perforated by a 5-cm piece of tie wire, which extended forwards from the reticulum into the chest cavity. The pericardium (heart sac) was thickened and contained air bubbles. A diagnosis of traumatic reticulopericarditis was made.

This case is interesting in that the clinical signs described by the owner were consistent with the regionally important differential diagnoses of tick fever, theileriosis and bovine spongiform encephalopathy. However, a timely surveillance investigation by a district veterinarian excluded these other possible diagnoses by confirming an alternative diagnosis at autopsy.

For further information contact Libby Guest, District Veterinarian, North West Livestock Health and Pest Authority, Narrabri, on (02) 6792 2533.

Tetanus in goats

The following example shows that when producers don't place much financial value on their livestock deaths can occur without a definitive diagnosis being made. In this case, the official veterinary service filled the gap that would otherwise have occurred in disease surveillance.

A beef cattle producer near Ballina, NSW, reported deaths in a small herd of



Extreme rigidity from tetanus in a young goat that is unable to stand. Photo by M Ball

unvaccinated Boer goats on the property. The goats were used for household meat consumption and were grazing on 43 hectares of low-lying unimproved pasture and weeds near the banks of the Richmond River.

The herd was established in 2007 with approximately 50 does and 3 bucks, but by October 2012 herd numbers had steadily declined to about 30 because of ongoing undiagnosed deaths. Deaths were also occurring in young kids.

In September 2012 at least 8 goats, including a number of kids, had been found dead. There had been no obvious signs of disease before they had died. Some weeks later, 2 live goat kids aged about 8 weeks were found lying on their sides, unable to stand.

The farmer suspected that a neighbour was poisoning the goats, and the district veterinarian investigated the problem.

The 2 live kids were both lying on their sides with a ‘sawhorse’ posture and a dorsal curve (i.e. toward the back) in the spine.

The tails were deviated to one side. It was not possible to open the mouth of either kid, and saliva was drooling from the mouths. One of the kids had a prolapsed third eyelid. The kids could not be made to stand and did not respond to stimuli.

When carried, the kids were as ‘stiff as a board’, with no flexing or extension of any muscle groups.

Following euthanasia, no gross abnormalities were identified at necropsy. Tetanus was diagnosed on clinical grounds. The owner was educated about the importance of vaccination and veterinary investigation of multiple deaths and the obligation to manage the welfare of animals, irrespective of their financial value.

For further information contact Matt Ball, Senior District Veterinarian, North Coast Livestock Health and Pest Authority, Lismore, on (02) 6621 2317.

First report of ichthyosis fetalis in cattle in the Central West of NSW

In mid-October 2012, a landholder west of Nyngan in NSW contacted the district veterinarian because 40% of his cows (4 out of 10) had given birth to dead calves, or calves that died shortly after birth, with scales all over their bodies.

The calves had hard white plaques over the entire body, in patterns formed along the wrinkle lines of the skin, making the lesions appear like scales. There was very little hair on the animals. They had small ears, and their lips and eyelids were turned outwards.



Ichthyosis fetalis. Photo by J Kelly

The parents of these calves looked normal. However, the history provided by the landholder suggested that the herd was quite inbred; the parents of these calves were half brothers and sisters.

Skin from a dead calf was submitted to the State Diagnostic Veterinary Laboratory at EMAI, Menangle. Histopathological examination of the tissue revealed severe epidermal and follicular orthokeratotic hyperkeratosis (thickening of the corneal layer of the skin) consistent with a genetic disorder called ichthyosis fetalis.

Samples from the affected calf and the parents are currently being tested at the University of Milan, Italy, for the genetic mutation that is known to be responsible for ichthyosis in other breeds of cattle.

This is the first time ichthyosis fetalis has been diagnosed in Australia.

For further information contact Jillian Kelly, District Veterinarian, Central West Livestock Health and Pest Authority, Nyngan, on (02) 6832 1008.

Bovine Johne's disease tracing

A critical component of the NSW Government's animal disease surveillance system is the tracing of animals to and from a disease outbreak or incident. Investigation of the status of traced properties can be complex, as these cases show.

The detection of bovine Johne's disease (BJD) on a Brahman stud at Rockhampton, Queensland, was widely reported in the rural media.

The Queensland Chief Veterinary Officer advised Biosecurity NSW that 10 cattle were moved to 7 properties in NSW from the Queensland stud over the past 7 years. LHPA district veterinarians and NSW DPI veterinary officers have traced these 10 cattle (mainly bulls) and have started to assess whether there has been any spread of the infection.

Six cattle that went to 5 properties are available for testing. These cattle will be tested and removed from the properties. Most owners have chosen to have the cattle tested by faecal culture. This involves collecting faeces twice, with a 3- to 6-month interval. If the cattle test negative, there is a low probability that they will have spread infection to the properties. This will result in properties regaining their non-assessed status.

Status resolution on the remaining 2 properties is complicated by the fact that some of the animals sent to these properties are not available for testing. One property received a 2-year-old bull in October 2008, but it died in March 2008 of unknown causes (although it did not have scouring or wasting). The bull's 2008-drop calves (now 4-year-old cows)

will be tested. If they are negative, the property will revert to non-assessed status.

The remaining property purchased 3 bulls (in 2007, 2009 and 2011); the bull bought in 2009 died some time ago, but it did not have signs that suggested it had BJD. The property is mainly a cropping enterprise with a herd of 50 breeders. A plan to resolve the property's status is being developed.

In terms of tracing, this is a small exercise. For example, in 2012 Victorian authorities detected BJD on a Brangus stud. They notified NSW DPI that, according to National Livestock Identification System (NLIS) records, 75 cattle had been moved to 35 properties. Testing on cattle available for testing is almost complete, with no BJD detected in the traced animals to date. An additional 5 animals were identified from a sale made in 2005 (details were not recorded on the NLIS). Testing is under way on these additional animals.

For further information contact Graham Bailey, Technical Specialist, NSW DPI Orange, on (02) 6391 3455.

Bovine Johne's disease in a Market Assurance Program herd

Disease surveillance systems also monitor the success of national or state disease control programs. The following case study is typical of cases where bovine Johne's disease (BJD) is diagnosed in a herd that has been in the BJD Market Assurance Program (MAP) for many years, but that nonetheless has a very low level of infection with BJD.

The herd was formed over a century ago with very few introductions, the last of which occurred 15 years ago. In mid-2012, when a problem was identified, the herd had 225 cattle over 24 months of age; approximately 150 cows were being milked. The herd had consistently good production figures and had maintained excellent records for production and livestock health. There had been very few health issues in either adult cows or calves. Rates of lameness, mastitis and calf death were low. Calves were left on their mothers for about 1 week after birth.

The herd entered the MAP in 1998 and was assigned a herd status of monitored negative – 1 round of testing (MN1). This status was maintained for 12 years through biennial maintenance tests using the BJD ELISA test and property audits.

A homebred cow (Cow A) was born on 3 May 2003. This cow had reduced milk production in her 2011 lactation cycle. The cow had a negative BJD ELISA as part of MAP testing on 16 June 2011. The cow showed no signs of clinical disease until May 2012, when weight loss and a scour was observed by the farmer. This was investigated by a private vet, and a strongly positive ELISA test was obtained on 7 June 2012. By 26 June 2012 the cow had deteriorated and was lying on her side. She was euthanased. At necropsy there was marked thickening of the ileum. The carcass was emaciated and the bowel contents were watery. BJD was confirmed by laboratory testing.

The mother (Cow B) of the infected cow was also homebred and was born on 10 May 1999. She was culled from the herd on 8 August 2008 because of low production. There were two other daughters of Cow B. Closer examination revealed that both were starting to lose weight and their production figures had dropped. Two daughters of cow A in the herd were healthy and producing well.

Determining the origin of infection was impossible. The infected animal was homebred. Only 12 animals had been introduced to the herd in the last 25 years. Small groups of heifers had been purchased about 15 years previously from two herds in an adjacent district. Infection may have been brought in from these purchases, or it may have been present from when the herd was set up over 100 years ago.

The herd is likely to have been endemically infected at a low rate for a long time. The negative testing over many years suggests a low rate of spread within the herd. The failure of the MAP program to detect infection on this farm emphasises the weaknesses of BJD ELISA testing, especially when the

herd prevalence is low. The sensitivity of the BJD ELISA used by the NSW State Diagnostic Laboratory has been estimated to be 48.8%, but could be as low as 20% to 30%.

In itself, the diagnosis of BJD is not considered particularly significant by the dairy farmer, because he is principally in the business of producing milk and it is very unlikely he will see a significant rate of clinical BJD in his herd. His production levels are excellent. However, the diagnosis of BJD will have an impact on the farmer's trading. He has historically sold male calves and surplus heifers through the local saleyards. These cattle are of good quality and have been purchased by producers to grow out as vealers or steers or retain as breeders. Although dairy farms in NSW are not quarantined for BJD, the requirement to declare the BJD status of the calves on a DAS (Dairy Assurance Score) declaration form will stop many beef producers and most dairy farmers from buying the farmer's cattle. The farmer will now mainly sell his cattle direct to slaughter. He will continue to privately sell very young calves to local buyers, who will rear them to 80 kg before slaughter.

For further information contact Matthew Ball, Senior District Veterinarian, North Coast Livestock Health and Pest Authority, Lismore, on (02) 6621 2317.

Angus calves with extra limbs (polymelia)

Animal Health Surveillance 2011/3 reported surveillance for a genetic disease of Angus calves that causes an extra leg to be attached to the body.

As part of a breeding trial to determine the mode of inheritance of this condition, Dr Laurence Denholm at NSW DPI Orange is seeking to purchase live Angus heifer calves with polymelia (preferably with the additional limb or limbs on the head or the neck).

For further information contact Laurie Denholm, NSW DPI Orange, on 0418 641 957.

Getting information on animal diseases

This surveillance report can convey only a very limited amount of information about the occurrence and distribution of livestock diseases in New South Wales. If you would like more specific information about diseases occurring in your part of the state, contact your local Livestock Health and Pest Authorities District Veterinarian or Departmental Regional Veterinary Officer.

For statewide information, contact the Department of Primary Industries Animal and Plant Biosecurity Branch in Orange on (02) 6391 3237 or fax (02) 6361 9976.

For more information on national disease status, check the National Animal Health Information System (NAHIS) via the internet at:
<http://www.animalhealthaustralia.com.au/status/nahis.cfm>

This is a report under the Animal Disease Surveillance Operational Plan, Project 8, 'Reporting for Animal Disease Status in NSW'.

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**Copies of NSW Animal Health Surveillance reports are available on the internet at:
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