

Quarterly review of diagnostic cases – April to June 2000

LABNET Invermay Ltd

Cattle

Neosporosis was the most common diagnosis in cattle abortion cases this quarter. In one typical case, a cow aborted at 5 to 6 months' gestation, and histology of placenta and foetal brain, heart and skeletal muscle revealed lesions consistent with *Neospora* abortion.

Selenium deficiency appeared to be relatively common this quarter. In most cases, the main clinical sign was ill thrift. White muscle disease is not commonly recorded at the laboratory, but in a recent case, exercise may have induced the condition in selenium-deficient calves. A group of 8-month-old Highland calves was driven a long distance and two died. A few days later the group was moved another 2 km and one collapsed. Its serum CK concentration was > 30,000 u/l (10-200 u/l normal), indicating severe rhabdomyolysis, and its blood GSHPx concentration was 0.4 u/l (2-100 u/l adequate), suggesting an underlying selenium deficiency.

In a group of 8-month-old calves, which had been on choumoellier for a week, four died in a 2-day period. Two others became dull, but they showed agitation when approached and had hypermetria. A practitioner necropsy showed marked pulmonary oedema and emphysema, and there was marked autofluorescence in the brain under ultraviolet light. A diagnosis of **polioencephalomalacia** was confirmed histologically.

Ruminal acidosis was diagnosed by rumen histology and/or rumen pH assay in several cases involving cattle that had been moved from pasture onto swedes. In one case in cows, the condition developed in spite of the farmer taking steps to prevent problems by feeding hay in the morning before putting the cows on the swede break in the afternoon.

A contractor had laid 1080 poison in an area grazed by a group of 16-month-old Hereford heifers. Several died, and necropsies were carried out 6 to 7 days later. Rumen contents from one were submitted for 1080 tests, and in spite of autolysis this showed 0.70 mg/kg, confirming **1080 toxicity**.

Sheep

As well as several cases of cerebral listeriosis, a significant number of cases of **enteric listeriosis** were recorded this quarter. These were characterised by sudden deaths, or diarrhoea and deaths in ewes. *Listeria monocytogenes* was isolated from enteric tissues in all cases. In one case, necropsy of a ewe showed a decomposing foetus *in utero* and *L. monocytogenes* was isolated from foetal tissues as well as from ewe intestine. Signs of enteric listeriosis often began 2 to 3 days after feeding poor quality baleage or silage.

Seven outbreaks of **Salmonella Hindmarsh** infection and one of

Each quarter, *Surveillance* publishes a review of selected diagnostic cases handled by New Zealand's veterinary diagnostic laboratories. These cases do not necessarily reflect our national disease profile but they do represent diseases of particular importance to our livestock industry.

S Typhimurium were recorded, usually with a history of dullness and diarrhoea with deaths in ewes, and necropsies showed gastroenteritis.

In two cases, ewes were found dead or in lateral recumbency with hyperaesthesia. Histology revealed lesions of **polioencephalomalacia**. This condition can be associated with high sulphur intake.

Ruminal acidosis was recorded in several cases in ewes on crops. In a typical case, young ewes that had been on turnips for 4 days were not eating. One was recumbent with rumen stasis, and it died in spite of bicarbonate treatment. Histology showed multifocal acute suppurative rumenitis confirming the diagnosis.

A group of rising 2-year-old ewes were in poor body condition and the worst had swollen jaws. Two heads were submitted for examination and in both there were **dentigerous cysts** 1 to 2 cm diameter around the erupting permanent central incisors. Dentigerous cysts are often the result of infection of the capsule around the developing incisor, and in some cases it is thought that infection tracks from the root of the overlying temporary incisor. Feeding on root crops may predispose to the condition.

Pigs

A 4-month-old large white pig died, and necropsy showed excess peritoneal fluid with fibrin clots, excess pleural and pericardial fluid and an enlarged liver. Grossly, there appeared to be a severe cardiomyopathy, and this was confirmed on histology, which showed mineralisation, fibrosis and haemorrhage typical of **mulberry heart disease**, with secondary hepatic centrilobular necrosis. MHD can be produced by feeding diets low in vitamin E and selenium, or as a result of reduced bioavailability of vitamin E in diets containing large amounts of unsaturated fat.

Deer

Several outbreaks of **enteric yersiniosis** occurred in 6 to 8-month-old deer. Clinical signs included watery diarrhoea, dysentery and deaths. Two histories described concurrent lungworm infections, and in one outbreak the deer had been vaccinated 5 weeks beforehand. Diagnosis was based on culture of *Yersinia pseudotuberculosis* from intestinal samples. Sometimes there was a history of predisposing stress, as in a case in which the weather had been wet and cold, and the deer were pressured (unsuccessfully) to eat turnip bulbs. At least six deer died.

Polioencephalomalacia occurred occasionally in recently weaned deer, usually after a sudden change of diet or move to brassica feeding. The deer became blind and developed neurological signs. There were no gross abnormalities, but histology revealed laminar cerebral cortical malacia typical of polioencephalomalacia. One unusually large outbreak occurred in a group of 150 rising 2-year-old stags after treatment with pour-on anthelmintic, yarding overnight with *ad lib.* water, onions and pea straw, then transportation. At unloading, one stag showed neurological signs and over the next few days at least 12 developed signs including blindness, circling and hyperaesthesia, and six died. Transportation, the feeding of onions and a sudden diet change may have contributed to the production of increased numbers of thiaminase-producing bacteria in the rumen.

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LabWorks Ltd

Cattle

A rising 2-year-old Friesian cattle-beast died suddenly with massive subcutaneous haemorrhage and oedema, especially round its head and neck. There was subcutaneous gas formation suggestive of clostridial disease, and *Clostridium sordellii* was isolated from a muscle sample.

Sheep

On a sheep farm each year for the last 5 years, several young Borderdale ewes have developed a progressive neurologic disease from about 15 months of age. Affected sheep became difficult to shift through gateways, and wandered aimlessly and apparently blind. There was no response to thiamine and penicillin injections. Three affected sheep were euthanased, and grossly there was extreme atrophy of the cerebral cortex with slight dilation of the lateral ventricles. Histopathology revealed lysosomal storage disease with neurones throughout the brain containing globules of eosinophilic pigment. On referral to Dr David Palmer of Lincoln University, this was shown by immunohistochemical staining and UV microscopy to be ceroid-lipofuscin. **Ceroid lipofuscinosis** has previously been recorded in Hampshire sheep in New Zealand.

Deer

Cases of **mycobacterial enteritis** continue to occur in young deer stags. In a recent case, a 2-year-old red deer stag died suddenly. At post-mortem, it had no body fat, the mesenteric lymph nodes were enlarged and the lower intestinal tract was thickened. Microscopically, the pathology was typical of the granulomatous mycobacterial enteritis of Johne's disease or *Mycobacterium avium* infection. Similar findings were obtained in another case in which six 9-month-old red deer stags showed chronic wasting and scouring.

Horse

Two 2-year-old Clydesdale mares were scouring, and faecal samples were submitted for bacterial culture and parasite examination. No significant bacteria were isolated, and the parasitological examinations were negative for *Parascaris* and *Strongyloides* eggs. However one mare had 50 strongyle eggs per gram of faeces and **cyathostome** larvae were present in both samples. Cyathostomes consist of a group of over 40 species of small strongyles, and frequently make up the major worm burden of adult horses. The clinical effects of these parasites range from poor body condition to fatal diarrhoea.

Alpaca

An alpaca developed signs of respiratory disease and it died. At necropsy, the lungs contained pale consolidated areas, and 90% of one lung was affected. Microscopically there was widespread granulomatous and necrotising pneumonia, and ZN stains demonstrated massive numbers of acid fast organisms, confirming mycobacterial pneumonia. *Mycobacterium bovis* was isolated. This is the first case of alpaca tuberculosis identified in New Zealand.

Poultry

Fixed liver samples were submitted from birds from a poultry farm where there was a problem with low live-weights and poor feed conversions. Histological examination revealed bile duct proliferation in a **hepatopathy** suggestive of mycotoxic damage, possibly aflatoxicosis.

Cat

A 5-year-old cat had an exuberant vegetative growth between the pads of one foot. Microscopically, there was a very marked proliferative dermatitis with thickening and ballooning degeneration of the epidermal cells. Viral inclusion bodies within these ballooned cells suggested a **poxvirus infection**, and this was confirmed by electron microscopy. This is the first time this disease has been diagnosed in cats in New Zealand, although the disease has been recognised in cats in the UK. Cats are thought to become infected while hunting. Cat-to-cat transmission can occur, and the condition is a zoonosis.

Other species

Three recently captured **wallabies** died and another was unable to support its weight on its hind legs. Pathology examinations revealed widespread myonecrosis of the skeletal muscles of the hind legs. The liver selenium concentration was adequate at 300 nmol/kg, but the liver vitamin E concentration was very low (<0.11 iu/100gm) suggesting that the **skeletal myopathy** was caused by low vitamin E status.

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Alpha Scientific Ltd

Cattle

A scouring cow lost weight rapidly and aborted. Histological examination of the placenta was unrewarding, but culture of faeces yielded *Salmonella Anatum*.

Eighty beef heifers were transported by road for several hours. At unloading, one was noted to be lethargic and depressed, it deteriorated and died. No significant necropsy findings were reported but histological examination of the intestines revealed massive inflammation and parasitic infection by **coccidial organisms**. A blood ELISA for BVD antigen was negative.

Necropsy of an aborted bovine foetus showed an increased amount of clear transudate in the peritoneal cavity, and histological examination revealed extensive mineralisation of the cardiac myofibres. These findings are consistent with **selenium/vitamin E deficiency**. Although blood and tissue concentrations of selenium and vitamin E were not tested, the farmer had this season discontinued his usual practice of providing the cows with selenium supplements.

Several cases of **zinc toxicity** were recorded over the autumn period. One of these involved dry cows being supplemented with zinc at the maximum dose rate in one daily dose. Milking cows in the herd received half the dose twice daily. The dry cows had haematuria, some had haemolytic anaemia and all had low serum amylase concentrations. The mean of seven serum zinc concentrations was elevated at 235 $\mu\text{mol/l}$ (normal 9-20 $\mu\text{mol/l}$). Other cases included dairy cows being fed inadequately mixed feed and supplement, and a group of calves which were given zinc boluses in spite of being less than the recommended weight.

Sheep

Six-month-old lambs were scouring and dying. Histology revealed small intestinal villous atrophy and lesions of acute, necrotising hepatitis in which there were bacteria. *Listeria ivanovii* was isolated from fresh liver samples.

Routine pregnancy scanning revealed that several 18-month-old ewes had pyometra, degenerate foeti and cotyledonary regression. Culture of uterine contents yielded a heavy growth of *Acanobacterium pyogenes*.

Pigs

An investigation of poor growth rates and respiratory disease in a group of pigs revealed that many had lymphoid cuffs about the bronchioles and extensive bronchointerstitial pneumonia. Although cultures were not carried out, the probable cause was *Mycoplasma* infection. This condition, **enzootic pneumonia**, is a recognised cause of poor growth rates in pigs. It is commonly detected at *post mortem* inspection of the lungs.

Dogs

From the faeces of a 9-week-old Staffordshire bull terrier with

diarrhoea, both *Salmonella Typhimurium* and *Campylobacter jejuni* were cultured.

A 9-year-old female Staffordshire bull terrier developed forelimb lameness and radiographs showed changes consistent with hypertrophic osteopathy. Further radiographs of the chest revealed pulmonary consolidation and pleural effusion. Cytology of the pleural fluid and lung aspirates confirmed pulmonary carcinoma. These findings are consistent with hypertrophic pulmonary osteopathy, also known as **Marie Bamberger's disease**.

Cats

A 12-year-old cat had cachexia and marked exfoliating dermatitis. Large numbers of lice were found and these were identified as *Felicola subrostratus*. This parasite was first reported in New Zealand in 1956 but is rarely seen. It is usually found on debilitated cats such as this one, and it causes extreme pruritis.

Avian

A likely new species of avian *Babesia* was found during routine health monitoring of a North Island Brown kiwi. Ticks, which are common on kiwis, are thought to be the vector. Also found was a likely new species of *Hepatozoon*.

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AgriQuality Laboratory Network

Cattle

Approximately six cows in a dairy herd presented with multiple hyperkeratotic teat lesions. Two of these lesions were removed for histological evaluation. Grossly the lesions appeared as raised hyperkeratotic poxlike lesions. A diagnosis of **pseudocowpox** was made based on the presence of numerous large intracytoplasmic inclusions compatible with those of a parapoxvirus.

Blood samples were received from two Angus cows of unknown age. They were losing weight, had bottle-jaw and a chronic scour. Serum pepsinogen concentrations were normal and they were negative to the Johne's ELISA test. The serum GGT concentration was normal in one animal at 12 u/l, and mildly increased in the other animal at 228 u/l. (reference range: 8-36 u/l). The liver fluke ELISA test gave a high positive result in both animals confirming **liver fluke infection**.

Sheep

A sheep developed clonic-tonic convulsions when disturbed. There was no improvement following therapy with a vitamin B1 preparation and the sheep died. Several tissues including the brain were examined histologically. In the brain, particularly in the medulla and midbrain, there was a subacute to chronic purulent meningoencephalitis consistent with **cerebral listeriosis**.

Salmonellosis was diagnosed in many cases, usually in mixed age

ewes in good condition that developed severe diarrhoea and died. In one case, sudden deaths were noted, and after *Salmonella* vaccination 20 or more ewes died. *Salmonella Hindmarsh* was cultured from intestinal contents. One outbreak was recorded in a group of 55 Texel ram lambs that were unthrifty, 20 were clinically ill and four had died. They had been drenched several times with various anthelmintic formulations, but most had pale green diarrhoea. In another case, *S Typhimurium* was cultured from lymph node and small intestinal contents from a dead lamb and histological examination of small intestine revealed lesions consistent with the diagnosis of enteric salmonellosis.

A month after drenching, four young Finn cross sheep died and 200 were unthrifty in a flock of 2000. The sheep were well grown but weak and dull, with watery diarrhoea. Intestinal tracts were collected from two euthanased animals. Trichostrongyle counts were 28,800 and 76,000. These are **heavy nematode burdens** and the probable cause of the ill thrift. *Salmonella* and *Yersinia* cultures of intestinal content were negative.

Fifty of 200 ram lambs were found dead. They had been grazing a newly sown annual ryegrass pasture. A test of an aqueous humour sample for nitrate was positive, confirming a diagnosis of **nitrate poisoning**.

Deer

One young deer was found dead. Two more deer, which were thought to be by the same sire, developed neurological signs and one was euthanased. The brain was submitted for histological examination, and this revealed lesions in the cerebellar folia like those described for **cerebellar abiotrophy** of cattle.

Two 1-year old stags died overnight. One had been bloated the previous day and showing signs of pain. At necropsy, both had severe haemorrhagic enteritis, and the abomasal wall of one was necrotic and the abomasum filled with brown fluid. On histology, severe transmural congestion and scattered haemorrhages were seen in bowel sections, there were multiple foci of necrosis of the mucosa and there were abundant gram positive bacilli morphologically consistent with *Clostridium* species. Cultures for *Salmonella* and *Yersinia* species were negative. Anaerobic cultures yielded *Clostridium perfringens*, and the lesions were consistent with **clostridial enteritis**.

On several farms throughout the North Island this winter, sudden deaths occurred in newly weaned deer about 6 to 8 weeks after weaning. At necropsy, red urine was noted in some carcasses, and laboratory examinations indicated that **leptospirosis** was the cause of death. In cases where serology was carried out, significant titres against *Leptospira pomona* were detected. The occurrence of the disease may be related to the build up of infection and waning of maternal immunity. One particularly severe outbreak occurred about a month after weaning in a group of 176 elk of which 25 died. Histological examination of one, which had had diarrhoea and was emaciated, revealed kidney and liver lesions consistent with

leptospirosis, and silver stains demonstrated the presence of large numbers of leptospire in renal tubules.

Ten recently weaned deer, which had been fed poor quality silage in early winter, were found dead or *in extremis* over a period of 4 weeks. Two stags were found circling with nystagmus and opisthotonos, before becoming recumbent. One was euthanased and one died. Within the brainstem of both stags were lesions of meningoencephalitis with multifocal microabscesses consistent with a diagnosis of **cerebral listeriosis**, and within lesions there were small numbers of short gram-positive bacilli resembling *Listeria* species.

Pigs

Serpulina species were isolated from two groups of pigs with diarrhoea. *S pilosicola* was isolated from faecal samples from three piglets in a group of grower pigs, and *S innocens* was cultured from a faecal sample from a 6-month-old large white/Landrace pig. Some research workers regard *S innocens* as a less virulent strain of *S hyodysenteriae*.

Poultry

Sixty deaths occurred over 3 to 4 days in a flock of 75,000 poultry. Three dead birds and two live birds with respiratory signs were submitted for necropsy. The most significant finding was a diphtheritic membrane in the larynx. Histology revealed a range of necrotising and inflammatory lesions in the respiratory tract including acute laryngotracheitis. Although no intranuclear inclusions or syncytial cells were noted, a herpesvirus was obtained on culture, and confirmation was obtained by electron microscopy. A diagnosis of acute **infectious laryngotracheitis** was made.

Other birds

In a dove submitted for necropsy the only significant gross lesion was moderate hepatomegaly and hepatic congestion. Microscopically, there was severe necrosis and granulomatous inflammation associated with Machiavello-stain positive intracytoplasmic granular basophilic inclusions in the liver, spleen, lung, air sacs and intestine. These lesions are consistent with **fulminant chlamydiosis**.

Dogs

From faecal samples from a 9-year old standardbred poodle with diarrhoea, *Salmonella Singapore* was isolated.

Cats

Faeces were submitted for culture from a 16-year old city cat, which had mucoid diarrhoea and dysentery. There had been no response to treatment. *Salmonella Typhimurium* phage type 160 was isolated. This is the first non human isolate of this phage type in New Zealand. Previous isolates have been from humans in the same city, one in 1998, three in 1999 and four so far this year. No other human or animal in the household was affected and the cat made a full recovery.

Fish

Mycobacterial disease was diagnosed in an adult female fresh water fish. The fish had become disoriented and spent several days floating on its side at the top of the tank. At necropsy, the only significant lesion was moderate diffuse green discolouration of the liver. Microscopically, several organs contained dense infiltrates of cells of inflammation with small foci of caseation containing acid fast bacilli.

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