NSW GOVERNMENT

Information contributed by staff of
NSW Department of Primary Industries
and Local Land Services

NEW SOUTH WALES

ANIMAL HEALTH SURVEILLANCE

January–March 2016 » Issue 2016/1

In this issue

Anthrax report

During the quarter there were 2 anthrax incidents. In late February a total of 10 cattle died out of a herd of 230 in the Rankins Springs district of the Riverina Local Land Services. Although there was no recorded history of anthrax on this property, it is in an area with historical cases of anthrax occurring since 1970 and earlier. A neighbouring property had had cases in 1996 and 2005.

In mid-March, anthrax was diagnosed as the cause of death in 18 sheep out of a flock of 1197 in the Cumnock district of the Central Tablelands Local Land Services. This property had reports of anthrax in sheep in 1958 and 1961, but none had been recorded again until the current incident.

Immunochromatographic tests (ICTs) were used, with positive results in both incidents.

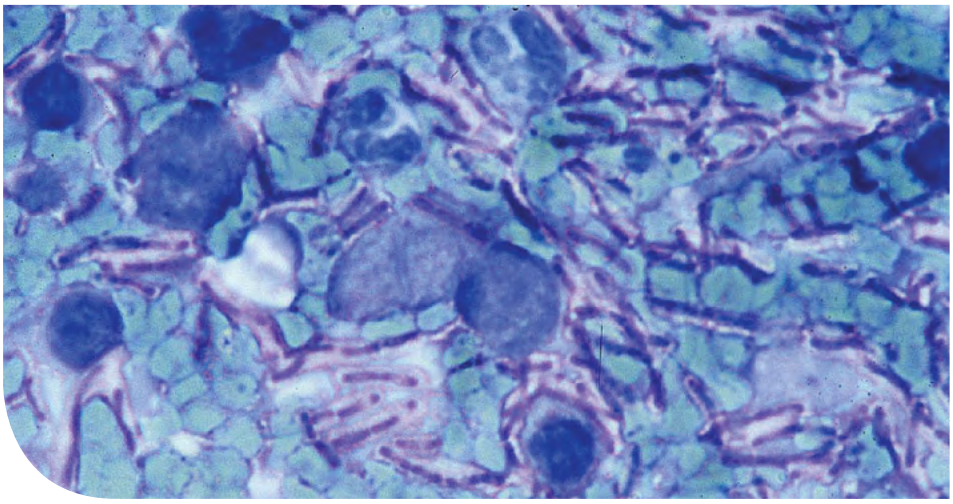
These cases were managed in accordance with DPI Anthrax Policy. Properties were placed in quarantine, carcasses were burned and in-contact equipment disinfected. All remaining at-risk animals on the properties were vaccinated.

During the quarter there were 25 investigations in which anthrax was excluded as a cause of death. Thirteen of these investigations involved cattle and 11 involved sheep. In the remaining incident five dogs had died.

Alternative diagnoses in cattle included ptaquiloside toxicity (from eating mulga fern, *Cheilanthes sieberi*), *Clostridium chauvoei* infection (blackleg) and mastitis. Alternative diagnoses in sheep included *Clostridium perfringens* infection (enterotoxaemia), haemonchosis (barber's pole worm infection), lactic acidosis and haemobartonellosis. No diagnosis was found for the dogs, but the problem was suspected to be rodenticide toxicity.

ICTs were used in 17 of the 25 exclusions, with negative results.

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



Encapsulated *Bacillus anthracis* (anthrax bacteria), stained with polychrome methylene blue, in a smear of a haemorrhagic lymph node. Photo B Moloney

Wildfowl mortalities on the South Coast

A member of the public reported 12 dead and four sick wild waterfowl close to a creek near Bateman's Bay in February 2016. There had been a similar event about 1 year previously, with no diagnosis made. Other bird species in an aviary on the property were not affected. Water flow in the creek where the affected birds were found varies depending on the seasonal conditions. One sick bird had a lot of saliva coming from its mouth, and the others couldn't move.

The primary alternative diagnoses in this case were avian influenza, Newcastle disease virus, toxicity (organophosphates, organochlorides, mercury, algal toxins, castor bean and lead) and botulism. Three birds were submitted to the State Veterinary Laboratory at the Elizabeth Macarthur Agricultural Institute at Menangle for necropsy and notifiable disease exclusion. There were no significant gross findings on necropsy. Cloacal and tracheal swabs were negative for avian influenza and Newcastle disease virus. Samples were forwarded to the Office of Environment and Heritage's Environment Protection Authority laboratory for pesticide screening. All samples tested negative for a broad range of organophosphates and organochlorides.

One of the sick birds was confined in a cage overnight and recovered without any treatment. In combination with the involvement of multiple bird species, the occurrence of the deaths in summer during a hot period around a water body, and a lack of gross findings on necropsy, this finding supports a diagnosis of botulism. Hypersalivation can occur in affected birds because of paralysis of the muscles involved in swallowing. Other clinical signs include progressive weakness and paralysis, inability to elevate the head, and closing of the third eyelid. Outbreaks can also present as a sudden increase in the number of dead birds, with no other clinical signs.

A blood test is available for detecting botulism toxin, but false positives and false negatives can occur. In this case it was not possible to submit samples to the laboratory within an appropriate time period to warrant testing for botulism toxin.

All dead birds were buried well away from the water body. No further deaths were observed. Removal of decaying plant litter from the creek has been recommended to reduce the likelihood of future outbreaks.

For further information contact Kate Sawford, District Veterinarian, South East Local Land Services, Braidwood on (02) 4842 2594.

Foot and mouth disease exclusion in the Central West

Local Land Services were called in to investigate an outbreak of skin lesions around the mouth and feet in a Merino flock in the Central West. About 500 out of 700 10-month-old lambs had developed scabby lesions on their lips and pasterns. The lambs had been vaccinated with Scabigard® at marking, as well as with 6 in 1 with vitamin B12. The lambs had been grazing on native pasture, with spiny burr grass present in the paddock. They had also been fed oats, barley and wheat in trails on the ground.

About 70% of the lambs had circular, raised, scabby lesions around their lips and nostrils. Some individuals also had similar lesions on the distal limbs, mostly along the coronet. Circular erosive lesions were seen on the gums of one individual.

Samples were collected and tested for foot and mouth disease, vesicular stomatitis, goat pox and bluetongue. All the results were negative. The scabs tested positive for orf virus, commonly known as scabby mouth.

Vaccine failure was investigated by the pharmaceutical company, and tests were performed on the batch used. No problems were identified with the batch, so it was assumed that an error in handling during transport or administration was to blame.

In this case, the presence of spiny burr grass in the paddock caused wounds that became entry points for the virus. The act of trail feeding caused close contact between large numbers of sheep, causing the virus to spread more rapidly through the flock than would normally be seen.

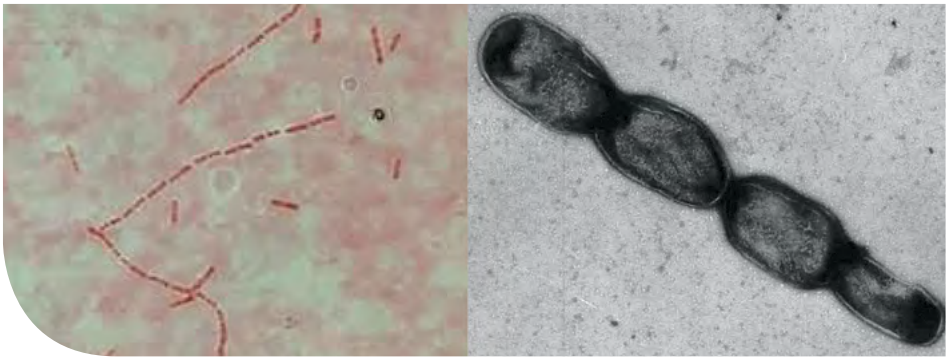
For further information contact Cecily Moore, District Veterinarian, Central Tablelands Local Land Services, Coonabarabran on (02) 6842 6600.

Scabby mouth: Coronet lesion on an affected lamb (left) and circular erosive lesions on the gums (right). Photos C Moore

Alysiella-associated bovine pneumonia in the Hunter

In 2015, two heifers on a property in the Hunter region failed to gain condition after being moved to fresh pasture, despite a good vaccination and worming history. One heifer subsequently died, with evidence on post-mortem of widespread petechiae (small haemorrhagic spots), most notable on the pleural lining of the lung. Marked thoracic and pericardial effusion was also noted, along with focal zones of inflammation and fibrinous effusion on the lung surface. Bacterial pneumonia and bracken fern poisoning were considered as possible diagnoses. The remainder of the herd was prophylactically treated with antibiotics, and no further cases were reported. Investigation of lung tissue and pleural fluid from the necropsied animal revealed a profuse growth of Gram-negative, haemolytic rod-shaped bacteria. Biochemical analysis of the bacteria identified an organism in the Neisseriaceae family. Biochemically similar bacteria had been cultured from septic bicipital bursas in lame Thoroughbred horses, also from the Hunter, in 2012. (The bicipital bursa is located over the shoulder joint; bursa infection can be associated with septic arthritis of the shoulder.) Whole genome sequencing of strains from both the bovine pneumonia and equine arthritis cases revealed entirely new species of bacteria from the genus *Alysiella*. Members of this genus are normally found as commensal organisms in the mouths of mammals. Septicaemic infections with *Alysiella* species have not been reported previously, and work is ongoing to determine what makes these novel species cause disease.

For further information contact Cheryl Jenkins, Senior Research Scientist, DPI Menangle on (02) 4640 6396 and Jim Kerr, District Veterinarian, Hunter Local Land Services, Paterson on (02) 4939 8967.



Filaments of *Alysiella bacilli* isolated in pure culture from the lung tissue of an affected heifer. Left: viewed under a light microscope with Gram staining. Right: viewed under an electron microscopy with negative staining. Photos: C Jenkins and M Srivastava

Blackleg deaths in the Illawarra

Calf deaths due to blackleg occurred on three properties in the Gerringong–Jamberoo locality.

Features common to all three outbreaks included sudden death of calves in good condition (generally those in better condition out of the group), high mortality rates (25% to 50%), and poor or inadequate vaccination histories. On all three properties there had been strong surveillance collaboration with local vets. Although the deaths occurred in an area where anthrax had not previously been confirmed, on one of the properties tests were run to exclude this disease.

In the first outbreak, nine calves aged 7 to 9 months died from a total group of 33 over the course of a week. Calves either died suddenly or were observed to be lame in a single limb for a brief period before death. The calves had received only an initial clostridial vaccination about 5 months beforehand, with no follow-up course of vaccine. Typical post-mortem findings included bloody, frothy nasal discharge; rapid onset of bloating and autolysis (tissue self-destruction), with crepitus (crackling sounds indicating the presence of gas in the tissues) over the affected shoulder or hindlimb; and a dark haemorrhagic appearance of the underlying affected muscle. The presence of *Clostridium chauvoei*, the cause of blackleg, was confirmed by anaerobic culture of both the liver and affected muscle tissue.

In a similar second outbreak, six calves from a group of 25 that were also 7 to 9 months old died, with no prior clinical signs, over a 3-day period. Again the calves had been given only a single dose of clostridial vaccination, in this case about 4 months before the deaths. Adult cattle running in the same mob as the calves remained unaffected. The whole group had been grazing the same kikuyu and ryegrass paddock for some weeks before the deaths; they had no access to potentially poisonous plants or toxic chemicals.

Again, post-mortem decomposition was rapid; in this instance the affected muscle areas were confined mainly to the thoracic cavity—particularly the diaphragm and intercostal muscles.

In the third outbreak, six 12-month-old mixed-breed steers and heifers from a herd of 60 died, again with no prior clinical signs, over a 3-day period. Affected carcasses featured bloody nasal and anal discharges, rapid autolysis, and congested lungs; one animal had splenomegaly (enlarged spleen). As the owner had initially advised that the whole mob had been revaccinated with a clostridial vaccine only 3 weeks beforehand, it was considered wise to exclude anthrax as a precaution.

Intercostal muscle lesions in *Clostridium chauvoei* infection. Photo S Whittaker

Further investigation subsequently revealed that staff had failed to revaccinate a small mob of nine animals that were part of the larger group of 60; all six deaths occurred in the animals that were part of this small group!

Interestingly, as others have previously reported, all three incidents occurred following a period of heavy rainfall.

Follow-up clostridial vaccination appeared to have been successful in quickly halting further deaths in all three herds.

For further information contact Steve Whittaker, District Veterinarian, South East Local Land Services, Berry on (02) 4464 6012.

Beef cattle health surveillance in the Mudgee region

The results of a surveillance project in the Mudgee region will be used as a basis for discussing endemic diseases with cattle producers. The project, which is financed by DPI's targeted surveillance funding, looked at bovine viral diarrhoea virus (BVDV), *Leptospira pomona*, *Leptospira hardjo*, liver fluke, *Theileria*, selenium, and vitamin B12 in home-bred beef cattle. Although only a small number of herds were tested, the resulting endemic-disease prevalence data, which are both local and current, are a valuable resource, particularly for use in group extension activities.

BVDV prevalence was found to be consistent with levels reported elsewhere, with 75% of herds having some level of exposure and 50% of the 82 tested animals having detectable antibody. Key messages for beef producers reinforced by this data are 1) BVDV infection is common in beef cattle herds; and 2) within-herd exposure rates can vary markedly between herds, so management plans should be developed on a case-by-case basis.

Little evidence of *Leptospira* infection was found. Of 55 samples tested, all were negative (microscopic agglutination test [MAT] titre <50) for *L. pomona* exposure and only one low-positive *L. hardjo* titre was detected. These results indicate that exposure to these to *Leptospira serovars* is uncommon in the Mudgee region. It is possible that transmission of leptospirosis may become more frequent if interactions between feral pigs and cattle increase.

Nearly half the herds tested had serological evidence of medium to high liver fluke exposure. In many cases, positive results occurred in areas

where liver fluke was not thought to be present, suggesting that production losses from subclinical infection may be common.

Selenium status (as measured indirectly by assessing levels of the enzyme glutathione peroxidase) was low in 78% of cattle tested, and a number of extremely low levels were found. Selenium deficiency was found on properties across the region in cattle grazed on a variety of land and pasture types. Despite this, clinical selenium deficiency is rarely diagnosed in the district. Vitamin B12 levels were normal in 98% of cattle.

No previous *Theileria* prevalence data exist for the Mudgee region; anecdotal evidence suggests that clinical disease is rare and sporadic, and that the organism is not endemic in the area. For this project, *Theileria* prevalence was estimated by using polymerase chain reaction (PCR) on pools of 10 blood samples collected in tubes containing EDTA (a chemical used to prevent the blood samples from clotting). The use of PCR on such pooled samples has not yet been validated, but validation testing of

Blood sampling for the beef cattle health surveillance. Photo N Gillan

individual samples demonstrated that 1 positive sample in a pool of 10 would be likely to contain enough *Theileria* DNA for detection. Two out of nine herds had detectable *Theileria* DNA in the samples tested.

The results have already provided a useful discussion point around endemic disease recognition and management. A beef producer group will be formed to promote an evidence-based approach to herd health management and disease treatment and prevention. This project, though limited in scale, has helped establish and strengthen links with beef producers, private vets, stock agents and rural suppliers. Such networks, if maintained, are likely to enhance both endemic disease management and disease surveillance through improved producer knowledge and increased disease reporting.

For further information, contact Nigel Gillan, District Veterinarian, Central Tablelands Local Land Services, Mudgee on (02) 6378 1705.

Trichomoniasis diagnosed on two Central Tablelands beef properties

Trichomoniasis was diagnosed in a herd of 80 mature Angus cows, 69% of which were found to be pregnant when scanned in mid-January 2016. At scanning there was evidence of non-viable fetuses in an additional four cows. The cows were in good body condition when first joined to three, then two, Angus bulls for 9 weeks. *Neospora, Leptospira pomona,* campylobacteriosis and selenium deficiency were excluded as possible causes of the infertility. Two of eight cows tested had evidence of recent pestivirus infection, indicating that pestivirus may have played a role in this case.

As the herd's owner had leased the bulls from a nearby property, a sample of the highest-risk bulls was also tested for trichomoniasis. About 10% tested positive.

A management plan was discussed for both properties. The intention is to use young bulls wherever possible and to use only older bulls if they have tested negative for trichomoniasis on sequential tests. Both owners were advised to pregnancy test cows twice to remove any cows that were not pregnant and cows that appeared to be aborting.

Fortunately all non-pregnant cows from both properties have been sold to slaughter, reducing the risk of the disease spreading to other properties. Trichomoniasis is a notifiable disease in NSW, but affected properties are not quarantined.

For further information, contact Bruce Watt, Team Leader Central Tablelands Local Land Services, Bathurst on (02) 6333 2303.

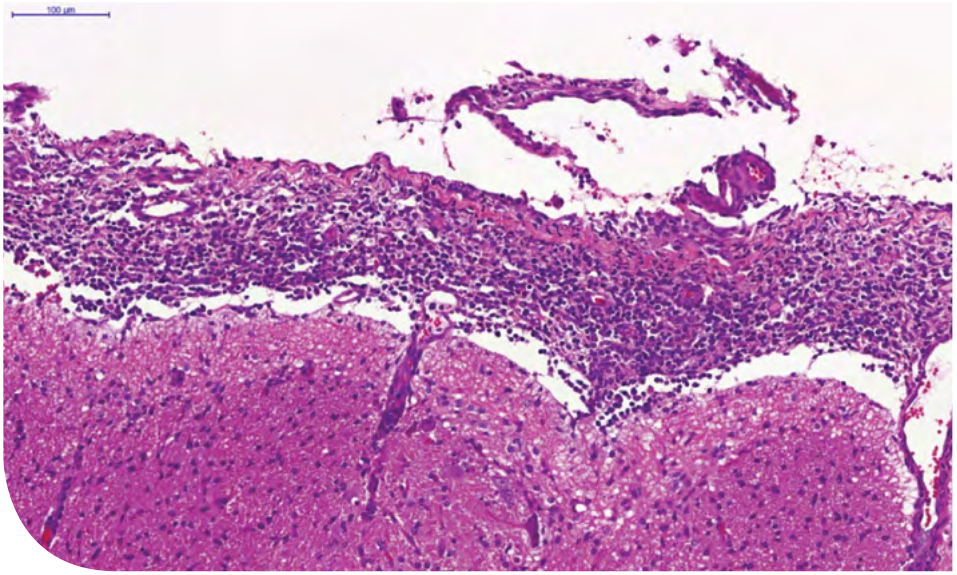

Testing a bull for trichomoniasis. Photo: B Watt

Klebsiella outbreaks causing septicaemia in sucker pigs

In January and February 2016, three separate outbreaks of septicaemia due to the bacterium *Klebsiella pneumoniae* were reported in pre-weaned pigs—one each in Victoria, Queensland and NSW. Mortalities were as high as 50% to 100% of piglets in some litters and occurred in indoor housed herds with good hygiene. Similar septicaemia in pigs has been reported recently in East Anglia in the UK. The East Anglia case definition is 'sucker pigs found dead with lesions consistent with septicaemia and pure/predominant growths of *Klebsiella* isolated from internal sites in multiple pigs'. This was consistent with the Victorian and Queensland experience.

In the Australian cases, affected pigs were 1 to 4 weeks old and had been in good condition before sudden death. Post-mortem examinations were consistent with septicaemia; however, some cases were reported to be non-specific, with the presence of fibrin strands in the abdominal cavity as the only common finding. The bacterium *K. pneumoniae* was isolated (in heavy and almost pure growth) from a wide range of tissues, including the liver, lung, kidney, heart, intestine and brain. Similar outbreaks had occurred in the Queensland herd over summer in 3 of the last 5 years. In the UK this disease syndrome occurred over successive summers, but only in outdoor herds. *Klebsiella pneumoniae* more commonly causes sporadic disease in individual pigs, often in association with other diseases like mastitis or pneumonia. *Klebsiella pneumoniae* can also be found in the intestines of healthy pigs.

Factors that may have contributed to the Victorian outbreak include the high number of gilt litters farrowed down (50%) and hot weather (42°C). Sows and gilts were cooling themselves by playing with the drinkers in the farrowing house, causing significant wetting of the pens; staff dried the pens by throwing down sawdust, which is an ideal environment for the survival and multiplication of *K. pneumoniae*. The outbreak in Victoria was pulled up very swiftly with hygiene modifications and treatment of the sows and suckers with neomycin. The sawdust was replaced with a medicated bentonite (Staldren®). However, as the sows and piglets were being treated with the antibiotic at the time the Staldren was introduced it wasn't possible to demonstrate its efficacy, although it is certainly preferable to sawdust. In the early stages the septicaemia also affected pigs that had been moved into the weaning shed. The medication has now been withdrawn from the suckers, with no reoccurrence of disease, and it will soon be removed from the lactation ration.



Meningitis in the medulla of the brain of a pig with *Klebsiella pneumoniae* septicaemia. Photo E Bunker

Factors that may have affected the Queensland outbreak include the additional infection of pigs with encephalomyocarditis virus and non-haemolytic *Escherichia coli*, as well as floods in the first year in which outbreaks of septicaemia were observed, and recent problems with rodent eradication. Apramycin treatment of piglets was able to reduce scouring.

Klebsiella pneumoniae can also cause infection in humans. These infections are most commonly acquired in hospitals—especially in immunocompromised patients. However, there is no evidence to suggest that infected pigs are a source of infection in humans, and fortunately the antimicrobial resistance patterns in *Klebsiella* isolated from pigs have not shown the widespread resistance found in human isolates.

The reason for the septicaemia outbreaks in pigs has not yet been uncovered, but the disease has been controlled on farm with either apramycin or neomycin, making antibiotic sensitivity testing a necessity. *Klebsiella* are innately resistant to ampicillin and other beta-lactam antibiotics. One *Klebsiella* isolate from the recent outbreaks in Australia has also demonstrated resistance to sulfafurazole and trimethoprim and partial resistance to neomycin.

Surveillance by DPI has investigated the antimicrobial resistance of all of the *Klebsiella* isolated and is examining whether antimicrobial sensitivity is stable over time. DPI is also currently typing *Klebsiella* strains from all of the recent Australian outbreaks to compare the sequence types of the Australian strains with each other and with the strains from the outbreaks in the UK. Multi-locus sequence typing determines the genetic relationships between bacterial isolates on the basis of differences in the DNA sequences of several 'housekeeping' genes. All *Klebsiella* isolates causing septicaemia in the UK belong to sequence type 25. These genetic epidemiological studies may help determine the source of the outbreak, and whether there is a common link.

If vets observe sudden deaths in pre-weaned pigs with septicaemia, they should submit tissues from freshly dead animals for bacterial culture and fixed tissues for histopathology.

For further information, please contact Alison Collins, Senior Research Scientist, DPI Menangle, on (02) 4640 6306, or the State Veterinary Diagnostic Laboratory at Menangle on (02) 4640 6325.

Infectious laryngotracheitis in backyard poultry

In March 2016 in the Finley area, about 12 chickens in a backyard pen were reported to be having breathing difficulties. Several other pens of chickens, ducks and other birds present on the farm had no clinical signs.

The affected pen contained the youngest pullets on the property, with a mixture of Australorps, Lacewing Wyandottes and other breeds. Although this was a mixed pen there had been no new additions to it in the last 5 months. A pullet had died the night before, but the owner had assumed that this was simply related to the intense heat.

The district vet was called to examine the gasping birds. Signs at this time seemed fairly mild, with only a slight clear nasal discharge from some birds and no signs of pus or swollen eyelids. One of the birds had a temperature of 42.4°C. Tracheal and cloacal swabs were taken, put into viral media, and sent to the lab to test for exotic avian influenza and Newcastle disease as well as endemic infectious laryngotracheitis (ILT), all of which are notifiable in NSW.

The owner reported that three birds died the next day. One was brought to the Local Land Services office for a post mortem. The lab results and the post mortem both confirmed ILT, an endemic herpes virus notifiable in NSW because of the need to protect the commercial chicken industry.

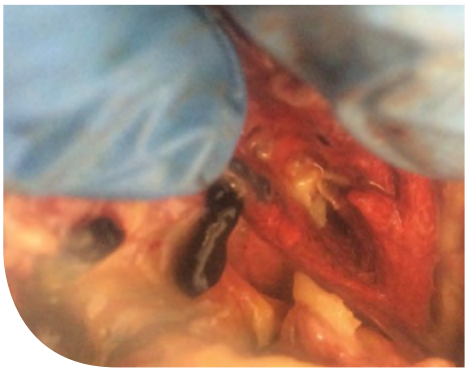
The pathogenicity of different strains of ILT varies greatly, with three common disease groups: peracute, subacute, and mild or chronic. Peracute illness may result in up to 70% deaths; death usually occurs from suffocation from blood clots or exudate.

A vaccine is available for commercial quantities of poultry but not for small-scale farm use.

In this case all the chickens in the affected pen were euthanased by the owners, who breed show birds and wanted to remove the risk of affected chickens becoming carriers and shedding virus at poultry shows.

No further reports of clinical signs or deaths have been reported at this time.

For further information contact Linda Searle, District Veterinarian, Murray Local Land Services, Deniliquin on (03) 5881 1055.



Membrane inside the lung bronchioles of a chicken affected by ILT. Photo L Searle

Post-mortem photo of a Lacewing Wyandotte, showing a diptheritic membrane in the trachea. Photo S Osborne

Oyster mortalities in NSW estuaries

Pacific oyster mortalities

Between February and March 2016, numerous reports were received of major mortality events in farmed Pacific oysters from growers in the Clyde, Crookhaven and Tweed rivers and the Port Stephens estuary. These reports came quickly after DPI called for increased industry vigilance in reporting any Pacific oyster mortalities after confirmation of the presence of Pacific Oyster Mortality Syndrome (POMS) for the first time in Tasmanian farmed oysters.

In NSW, mortality rates of up to 95% were observed on some oyster leases. Samples of Pacific oyster from each affected area were sent to the NSW DPI Virology Laboratory at the Elizabeth Macarthur Agricultural Institute to exclude ostreid herpesvirus (OsHV-1), the cause of POMS.

All samples submitted from the mortalities in NSW were negative for OsHV-1. Examination of affected oysters by histopathology revealed no evidence of specific transmissible disease agents. However, mortality was always preceded by prolonged warm-water conditions and sometimes by other environmental disturbances such as severe salinity decline.

OsHV-1 is present in three NSW oyster-growing estuaries, namely the Hawkesbury and Georges rivers and Brisbane Water. This virus has also been detected in association with deaths in wild Pacific oysters in the Parramatta River. However, in February 2016 the Tasmanian oyster industry was devastated by its first POMS detection. The impact of the Tasmanian outbreak has extended to NSW Pacific oyster growers, as Tasmania was previously a major supplier of triploid Pacific oyster spat for NSW.

Sydney rock oyster: QX disease

Ongoing losses of Sydney rock oysters between January and March were reported from the Richmond River, with all growers there observing stock losses in cultured Sydney rock oysters; greater than 60% mortality was noted in wild Sydney rock oysters. In the Hawkesbury River there were up to 50% losses of cultured stock.

Samples were submitted to the Elizabeth Macarthur Agricultural Institute by an oyster farmer on the Richmond River who had suffered 70% to 80% mortality in stock 12 to 36 months old, as well as by a farmer on the Hawkesbury who had experienced 50% mortality in 12-month-old stock. In both cases, laboratory diagnosis confirmed the presence of QX disease by cytology: sporulating forms of the protozoa causing the disease, namely *Marteilia sydneyi*, were seen.

QX disease is endemic in certain NSW estuaries, including those of the Richmond and Hawkesbury rivers. Oyster movement is restricted. There are three levels of QX risk for NSW farming estuaries, with movement permitted only between estuaries of the same risk category or from a lower to a higher risk category.

QX disease occurs when the protozoal parasite sporulates in affected oysters, destroying the epithelium of the digestive gland and starving the oyster. Affected oysters frequently have a very pale tan (rather than dark brown) digestive gland. Disease is generally observed through late summer and autumn. Prolonged decreases in salinity after significant, repeated rainfall events have also been identified as a risk factor for outbreaks of QX disease.

For further information contact Jeffrey Go, Veterinary Officer, Aquatic Biosecurity, EMAI, DPI Menangle on (02) 4640 6310.

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.

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.

If you would like more specific information about diseases occurring in your part of the state, contact your Local Land Services District Veterinarian or the Department of Primary Industries Senior Veterinary Officer for your region, or go to: *www.lls.nsw.gov.au*

For more information on national disease status, check the National Animal Health Information System (NAHIS) via the internet at: *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: *www.dpi.nsw.gov.au/newsletters/animal-health-surveillance*

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