

## OVERVIEW

- **Delayed swayback in five-month-old lambs**
- **Review of lead poisoning**
- **Acute bracken poisoning in a cow**
- **Nutritional cardiomyopathy in pigs**
- **Avian tuberculosis in an buzzard**

## GENERAL INTRODUCTION

The month was generally unsettled, with strong winds and heavy rain at times. It was mostly mild, with few frosts and the mean temperature for the month was 1.1 °C above the 1981 to 2010 average. Rainfall overall was 141 per cent of average, making it provisionally the equal-third wettest October over Scotland since 1910, and the wettest October for Scotland since 1954. Sunshine amounts were 88 per cent of average overall, but slightly above average for the Western Isles.

### DISEASE ALERTS

The following conditions were reported by SAC C VS disease surveillance centres in February 2014. Given similar climatic and production conditions, they could also be important this year.

- **Fasciolosis in cattle**
- **Infectious bovine rhinotracheitis**
- **Bovine foetopathy due to *Bacillus licheniformis***
- **Pregnancy toxæmia in ewes**
- **Systemic pasteurellosis in finishing lambs**

## CATTLE

### Nutritional and metabolic disorders

Ayr diagnosed frothy bloat in a seven-month-old Charolais-cross heifer that died suddenly in a group of 18 cows with calves at foot. The calves had access to a high protein blend as a creep feed and the cows were being fed 1 kg per day of a barley and beet pulp mix with added magnesium. At postmortem examination the rumen was massively distended with frothy content, the cervical oesophagus was congested and the thoracic oesophagus appeared blanched. SAC C VS commented that this type of bloat is most commonly associated with lush leguminous pastures and clover-rich swards. As these cattle were on bare pasture, it was considered that the creep feed may have contained a high percentage of finely ground grain and SAC C VS recommended that the composition of the creep feed should be assessed.

An increase in hypomagnesaemia cases was noted this month with 19 diagnoses made across Scotland compared with three in October 2013 and eight in October 2012. St Boswells diagnosed hypomagnesaemia as the cause of five deaths in Aberdeen Angus-cross cows. Four animals were found dead and a fifth was found thrashing before death. Vitreous humour (VH) magnesium levels from two cows were 0.51 mmol/l and 0.58 mmol/l (<0.55 mmol/l is considered consistent with hypomagnesaemia). SAC C VS commented that a VH magnesium value within or only marginally below reference range does not rule out hypomagnesaemia as a cause of death, as autolysis, contamination with cells or cellular debris can elevate levels. Three of five serum samples from the cohort also had magnesium levels below reference range.

Inverness diagnosed hypomagnesaemia with concurrent hypocalcaemia and hypophosphatemia in a group of cattle that had been deprived of water overnight. One of the affected animals, which was recumbent, had a serum magnesium level of 0.3 mmol/l (reference range 0.8 to 2.0 mmol/l), calcium level of 1.5 mmol/l (reference range 2.0 to 3.0 mmol/l) and phosphate level of 0.8 mmol/l (reference range 1.0 to 3.0 mmol/l).

### Toxic conditions

Thurso diagnosed acute bracken poisoning in an eight-year-old suckler cow that presented with pronounced haemorrhage in the anterior chamber of the eye. Haematology revealed severe anaemia, leucopaenia and thrombocytopenia. SAC C VS commented that acute bracken poisoning causes bone marrow suppression, while chronic poisoning can result in bladder tumours or, less commonly, squamous cell carcinomas of the oesophagus or rumen.

### Generalised and systemic conditions

Ayr diagnosed salmonellosis in dairy calves that were fed on an automatic calf feeder. Five deaths occurred from a group of 20 calves under one-month-old. Sixteen calves experienced diarrhoea and 10 showed signs of pneumonia. Two animals had also exhibited neurological signs prior to death. Postmortem findings in two calves included early consolidation of the cranial lung lobes, inflammation of the small intestinal mucosa, liquid intestinal contents, enlarged liver and spleen and cloudy meninges. *Salmonella* Dublin was recovered from the viscera of both carcasses.

Dumfries also diagnosed salmonellosis in a nine-week-old Holstein Friesian calf that had melaena for two days before death. At postmortem examination the carcass was dehydrated and jaundiced. The cranial lung lobes were congested, the spleen was enlarged with ecchymotic haemorrhages and the liver was orange-

coloured and friable. *S. Dublin* was recovered in systemic distribution.

### Reproductive tract conditions

Perth diagnosed a ruptured bladder in a three-month-old Limousin-cross bull calf that died suddenly. At postmortem examination the bladder had ruptured near the left ureter and uroabdomen was present. A 4 cm-sized blood clot was found 5 cm from the end of the penis. SAC C VS considered that this blood clot, likely a result of trauma, resulted in constriction of the lumen of the urethra and subsequent bladder rupture. Histologically both ureters had chronic inflammation with mineralisation and one was partially obstructed by loose fibrosis. SAC C VS commented that this chronic damage, possibly from ascending infection, likely predisposed to the rupture occurring at this location.

### Nervous system disorders

Inverness diagnosed louping ill in a Simmental-cross cow that was recumbent with a head tilt and pyrexia. Antibody to louping ill virus was detected, with evidence of immunoglobulin M (IgM) predominance supportive of recent infection. The serum magnesium value was also considered marginal at 0.7 mmol/l (reference range 0.8 to 2.0 mmol/l). This case occurred in Moray and SAC C VS commented that louping ill is frequently diagnosed in sheep in this area. Sheep are commonly vaccinated against the disease and receive acaricidal treatment, but cattle are not commonly affected.

## SMALL RUMINANTS

### Nutritional and metabolic disorders

Inverness diagnosed delayed swayback in two five-month-old Cheviot-blackface-cross lambs. The flock had reported an increasing incidence of lambs with hind limb paresis over the previous three years and copper deficiency had been confirmed earlier in 2014. The lambs were alert, but tended to twitch their heads and relied mainly on their forelimbs for mobility. They were apparently clinically normal until shortly before examination. Neuropathology revealed vacuolation of the white matter, chromatolytic neurons in the brain stem and severe vacuolation in the spinal cord. These changes are consistent with delayed swayback. Liver copper levels were low in both cases (172 and 159 µmol/kg DM; reference range 314 to 7850 µmol/kg DM) supporting this diagnosis. SAC C VS commented that delayed swayback is more common in two- to four-month-old lambs.

### Toxic conditions

Ayr diagnosed *Pieris* species poisoning in four Suffolk and Texel-cross ewes. Two ewes were found dead and two were euthanased due to recumbency and severe dyspnoea. At postmortem examination leaves typical of

*Pieris* species were found in the rumen content. The animals had escaped into a garden 48 hours before clinical signs were detected. Grayanotoxins in *Pieris* species bind sodium channels and have their main effects on cardiac and skeletal muscle and the nervous system (Payne and Murphy, 2014).

### Parasitic diseases

Edinburgh found that *Nematodirus battus* made a significant contribution to the worm burden in a six-month-old Lleyn lamb diagnosed with parasitic gastroenteritis. Three lambs from a group of 700 at grass had lost condition and died. The submitted lamb was stuporous and had a body condition score of one. *Teladorsagia circumcincta* (48,700) were recovered from the abomasum and *N. battus* (21,200) from the small intestine. The affected lambs had probably either been missed or under-dosed when anthelmintic treatment was administered in August.

Dumfries diagnosed haemonchosis in a upland mule flock with ill thrift in all ages of ewes. An on-farm postmortem examination revealed an anaemic carcass with a worm egg count of 5,000 eggs per gram (epg) and no evidence of liver fluke. A faecal sample from a second ewe also had a high strongyle egg count of 11,900 epg. Staining with the peanut agglutinin test was carried out and two per cent of eggs examined fluoresced under UV light, confirming the involvement of *Haemonchus contortus* as part of a mixed nematode burden.

Ayr diagnosed trichostrongylosis in 14 lambs, from a group of 240, that died over a four-day period. Three carcasses submitted for postmortem examination had profuse, watery, black scour. High numbers of *Trichostrongylus columbriformis* and *Trichostrongylus vitrinus* worms were found in the small intestine and strongyle egg counts in excess of 7000 epg were detected. The lambs had been moved two months previously to clean grazing, which was three weeks after an oral moxidectin drench. The farmer did not anticipate a significant nematode burden, as he assumed five weeks of persistent anthelmintic activity after treatment. However the persistent activity claim on the datasheet does not include *Trichostrongylus* species.

### Generalised and systemic conditions

Ayr diagnosed black disease due to *Clostridium novyi* infection as the cause of death of a Texel-cross ewe. *Fasciola hepatica* tracts were widespread in the liver and a small number of immature fluke were seen. A focus of necrotic hepatitis was present and *C. novyi* was confirmed by fluorescence. The owner reported that the ewe was vaccinated against clostridial diseases; however, it was unclear whether datasheet recommendations had been followed.

### Alimentary tract disorders

Aberdeen diagnosed cholangiocarcinoma on histopathology of a liver from an ill thriven 18-month-old gimmer that was submitted from an on-farm postmortem examination. Half of the liver appeared grossly abnormal with a knobbly appearance. Some of the parenchyma was pale, firm and interspersed with pockets of purulent liquid. Thirty-one per cent of neoplasms in an abattoir survey by Anderson and Sandison (1968) were hepatic in origin; eight per cent of which were cholangiocarcinomas and all were detected in sheep over one year of age.

### Respiratory tract conditions

St. Boswells diagnosed laryngeal chondritis in an 18-month-old Texel tup that was unsuccessfully treated for the condition over the previous few weeks. The laryngeal lumen was found to be narrowed due to swelling of the left side of the larynx (Figure 1).



Figure 1. Occlusion of laryngeal lumen in laryngeal chondritis

The left arytenoid cartilage was necrotic and contained a moderate quantity of pus (Figure 2).



Figure 2. Abscessation of the left arytenoid cartilage in laryngeal chondritis

There was a large amount of foam in the airways and the lungs were heavy, congested, haemorrhagic and oedematous, consistent with asphyxia. Texel sheep may be predisposed to laryngeal chondritis due to their short neck, which may affect the shape of the larynx or its relationship to adjacent tissues. Scott (2007) proposed that, during rut, increased testosterone levels causing oedema in the larynx may explain an increase in the condition in autumn.

### Nervous system disorders

Perth diagnosed louping ill in a group of 230 lambs, brought from a remote island to rough grazing on the mainland, in which fourteen deaths occurred over four days. Neurohistopathology revealed lesions consistent with louping ill, which was confirmed by immunohistochemistry. A lack of inflammatory cells was noted, which suggested a peracute infection. The outbreak illustrates the serious losses that can ensue following the transfer of naïve animals to a louping ill endemic area.

### PIGS

#### Nutritional and metabolic disorders

Edinburgh diagnosed congestive cardiac failure in a six-month-old, Gloucester old spot cross-Oxford sandy back pig, the second to die from a litter on a hobby farm. Seven of the litter of 12 were dull, intermittently pyrexial, with bright purple ears and snouts. Pneumonia was suspected and some appeared to respond to antibiotics and NSAIDs. The pigs were administered iron at birth, but were not vaccinated. They were being fed brewer's grains, some fruit and vegetables, sow rolls and bread. At postmortem examination the gilt was in good condition. There was mild purple discoloration of the ears and abundant straw coloured effusions containing fibrin strands in the thoracic cavity and pericardial sac and a small amount of similar fluid in the abdomen. The lungs were wet and heavy, with prominent interlobular oedema (Figure 3) and the liver was congested. Histopathology revealed widespread myofibre degeneration in the heart (Figure 4) and skeletal muscle, with reactive changes and early repair associated with some fibres.



Figure 3. Nutritional myodegeneration. Note pleural effusion and pulmonary oedema

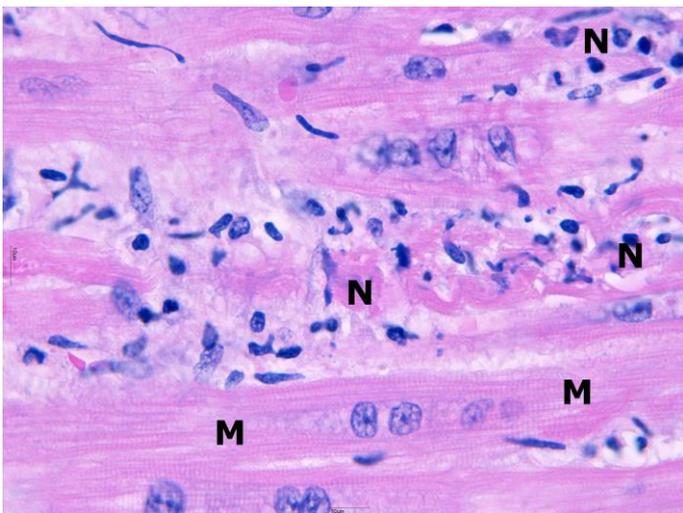


Figure 4. Nutritional myodegeneration. Necrotic cardiac myofibres (N) with hyper-eosinophilia fragmentation and nuclear debris. Viable fibres (M) with cross striations

Nutritional cardiomyopathy was diagnosed and the remaining pigs were injected with vitamin E and selenium, and commercial grower pig feed was introduced. However, two pigs died within a few hours of being weighed seven days later, with one showing signs of severe respiratory disease. At postmortem examination a small amount of fluid with fibrin strands was present in the pericardial sac of both pigs and in one pig the lungs were oedematous and thick fibrin strands were present on the surface of the liver. Histopathology revealed very extensive acute myofibre degeneration with some evidence of repair in the skeletal muscle, particularly the diaphragm, but very limited pathological changes in the myocardium. It was proposed that the stress of handling had induced further muscle damage

and had led to respiratory failure rather than circulatory failure in these pigs. Advice was given to avoid unnecessary handling and to investigate the dose of vitamin E and selenium administered.

#### Generalised and systemic conditions

Aberdeen diagnosed streptococcal meningitis and septicaemia as the cause of marked lameness with recumbency or neurological signs. Antibiotic in-feed medication was discontinued following a partial depopulation and three weaners died in the affected group of 220 on an indoor unit of 2,500 animals. Treatment of affected individuals with penicillin early in the disease appeared to be effective. An on-farm postmortem examination identified pleuritis and peritonitis. Three pigs that were submitted for postmortem examination had fibrin tags on the pleural or peritoneal surface and an excess of pericardial fluid. The joints contained an excess of yellow coloured fluid, which was purulent in one case, and the meninges were thickened with a yellow exudate present on the cerebral surface. Bacteriology revealed a light growth, which included *Streptococcus suis* Serotype 2, in cultures from the lung, liver, brain and from various joints.

#### Reproductive tract conditions

Dumfries received blood samples were from a herd where an increased number of sows and gilts were returning to service. In addition pigs that were confirmed as pregnant were found to be empty at farrowing. All eight samples tested positive for antibodies to *Leptospira Bratislava* and in four cases the titres were high (>1/400). These findings suggested that the titres were significant and further monitoring is being carried out.

#### BIRDS

##### Game birds

Inverness made a presumptive diagnosis of leucocytozoonosis in a ten-week-old pheasant, based on histopathological findings in the brain. The bird was in a group of recently purchased pheasants that were in poor body condition. One per cent mortality over a two-day period was seen. The birds submitted alive were tick infested, weak and uneven in size with body weight ranging from 350 to 570 g. The crops and gizzards were poorly filled and there was an excess of urates in the ureters of all birds indicating insufficient water intake. Histological examination in one bird showed perivascular lymphocytic cuffing randomly distributed in the brain and, in one area, four parasitic-like cysts suggestive of possible *Leucocytozoon* species infection. No obviously parasitized blood cells were found in the histological sections from this case. Leucocytozoonosis is a parasitic disease of birds affecting blood and tissue cells of internal organs. Infections are most often subclinical, but

can occasionally cause clinical and even fatal disease due to anaemia.

St Boswells found a heavy burden of *Spironucleus (Hexamita) meleagridis* in the intestine of a three-month-old pheasant, from a group of 800 where the occasional bird showed signs of malaise and poor body condition. In older poults, hexamitiasis can take a chronic form, where over a period of a few weeks affected birds become extremely thin and lose virtually all their breast muscle.

Ayr examined two eight-month-old modern gamebirds. Four birds had died in this 15-bird batch over the previous week. Clinical signs noted by the owner included eye discharge and difficulty in breathing. At postmortem examination the birds had a bilateral clear eye discharge and pus in the sinuses. At histopathological examination a sub-acute, active tracheitis with epithelial degeneration and attenuation were seen. There also were areas of ulceration and exudation and widespread mixed inflammatory cell infiltrates in the trachea. A *Mycoplasma* species and *Gallibacterium anatis* var *haemolytica* were isolated from the sinuses. The *G. anatis* was likely to be secondary to the *Mycoplasma* species infection.

#### Wild birds

Perth diagnosed avian tuberculosis in an adult buzzard (*Buteo buteo*) that was found dead on a golf course. Body condition was poor and the crop appeared impacted with fur balls. The right lung was almost completely obliterated by a 4 cm diameter caseous yellow mass with many smaller caseous lesions on the left lung and liver. Numerous acid-alcohol fast bacilli were seen on a Ziehl-Neelsen stain of the lesions.

## MISCELLANEOUS

#### Horses

Perth diagnosed urolithiasis, with septic cystitis and pyelonephritis in a Shetland pony stallion that had shown malaise and subsequently died. At postmortem examination body condition was good and the mucous membranes appeared congested. The ventral abdominal wall the adjacent mass of intestines showed some fibrinous deposits and a moderate quantity of dark-yellow, blood-tinged peritoneal effusion was seen. Perihepatitis and perisplenitis were seen, with fibrinous deposits on the capsule. Both renal pelvices and ureters were full of pus. The bladder contained a large (260 g) rough yellow urolith, numerous smaller, yellow-brown rough uroliths and pink, thick, purulent urine. The urethra was bruised in places, but no urethral obstruction was evident and the bladder did not show signs of over-distension. The uroliths were composed mainly of

calcium deposits with some struvite present. *Streptococcus dysgalactiae* subsp. *equisimilis* was isolated in pure culture from the bladder contents.

#### Wild animals

Inverness diagnosed pneumonia in a juvenile female red squirrel (*Sciurus vulgaris*). The animal was found weak at road side and died the following night. At postmortem examination the lungs were hyperinflated with a marbled appearance and firm consistency. Histopathology revealed a subacute, necrosuppurative to granulomatous bronchopneumonia, with intralesional plant material and bacteria, consistent with aspiration of food material. Underlying areas of fibrosis and adenomatous change, with tall columnar epithelium, were also seen. These changes are suspicious of underlying pox viral infection, but no viral inclusions were seen.

#### Exotic animals

Inverness diagnosed acute kidney failure in a two-month-old Chinese goral (*Naemorhaedus griseus arnouxianus*). Sudden onset of malaise followed by death was reported and an adverse drug reaction was suspected. Previous treatment included diclazuril and deltamethrin. At postmortem examination both kidneys were markedly pale and the bladder was dilated with grossly normal urine. Histopathology revealed a marked, acute renal tubular necrosis and a toxic aetiology was suspected.

#### References

- ANDERSON, L, J. & SANDISON, A, T. (1968) Tumours of the liver in cattle, sheep and pigs, *Cancer*, **21**, 289-301.
- PAYNE, J & MURPHY, A. (2014) Plant poisoning in farm animals. *In Practice*, **36**, 455-465.
- SCOTT, P. R. (2007) *Sheep Medicine*, p 154, Manson Publishing Ltd.

## Feature – Lead Poisoning in Cattle

Lead is the most common cause of poisoning in farm animals in Great Britain, according to the Veterinary Investigation Diagnosis Analysis (VIDA) data. Poisoning is commonly caused by the accidental exposure to toxic quantities of lead, after licking compounds such as discarded car batteries or lead paint. The general sale of lead-based paint was banned in the United Kingdom in 1992.

In acute lead poisoning, affected cattle may die suddenly or present with muscle tremors and twitching, and neurological signs such as tonic-clonic convulsions and opisthotonos. In sub acute and chronic cases, the clinical picture is more protracted and there may be anorexia, dullness, blindness, gastrointestinal disturbances and anaemia.

Between 1993 and September 2014, SAC Consulting Veterinary Services made 236 diagnoses of lead poisoning in cattle. Case numbers fluctuated between 4 and 29 with an average of 11 cases a year. During this period, 65 per cent of the diagnoses were made in months May to July, possibly because cattle recently turned out to pasture at this time are exploring sources of lead compounds discarded over the winter.

Lead is harmful to human health and farmers are obliged to avoid contamination of the food chain with lead. The Food Standards Agency regard lead concentrations over 0.48  $\mu\text{mol/l}$  in blood, 0.10 mg/kg wet weight in meat, or 0.50 mg/kg wet weight in offal to be a food safety risk. When lead levels above these limits are found, an on-farm investigation is carried out to identify and remove the source of lead. Once a source is identified and removed, a 16 week withdrawal period is applied, in order to ensure that residue levels in apparently unaffected animals in the exposed group do not exceed statutory limits. If a source is not found, the withdrawal period may be extended until blood sampling shows that lead levels in the exposed group have returned to normal levels.

### References

PAYNE, J., & LIVESEY, C. (2010) Lead poisoning in cattle and sheep. *In Practice* **32**, 64-69.

