QUARTERLY REPORT OF INVESTIGATIONS OF SUSPECTED EXOTIC DISEASES

Vesicular disease ruled out

A Northland veterinarian phoned the MAF exotic pest and disease hotline after receiving a negative test result for bovine viral diarrhoea virus (BVDV) antigen by ELISA from an eight-month-old Hereford heifer with oral erosions, diarrhoea and ill-thrift. An AsureQuality Initial Investigating Veterinarian (IIV) promptly visited the farm under the direction of an Incursion Investigator. The calf had healed and active erosions and crusting on the nasal planum, nares, rostral tongue margin and hard palate. The remaining livestock on the farm (about 80 cattle) were inspected and the 28 in-contact animals yarded for clinical examination including measurement of rectal temperatures, but no abnormalities were identified. Exotic vesicular disease was excluded on clinical and epidemiological grounds. Later the heifer was euthanased, a full post-mortem examination was carried out and fresh and fixed tissue samples collected. Gross post-mortem findings were restricted to the oral cavity and oesophagus. Changes included superficial ulceration on the tip of the tongue, hard palate, and sublingually; and fibrin-coated ulceration affected the entire lining of the oesophagus. Histologically the lesions were focal to locally extensive ulcers, filled with granulation tissue containing a variety of white blood cells, debris and bacteria, with hyperplastic edges indicating early repair. Serum biochemistry was normal and molecular assays for malignant catarrhal fever and BVDV carried out on serum and a range of affected tissues gave negative results. Similarly, no cytopathic effects were seen during virus isolation on primary lung cells, and virus cultures were negative for pestiviruses by immunoperoxidase staining and PCR. Given the negative test findings, the lesions were suspected to have resulted from ingestion of a local physical, caustic or chemical irritant. Exotic diseases were excluded and the investigation was stood down.

An export abattoir supervising veterinarian phoned the MAF exotic pest and disease hotline after finding a tongue lesion in a single prime steer from a mob of 53. There were about 10 circular raised granulating lesions, all less than 10 mm in diameter, affecting the dorsal aspect of the tongue. Photographs were submitted to an Incursion Investigator. The line was halted while under the direction of an Incursion Investigator and ante-mortem inspection of the remaining in-contact steers (n=14) was repeated, and detailed inspection of all tongues, buccal tissues, feet and offal from those already slaughtered (n=39) was carried out. Voluntary interim containment was instituted by the supervising veterinarian, meaning that personnel or containers of packaged meat or offal for rendering were permitted to leave the premises. The Incursion Investigation team examined the photographs and considered the lesions typical of actinobacillosis (wooden tongue).

Using the Animal Status Declaration form, the steers were traced back to a single farm of origin and the farmer was contacted and interviewed. The farm was part of a large integrated unit that finished cattle from other properties in the same farming enterprise. The steers had been part of a larger group of about 400 that had been on the farm for more than two years, with no other cattle added during this time. This mob was the last of the steers to go to slaughter, with no more remaining on the property. All the others had been routinely slaughtered, with no abnormalities detected. The farmer said that a number of the animals under investigation had been grazing a rough hill paddock with dead sprayed gorse in the pasture. He was able to confirm treating three to five cases of wooden tongue each year. Given the clinical presentation, the farm's risk profile (including the history provided by the farmer), and the absence of further lesions after full examinations undertaken by the supervising veterinarian, voluntary restrictions were lifted. Samples of affected tongue tissue were submitted to the the Investigating and Diagnostic Centre (IDC) laboratory at Wallaceville for histological and bacterial assessment. Histological examination confirmed the presence of multifocal pyogranulomatous inflammation and eosinophilic colonies, characteristic of actinobacillosis (wooden tongue). Bacterial culture confirmed the presence of *Actinobacillus lignieresii*, the causative agent of actinobacillosis. No evidence of an exotic or emerging disease was identified and the investigation was stood down.

A veterinarian contacted MAF after four cases of malignant catarrhal fever (MCF) were diagnosed on a dairy farm of 1100 animals in Canterbury. The presentation of the disease was unusual as three of the

Exotic disease investigations are managed and reported by MAF's Investigation and Diagnostic Centre (IDC) Wallaceville. The following is a summary of investigations of suspected exotic disease during the period from April to June 2011.

four affected animals had recovered over the preceding six weeks. MCF usually has a high mortality rate and is generally sporadic, although outbreaks have been reported. All four of the animals had corneal opacity and nasal discharge. None exhibited mouth lesions during the course of the disease, nor did they show signs of pyrexia, lymphadenopathy or diarrhoea. There was no production loss in the herd as a whole.

Based on epidemiology, clinical signs and case history, exotic disease could be excluded. Serology was performed on the fourth case for bovine viral diarrhoea (BVD) and infectious bovine rhinotracheitis (IBR). An ELISA test for BVD antigen was negative, ruling out mucosal disease as a cause of the clinical signs. IBR ELISA testing was positive, but as IBR is common in the NZ herd, this could only be interpreted as a sign of previous exposure to the disease. Whole blood was available from the fourth case, and tested positive by PCR for MCF. The investigation was stood down as an endemic differential was confirmed and exotic disease excluded based on epidemiology and clinical signs.

Haemorrhagic septicaemia excluded

A Gribbles pathologist reported a disease outbreak in five-month-old calves where pleurisy and peritonitis were key features. *Pasteurella multocida* was cultured from tissues from affected calves by Gribbles Veterinary Pathology and the IDC. The outbreak occurred in calves born during spring 2010. Three out of 90 calves (3 percent) died acutely over a two-day period. During the two days immediately before the outbreak there had been severe inclement weather that may have acted as a stressor for the calves. A *P. multocida* capsular serogroup specific multiplex PCR amplified a capsular type B specific product from the *P. multocida* isolate. A HS-B PCR was negative for all samples tested. Hence, the *Pasteurella* species isolated from calves from the outbreak was a non-haemorrhagic septicaemia strain of *P. multocida*.

A Gribbles pathologist reported isolation of *Pasteurella multocida* from the stomach contents of an aborted bovine foetus. This organism is not considered to be a normal cause of bovine abortion. Further typing of the organism was carried out to determine whether it was the same organism associated with recent outbreaks of pleuritis and peritonitis in calves caused by non-haemorrhagic septicaemic strains of *P. multocida* type B. The isolate was identified as a type A strain of *P. multocida*, so it is unlikely to have been a primary cause of the abortion.

Taenia saginata confirmed

The New Zealand Food Safety Authority requested assistance in investigating six cases (five confirmed, one highly probable) of *Taenia saginata* (*Cysticercus bovis*) infection in cattle in the Marlborough area since September 2008, including two cases since November 2010. The animals with suspicious lesions were rising-two-year-old beef cattle. Histopathology confirmed that the lesions were consistent with *T. saginata* infection. *T. saginata* is a zoonotic infection spread by exposure of cattle to eggs or proglottids released in the faeces of infected humans. Sporadic cases have been identified in cattle in New Zealand, and are of interest for reasons relating to market access and meat quality. A large outbreak occurred in Southland in 2009 (Bingham, 2010). On the Marlborough properties, exposure to risk factors such as leaking septic tanks or unhygienic toileting practice was generally minimal, and investigation and tracing did not detect any confirmed animal, human or feed-source links between the properties concerned, although stock on two properties had access to the same watercourse, and all had vineyards on or adjacent to the property where cattle grazed. It is possible that infection was introduced by a vineyard worker, who may have been exposed overseas. No common vineyard contractors between the properties have been identified, although complete information is not available. It was determined that owing to grazing and feeding practices, and the assumed age of the lesions based on histopathology, all cattle on the affected properties at the time of investigation were potentially exposed. Advice on *T. saginata* prevention and hygiene was provided to all livestock managers.

Mycoplasma bovis investigated

A pathologist notified IDC Wallaceville of a rising-two-year-old dairy heifer with microabscesses in the lung. This was the only animal affected from a herd of 200. The pathologist advised IDC that the gross pathology of the lung and lesions present on histology were similar to that expected with an infection of *Mycoplasma bovis*. However, when infection with bovine viral diarrhoea virus (BVD) is combined with secondary infection by *Pasteurella haemolytica*, it cannot be distinguished histologically

from infection caused by *M. bovis*. Unfortunately lung tissue (the only tissue available for further testing) was lost during the Christchurch earthquake and no follow-up testing could be carried out. No further cases occurred on this property.

Brucella abortus excluded

The IDC Animal Health Laboratory reported that two out of 124 sera received for screening tests were positive for *Brucella abortus* using the CFT, although both were negative when positive sera were retested using the ELISA. The animals were undergoing progeny testing at an AI collection centre, and were tested as part of a property health accreditation scheme. Later, two more animals from a subsequent submission from the remainder of the same bull herd were weakly positive to both the CFT and ELISA. No health concerns had been reported in the herd. All four animals were subsequently re-bled six weeks later, and one was seronegative to both tests. Semen and faeces were submitted from the remaining three animals, and these were now CFT-negative but ELISA-positive. All semen tested PCR-negative for *B. abortus* in a nested *Brucella* PCR. The faeces yielded a heavy mixed growth, but no *Yersinia enterocolitica*, an organism previously associated with *B. abortus* seropositivity. Subsequently further sera were collected and samples tested negative by CFT and ELISA. The herds of origin from these animals have had a history of high reproductive performance, as determined by pregnancy rates and low rates of abortion. Given the number of previous negative herd tests on the property, negative semen tests of those animals with initial positive serology, low CFT titres and high reproductive performance in the herds of origin, it is likely that the seropositive results were due to a cross-reaction with an endemic organism.

Border disease infection in cattle confirmed

A Gribbles veterinary pathologist reported a beef-breeding bull that was persistently infected with Border disease virus (BDV). Reports of naturally infected cattle with BDV are uncommon in the literature. Poor reproductive performance (pregnancy rate of 23 percent for 57 days) occurred in dairy heifers exposed to the bull persistently infected with BDV from a team of three sires used to mate the heifers. A high prevalence (39/40, 98 percent; 95 percent CI, 87–100 percent) of heifers had serological evidence of exposure to BDV. Border disease virus was not detected in the ear-notches of six calves born to heifers exposed to the affected bull during the early mating period. There was no evidence of BDV circulating between cattle on the farm of origin of the affected bull. No BDV was detected in serum collected from all calves and adult animals present on the farm of origin during 2010. BDV was circulating in sheep, as shown by multiple ages of sheep being affected and the prevalence of exposure increasing with age of sheep. Exposure events between sheep and cattle on this property were thought possible, as cattle and sheep shared grazing during pregnancy. It is possible that infection in cattle with BDV may be a low-probability event, with transmission of infection requiring other factors additional to shared grazing.

Phylogenetic analysis of the isolate from the affected bull revealed that it could be allocated within the BDV species in the same cluster of the BDV-1 group as New Zealand isolates reported by Vilček *et al.* (1997).

Chronic wasting disease ruled out

A MAF Verification Agency veterinarian at a meatworks in Invercargill rang the MAF exotic pest and disease hotline to report one red deer hind from a line of 30 that was exhibiting neurological signs at ante-mortem inspection. The hind was in moderately poor body condition and exhibited a wide-based stance, muscle tremors, lip-licking, head-down posture (even during movement) and constricted nostrils. The property of origin had a history of copper deficiency, but had changed from a bullet to an injectable copper treatment this year, leading to the suspicion that demyelination associated with copper deficiency might have caused the signs. Specimens were referred to Gribbles Dunedin for histopathology, and to the MAF AHL for Bio-Rad TSE ELISA to exclude CWD. Histopathology showed no significant lesions in brain or other tissues, and the ELISA was negative, excluding chronic wasting disease as the cause. Serum biochemistry showed elevated muscle enzymes, mildly low serum copper and significantly depleted serum calcium. It was later determined that the animals had travelled a comparatively long distance. Together with the biochemistry results, this suggested transit tetany (hypocalcaemia) as the most likely cause of the neurological syndrome, although copper deficiency may also have contributed to the clinical syndrome.

Stag infertility investigated

A Massey University clinician phoned the MAF exotic pest and disease hotline after identifying motile rod-shaped bacteria in semen collected by electroejaculation from a stag. This animal was one of two being investigated for fertility problems after poor conception rates in the 2010 season. One animal had numerous shallow ulcerative lesions on the prepuce. There were no penile lesions. The semen samples were submitted to the IDC Wallaceville. Testing excluded *Trichomonas* spp., *Campylobacter foetus venerealis* and *Brucella* spp., and identified a heavy, mixed infection of gram-positive and gram-negative bacteria, indicating gross contamination of the sample. In such cases motile bacteria are not unexpected. Serological testing carried out by New Zealand Veterinary Pathology identified no antibodies to *Brucella ovis*, *Neospora* spp., *Leptospira interrogans, L. hardjobovis* and *L. pomona,* while low titres to *Toxoplasma gondii* (1:16, 1:32) were identified in both stags. Serum was negative for bovine viral diarrhoea virus antibodies and antigen. The serum-neutralisation test for cervine herpesvirus (CvHV-1) antibodies identified titres (1:256, 1:96) in both stags, and the animal with the preputial lesions had the higher titre.

Subsequently both the stags that had run with the poor-conceiving hinds were resampled. Semen was collected from both and a preputial scraping was collected from the second stag, which still had ulcerative prepuptial lesions. This repeat testing similarly excluded pathogenic bacteria. Virus isolation from all samples on primary bovine lung cells gave negative results and a molecular assay for cervine herpesvirus was also negative. A generic *Mycoplasma* spp. PCR was positive but sequencing did not enable specific typing, indicating a mixed mycoplasmal infection. Examination of the resampled semen identified sperm with good motility and morphology in both stags. Although the preputial lesions could not be attributed to herpesvirus infection, there was evidence of exposure and the potential for mating behaviour to have been affected. Ocular and genital lesions have been described in association with CvHV-1 infection in New Zealand, although no effect on fertility has been established (Morgan *et al*., 2010; Wilson *et al*., 2005). No evidence of an exotic or emerging disease was identified and the investigation was stood down.

Kunjin virus ruled out

A member of the public reported neurological signs in a six-month-old Thoroughbred filly. The filly had been imported, along with her dam, from New South Wales, Australia. In the week preceding the notification there had been a number of reports of unusual neurological signs in horses in eastern Australia. In all of these cases Hendra virus had been excluded. On 1 March 2011, the affected filly and her dam were flown from Scone, NSW, to Auckland (with a one-night adjustment) and were then transported to Hawera, Taranaki. On 7 March mild ataxia and incoordination was noted, and it progressed over the next two days to moderate ataxia and some signs of colic. Signs of hypersensitivity of the skin around the hind legs were noted, there were signs of self-trauma, and a mucoid nasal and ocular discharge was present. Rectal temperature remained normal throughout the course of the condition, as did appetite. Samples were collected to rule out active infection and shedding of several potential viral aetiologies. Both the mare and filly were negative for Ross River virus, Murray Valley encephalitis virus, West Nile virus, Kunjin virus, alphaviruses and flaviviruses, based on PCR and VNT. Virus isolation was also negative for all viruses. Blood biochemical parameters and haematology were normal except for a significantly low selenium level in the foal and moderately low level in the dam. By 15 March the filly had completely recovered. The dam and other horses in the consignment remained unaffected throughout the investigation. The investigation was stood down.

Equine mortality investigated

On 4 April 2011 a Verification Agency (VA) veterinarian called the MAF exotic pest and disease hotline to report the death of three horses. The horses came from Cambridge and were part of a consignment to be slaughtered for the export market. All horses were inspected upon arrival at the abattoir, with no signs of disease detected; however, some of the horses were underweight. The following morning three horses, which had high body condition scores, were found dead in the paddock. None were able to be sampled for testing as they were disposed of before the VA was notified. The affected horses came from properties with no history of disease in any horse prior to shipment and they had been declared in good health pre-transport on the required documents. There were no imported horses on the properties of origin. All in-contact horses from the same consignment

were examined and found to be clinically normal. Blood was collected from the in-contacts and indices for biochemistry and haematology were found to be within the normal reference range. No abnormalities were detected in these horses when inspected on the slaughter line. There was no indication that the deaths were due to an exotic disease and the investigation was stood down.

EIA/EVA ruled out

A Gribbles veterinary pathologist reported a six-year-old imported Arab gelding that was intermittently febrile and colicky. The horse had attended numerous events where horses of differing vaccination status and internal parasite burdens were co-mingled. It was de-wormed, but a week later was depressed, pyrexic and colicky, with pale mucous membranes, although gut sounds were still considered normal by the veterinarian. Treatment with anti-inflammatory medication and antibiotics did not produce the expected improvement, and further diagnostic testing was performed at Gribbles. The attending veterinarian also reported seeing similar cases of decreased response to empirical/supportive treatment in horses with more typical viral respiratory disease at other locations in his practice area. Equine viral arteritis (EVA), equine infectious anemia (EIA) and infection with *Babesia* spp. were considered possible exotic differential diagnoses. As a compartmentalised bacterial infection was also a differential for the recurrent pyrexia and colic, culture for *Salmonella* spp. and *Campylobacter* spp. was performed (though shedding of these organisms can be intermittent, so culture is not considered to be a sensitive method of detection). Testing was done on both the imported gelding and another horse with similar clinical signs from a different farm in the practice area. Both horses were negative for EIA by AGID, for bacterial enteritis by fecal culture, for EVA by PCR and VNT, and for *Babesia* by ELISA. Although both horses were negative for EHV-1 and EHV-4 by PCR, both were positive for EHV-4 by ELISA. The gelding was also positive for EHV-1 by ELISA. Both horses recovered uneventfully during the following weeks, with no further relapses of pyrexia. The investigation was stood down once exotic diseases had been ruled out. The possibility was discussed among several equine veterinarians that there may be a more pathogenic strain or strains of herpes virus circulating.

Brucella abortus excluded

A Canterbury veterinarian informed MAF of an 18-year-old gelding with a small discharging abscess in the withers region. Serum was submitted to the IDC Wallaceville for testing. *Brucella abortus* was excluded after negative results in the competitive ELISA test. Exotic disease was excluded and the investigation stood down.

Brucella canis ruled out

A veterinarian contacted MAF via the exotic pest and disease hotline after receiving histopathology results from a laboratory regarding tissues from an 11-month-old Bulldog following castration due to testicular swelling. The veterinarian initially believed the swelling was due to testicular torsion, but histopathology of the removed testes identified severe, chronic, suppurative inflammation. Microbial culture was not possible as all tissue had been formalin-fixed. The dog had been born in New Zealand, had not travelled overseas, nor had been mated with bitches that had originated or travelled outside of New Zealand, but the grandparent stock was imported. A blood sample was collected and submitted to the IDC Wallaceville. *Brucella canis* was ruled out after the *B. canis* card agglutination test was negative, and the investigation was stood down.

Ehrlichia canis ruled out

A dog intended for export to Australia tested positive for *Ehrlichia canis* in the IFAT at 1:40. The dog had been rescued, so its prior history could not be determined with complete confidence although available records indicated it was likely to have been born in New Zealand. The IFAT was repeated and remained positive at the same titre. Results of a PCR to determine whether the animal was actively infected were negative, and haematology and biochemistry analysis did not indicate the presence of disease. Animals with an *E. canis* titre may be imported to New Zealand provided they have undergone antibiotic treatment, as the tick vector for *E. canis* is not present here; however, animals that have been exposed tend to have persistent high titres. A repeat IFAT after six weeks was also positive at a titre of 1:40. Subsequently the specimen was referred to the Australian Animal Health Laboratory, where it was found to be negative at a titre of 1:20 using the Australian IFAT. The cause of the false positive is unknown, but there could have been a specific

cross-reaction to a component of the New Zealand test, or it is possible that the Australian and New Zealand IFATs differ in sensitivity.

During routine pre-export testing carried out at the IDC Wallaceville, a three-year-old female Australian cattle dog originally from Singapore tested positive for *Ehrlichia canis* antibodies at a dilution of < 1:2500 by IFAT. The dog was clinically normal and free from external parasites. Prior to entering New Zealand in November 2010 the dog had been treated for an *Erhlichia* infection. Active *E. canis* was ruled out following a negative PCR test and normal haematology. The positive antibody titre is more likely to reflect historic exposure, not a current infection.

Neurological disease in puppies investigated

A veterinary pathologist called the MAF exotic pest and disease hotline to report that he could not exclude a transmissible spongiform encephalopathy (TSE) in several puppies, based on histological findings in the brain. Neurological signs, including ataxia, had started at age three and a half weeks in two unweaned Staffordshire-cross puppies from a litter of five. The affected puppies were euthanased at age six weeks and neurological material was collected. The slides were reviewed by a neurologist/neuropathologist based at the Institute of Veterinary, Animal and Biomedical Sciences at Massey University. Histologically there was neuronal vacuolation and spongiosis (marked, chronic and diffuse) in the spinal cord, and spongiosis in the midbrain (mild, chronic). Similar lesions have been reported in Rottweiler pups and more recently in boxer pups (Geiger *et al.*, 2009). There are no reports in the literature of TSEs occurring in dogs. It is likely that the syndrome reported for this case and those reported in the literature, is inherited.

Exotic ticks excluded

A quarantine officer called the MAF exotic pest and disease hotline to report a finding of multiple live ticks on a dog recently imported from the Netherlands. Standard quarantine procedures were followed, including full treatment of the animal and environment to ensure elimination of ticks. At no time was the dog clinically ill. The ticks were identified as *Ixodes ricinus*. The dog was tested for organisms of the genera *Babesia, Anaplasma, Borrelia, Ehrlichia,* and *Theileria,* because rickettsial diseases are both present and prevalent in the Netherlands. PCR tests and/or an IFAT were performed, as appropriate, to rule out these exotic diseases. After all tests proved negative, all of the above exotic diseases had been ruled out, and the full quarantine period had been completed, the dog was verified free of ticks and released.

A border officer at Auckland International Airport called the MAF exotic pest and disease hotline regarding a dead tick confiscated from a returning New Zealand resident after a trip to mainland China via Hong Kong. The tick had been surgically removed in Hong Kong and the person was attempting to bring it into NZ. The tick was identified as *Dermacentor nuttalli*. It had been acquired in urban Beijing, where it was likely to have been feeding on small mammals such as rats and mice. *D. nuttalli* is a competent vector for certain rickettsial diseases that affect humans, and the tourist was informed of this risk once the tick was identified. The person was in contact with their physician about the tick bite and the regional Medical Officer of Health was notified. The person inspected and cleaned all luggage and clothing as an extra precaution. The investigation was stood down and further testing or treatment will be managed by the primary physician and the Medical Officer of Health.

Feline heartworm excluded

A veterinary pathologist called the exotic pest and disease hotline after analysing a sample from an imported cat. This cat had been presented to a private veterinarian three days after its arrival from Queensland, Australia, with dyspnoea and depression. Fluid was found to be accumulating within the chest cavity, and a sample was removed and submitted for analysis. This analysis confirmed the presence of high numbers of eosinophils, which can be an indicator of parasitic disease, and in this case infestation with the exotic parasite *Dirofilaria immitis* (heartworm) could not be ruled out. Serum and whole blood samples were submitted for ELISA and Knott's testing respectively. Both tests were negative for *D. immitis*. Lung biopsies were collected by the consulting veterinarian. Examination of these biopsies by a veterinary pathologist yielded a diagnosis of bronchial carcinoma. The investigation was stood down following the identification of a neoplastic aetiology and the exclusion of exotic disease.

Feline respiratory disease investigated

A Gribbles veterinary pathologist contacted the MAF exotic pest and disease hotline to report that two veterinary practices in the Auckland area had submitted specimens over the previous two days from a number of cats with a history of unusually severe feline calicivirus infection. Animals were presenting with severe oral ulceration, rostral facial oedema, inappetance and lethargy. Affected kittens had a history of vaccination (although at one practice vaccination had occurred only just before the signs were observed). One submitter had raised concerns about virulent systemic calicivirus. Case reports from the USA and UK of virulent systemic calicivirus in cats describe a vasculitis or haemorrhagic-fever-like presentation (jaundice, alopecia, pyoderma, ulcerative skin lesions on the head and limbs, high mortality rate), which was not seen in these cases. This condition arises from mutations of the virus, which vary between outbreaks. Hence it is possible that a New Zealand mutation could produce a different presentation. Further investigation was initiated to explore this possibility.

One practice had only one case, a 14-week-old male entire Persian kitten, which had been twice vaccinated with live-attenuated vaccine. It presented with salivation and ulceration of the rostral third of the tongue. Toxin exposure was initially suspected, but after six days the upper lip and nasal planum were also affected, and the animal showed some mild ocular discharge. Pyrexia was not noted, and other cats in the household (including one other kitten of similar age) remained healthy. The animal was euthanased when its condition continued to deteriorate. At necropsy the tongue had extensive ulceration underneath as well as on the palatine surface. Histopathology of the lip showed focal necrosis of squamous epithelial cells in the mucosa, with dense infiltrates of mononuclear inflammatory cells and neutrophils, and locally extensive ulceration of the mucosa. Occasional cells showed intra-nuclear inclusion bodies. No other tissues showed lesions of note. The pathologist's opinion was that the ulceration was viral in origin and that herpesvirus was possibly involved owing to the presence of intra-nuclear inclusions.

The second practice, which was associated with an animal shelter, saw at least 50 cases. The first two cases showed severe ulceration of the margins, ventral and rostral parts of the tongue, lips and nasal planum, along with facial swelling. Earlier cases were seen in kittens under three months of age, but some adults were later affected. Most of the affected animals had been in the shelter less than a week and may not have been well protected by vaccination, although all had been vaccinated on arrival. Two seven-week-old kittens were necropsied. Both showed sublingual ulceration of the mucosa of the rostral tongue, with the mucosa fragile and easily detached. Histopathologically the tongues showed vesicles in both the dorsal and ventral mucosa, with ulceration and marked densely cellular locally extensive infiltrates of polymorph neutrophils and macrophages in the submucosa and glossal muscles, with locally extensive myositis and necrosis. One animal also showed thrombosis of blood vessels and infarction of the tip of the tongue. No other significant lesions were noted.

Specimens from all three animals were submitted for PCR and virus isolation, and both tests confirmed the presence of both feline herpesvirus and feline calicivirus. It is possible that co-infection with both viruses had a synergistic effect, thus causing worse pathology than usually seen, or that young age and stress caused immune depression, rendering the kittens more vulnerable. There was no evidence to suggest a viral mutation causing a haemorrhagic-fever-like syndrome as has occasionally been reported overseas.

Avian mortality events investigated

An AsureQuality veterinarian for a poultry Transitional Facility called the MAF exotic pest and disease hotline to report neurological signs and death in about 20 six-day-old Hyline Brown pullets. The affected birds were from a pen of 558 chicks. A further eight died over the next 24 hours, after which there were no more deaths. Post-mortem examinations were carried out on six freshly dead chicks and a range of tissues collected. There were no significant findings on gross pathology. The main histopathological observations were of large numbers of gram-positive cocci in all tissues. Brain, liver and intestine were negative on PCR for avian influenza, exotic avian paramyxovirus-1 (Newcastle disease), infectious bursal disease and adenovirus. The organisms cultured from several tissues, including brain, were *Enterococcus hirae* and *E. faecium*. These organisms are both commonly associated with septicaemia and low-mortality events in young chicks, and are not new or exotic to New Zealand. The investigation was stood down.

A duck rehabilitator called the MAF exotic pest and disease hotline to report unusual numbers of dead mallard ducks (*Anas platyrhynchos*) in the stream flowing through his property. Between 200 and 300 wild or semi-wild ducks may be congregated at a time on the caller's property, where sick, injured or orphaned ducks from around the Wellington region are collected and rehabilitated. The wild population also receives supplementary feeding. The caller reported that usually only one or two dead birds were found on the property every three months. The day before the call, three dead mallard ducks were found in the stream. They were adults in good physical condition and showed no external signs of injury. Twelve more in a similar condition were found the next morning, prompting the notification. One more dead bird was found on each of the two following days.

There were no adverse climatic events, pest-control programmes in progress, or reports of deaths to the Greater Wellington Regional Council, DOC, or from other properties upstream or downstream. No sick ducks were noticed on the property (apart from rehabilitation cases, which were injured, not infected animals), and no other sick or dead birds or animals were found. The stream was fast-flowing at the time of notification, owing to rain, so it is possible that the dead ducks had died elsewhere and been washed to this location, or that more had died on this site but had been washed away. Six freshly dead ducks were necropsied. Some had increased pericardial fluid, increased peritoneal fluid, and small haemorrhages 1–2 mm across, either in the fat of the cardiac groove or extending across the surface of the ventricles and atria (and in one case, extending into the muscle). One bird also had subcutaneous gelatinous oedema over the breast muscle. There was no evidence of grain or pellets that might have indicated an intentional poisoning, and no evidence of trauma.

Specimens were collected for exclusion of exotic or emerging types of avian influenza and avian paramyxovirus 1, and for bacterial culture and histopathology. Avian influenza PCR (including H5/H7-specific PCR) was negative in all birds. One bird was positive for avian paramyxovirus-1 by PCR on an intestinal sample, but as its other tissues tested negative this is likely to indicate carrier status involving the endemic APMV-1 strain. Bacteriological culture yielded heavy mixed growth, but was negative for *Salmonella*, *Escherichia* and *Pasteurella* spp. Histopathology of six birds showed generalised congestion in many tissues, with variable haemorrhage and splenic lympholysis (likely due to stress), but no evidence of infectious or inflammatory processes. In several birds, histology revealed large amounts of mucus streaming from the mucus glands lining the oesophagus and trachea, and mucus was also noticed in the oral cavity and proventriculus. In the absence of infectious or inflammatory processes, a toxic cause of the deaths was considered likely, and the mucus seen at histopathology suggested that organophosphate was a possible agent. The deaths were confined to a short period, suggesting a single or short-term point-exposure to the cause, and this further suggested of a toxic cause. The investigation was stood down because no exotic or emerging cause of disease was detected, and the deaths had ceased.

Exotic *Pasteurella multocida* excluded

A Gribbles veterinary pathologist called the exotic pest and disease hotline to report *Pasteurella multocida* in poultry. The poultry operation raised chickens and gamebirds for public sale, and the owner had noticed several pheasants from a pen of 20 with respiratory signs (sneezing and wheezing). A bird was sacrificed for post-mortem and taken to the regular veterinarian. Histopathology revealed chronic multifocal granulomatous sinusitis, airsaculitis and cellulitis. *P. multocida* was cultured from tissues and subsequently typed by PCR as capsular type A. This strain is endemic and common in New Zealand poultry. All clinical signs in affected pheasants resolved with antibiotic treatment, and the investigation was stood down.

Avian influenza and Newcastle disease ruled out

A pathologist from New Zealand Veterinary Pathology called the MAF exotic pest and disease hotline after carrying out a post-mortem examination on a duck from a small backyard flock in which seven of 20 had died over the previous ten days. The duck was in good body condition but had lung congestion and a marginally enlarged spleen. Fresh tissues were submitted to the IDC Wallaceville for exclusion of exotic diseases. Molecular assays excluded the involvement of avian influenza and avian paramyxovirus type 1 viruses. Bacterial culture identified a *Salmonella* species in liver and intestinal samples, and this was serotyped at the National Enteric Reference Laboratory (Environmental Science and

Research – Wallaceville) as *S.* Typhimurium. There was histological evidence of a cardiomyopathy, with subacute myocardial fibrosis and mild mineralisation of myofibres consistent with monensin or possibly milkweed (*Asclepias* spp.) poisoning. No significant abnormalities were identified in any other organ systems. No ionophores had been added to the commercial diets in use at the time, but a fruiting milkweed plant was present in abundance. The cardiac disease was presumed to be the primary condition affecting the ducks, with *Salmonella* present as a secondary complication. Exotic diseases were excluded and the investigation stood down.

Exotic honeybees excluded

A quarantine inspector called the MAF exotic pest and disease hotline to report a bee swarm on a shipping container recently arrived from Australia. The swarm had not been noticed during unloading 10 days previously. Bee activity was first noticed seven days after the container arrived, and the inspector considered it unlikely that the bees would have been on it since before its arrival. Nonetheless the swarm was treated as potentially exotic, and an AsureQuality Apiary Advisory Officer dispatched an authorised beekeeper to contain and kill the swarm. It was noted that the bees were infested with varroa, making it very unlikely they had come with the shipping container, as Australia is free from varroa. Specimens were submitted to the Animal Health Laboratory and the Plant Health and Environment Laboratory at Tamaki for exclusion of exotic diseases and mites. No exotic agents were detected.

Exotic honeybee mite excluded

An AsureQuality Apiary Officer notified the IDC Wallaceville of mites found in a bee colony that he could not identify. A sample of bees and mites was examined by an entomologist at the IDC Tamaki. A large number of pollen mites (*Neocypholaelaps novaehollandiae*) were identified in the sample. No tracheal mites were found from tracheal examination of bees.

Israeli acute paralysis virus ruled out

On 14 March 2011 a National Beekeeper Association liaison from the Ashburton area called the MAF exotic pest and disease hotline regarding the concerns of three commercial beekeepers, who had found similar mortality, morbidity and clinical signs in their apiaries. The beekeepers reported large numbers of dead bees (both young and mature) in front of their hives. The beekeepers did not discount pesticide spray drift as a contributing factor, but were concerned about exotic diseases as the bees appeared to be exhibiting neurological signs and were jumping and showing spastic movements. There were no signs of starvation or colony collapse and there was no sign of disease in the brood. PCR testing for Israeli acute paralysis virus (IAPV), deformed wing virus (DWV), and Kashmir bee virus (KBV) was undertaken to rule out exotic viruses and to determine a likely cause of the deaths and clinical signs. Pesticide testing was also undertaken at the AsureQuality pesticide residue laboratory in Lower Hutt.

There were a significant number of positive samples for DWV and KBV (which are endemic in New Zealand) but all were negative for IAPV (which is exotic). Pesticide testing on both affected and unaffected bees did not reveal any pesticide residues. It is likely that DWV and KBV were present in the hives, potentially spread by a vector such as varroa, and that some additional stress resulted in the mass mortality event seen by the beekeepers. The investigation was stood down as the likely exotic disease had been ruled out.

Nosema ceranae confirmed

A commercial beekeeper called the MAF exotic pest and disease hotline when he discovered that 28 of 52 hives at five apiaries on the Coromandel Peninsula were empty. The hives had been healthy and strong in autumn, and he was concerned that they had been abandoned and the remaining hives were weak when he inspected them for the first time after winter. Other apiaries managed by the same beekeeper nearby were unaffected, and no problems had been reported from other hives in the district. The beekeeper had recently changed his varroa management programme. Given that a warmer-than-usual winter had enabled improved brood survival, increased varroa pressure was considered a likely contributing factor. Other possible factors were the use nearby of imidacloprid-treated grass seed, and the use of a spray containing surfactant on nearby gorse bushes. Samples of bees were collected from each affected apiary and examined at the MAF Plant Health and Environment Laboratory for the presence of *Tropilaelaps*, *Acarapis* and *Varroa* mites, and at the MAF Animal Health Laboratory for Israeli acute paralysis virus, *Nosema apis* and *N. ceranae*. Samples from all affected apiaries were negative for exotic mites,

although a heavy burden of established species (including *Varroa destructor*) was present. Four apiaries out of seven were positive for *N. ceranae* following PCR and confirmatory sequencing, and all seven were positive for *N. apis*. *N. ceranae* has not previously been detected in New Zealand, and a biosecurity response was initiated.

Southern saltmarsh mosquito ruled out

A member of the public contacted the IDC Wallaceville to report day-biting mosquitoes on Kawau Island. The caller was concerned that they might be southern saltmarsh mosquitoes, *Aedes camptorhynchus*, which have been eradicated from New Zealand. A specimen was collected and submitted to the IDC Tamaki where it was identified as *Aedes notoscriptus* (Diptera: Culicidae), a species known to be present in New Zealand. No further action was required with respect to this detection.

Risk goods investigated

A member of the public called the MAF exotic pest and disease hotline to report what appeared to be a bone inside a plastic toy car her son had won at the Easter Show. The toy was labelled as having been made in China, but no further details were provided on the packaging and the caller could not name the stall from which the item had been obtained. The car was submitted to MAF and determined indeed to contain a bone but it was not associated with any other organic material to indicate when it might have become incorporated in the toy. The supplier of the car could not be traced. The bone, toy and packaging were disposed of securely.

A member of the public called the exotic pest and disease hotline to report that they had received from India a greeting card decorated with painted eggshells. The card was submitted for examination and the material was positively identified as eggshell by an expert at the Museum of New Zealand Te Papa Tongarewa. The card had been sent from a charity in India to its supporters in New Zealand. The charity was able to confirm that the eggs had been boiled before the shells were removed, painted and fixed to the cards. The risk of introduction of an exotic disease by this route was estimated as insignificant.

A MAF staff member reported that a Japanese product declared to contain only vegetables in fact contained beef. The product had been declared as prepared potato paste, rather than beef croquette. There is no import health standard for beef products from Japan. The food retailer was visited and the remaining product seized and destroyed. The risk that this product posed is likely to have been extremely low as the meat in it was cooked and had been originally sourced from Australia. Also, the quantity of product imported (8 kg) and the proportion of meat in it was relatively small.

Dumplings suspected of containing pork from Korea were discovered during a routine inspection by MAF Border Operations in an Asian food store in Christchurch, where they were stored for sale in a freezer labelled as containing pork products. An investigation was initiated. Visits to another four stores belonging to the same company the following day resulted in finds of the same dumplings in all stores, all kept in freezers which again were labelled as containing pork products. All the dumplings were placed on hold pending investigation into their ingredients, as were the remaining supplies at the local importer's premises. However, it was noted that the English-language ingredients list on the packaging, and the product information sourced from the importer, did not include any meat. Since this was not consistent with the implication, from the product placement in-store, that the dumplings contained pork, a translation was made of the Korean-language ingredients list on the packaging. This agreed with the English version, and so the goods were released for sale.

A member of the public called the MAF exotic pest and disease hotline to report that he had received a package in the mail that smelled of decayed fish. The parcel had been received in error as it was wrongly addressed. The property was visited and the source of the odour determined to be a packet of kimchi (fermented fish, vegetables and seasonings). The food was destroyed and the remaining contents, consisting of items of clothing, were delivered to the correct address. The owner of the parcel was advised to tell the Korean source of the parcel that food could not be sent via post.

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