

OVERVIEW

- ***Helicoccus ovis* as a cause of valvular endocarditis in a Charolais bull.**
- **Individual losses due to neoplasia in both cattle and sheep.**
- **Sheep deaths related to toxicities associated with grazing alternative forages.**
- **Fatal infection with intestinal fluke (*Brachylaemus erinacei*) in a hedgehog.**

GENERAL INTRODUCTION

Across the UK December could be summed up as warm, wet, dull and windy. The exception to this was Northern Scotland where mean temperatures were as expected and above average sunshine was recorded in the north-west. The rest of Scotland experienced mean temperatures 0.5 to 1.5°C above the thirty-year (1991 – 2020) average. Rainfall and sunshine figures for Scotland as a whole were 141 per cent and 91 per cent of average.

DISEASE ALERTS

The following conditions were reported by SRUC VS disease surveillance centres in March 2023. Given similar climatic and production conditions, they could also be important this year.

- **Tyre wire (hardware) disease**

Ingested metal objects such as pieces of wire can become trapped in the reticulum with subsequent penetration of the wall leading to traumatic reticuloperitonitis. A review of 503 cases¹ found that the diagnosis was most common in adult cattle during the period between December and April. 87 per cent of affected cattle had an abnormal demeanour with reduced or absent rumen motility in 72 per cent. 43 per cent were pyrexia with spontaneous signs of pain in 36 per cent. These included arching of the back, bruxism or grunting. Only 58 per cent gave a positive response to a foreign body test e.g. withers pinch. Fibrinogen and total protein were the most useful ancillary tests with elevated levels in 69 and 64 per cent of cases respectively.

- **Campylobacter abortion in ewes**

Across the UK as a whole *Campylobacter* spp were the most commonly diagnosed cause of ovine abortion in spring 2023. This was not the case in Scotland where it was third behind toxoplasmosis and EAE. Ring lesions on the liver surface are seen infrequently and positive cultures from foetal stomach contents are required to confirm the diagnosis. In 2023 91 per cent of isolates were shown to be *C. fetus* and 5.6 per cent *C. jejuni*. Detection of potential zoonotic organisms is one reason for investigating abortions. Foetal stomach contents, foetal fluids and placenta are the most important samples to collect.

CATTLE

Nutritional and metabolic disorders

Blood samples were collected from four animals following the sudden death of two beef cows. The herd had been housed since mid-October and were fed pit silage top dressed with meal. Magnesium results ranged from 0.4 to 0.77 mmol/l (reference range 0.8 to 2 mmol/l) confirming deficiency. Inconsistent diet presentation and inadequate feed space were identified as risk factors that may have limited magnesium intake.

Generalised and systemic conditions

A two-year-old Limousin heifer nearing slaughter weight was found dead unexpectedly. It had been housed for two months with 30 other animals on a total mixed ration of straw, maize and barley. Two, 10 to 22 cm diameter abscesses were found within the liver one of which was situated adjacent to the vena cava. There was no visible evidence of thrombus formation but haemorrhage had occurred within the vessel wall. *Trueperella pyogenes* was isolated from the pus and histopathology confirmed septicaemia with numerous intravascular Gram-positive bacterial colonies consistent with *T. pyogenes*, thrombosis and suppurative infection in the lungs. The rumen pH was 5.3 and in a very fresh carcass this was not considered significant in relation to the death of this heifer. However, it is likely that subclinical rumen acidosis had been a predisposing factor in development of the liver abscesses.

A sixteen-month-old Aberdeen Angus heifer was submitted following euthanasia to investigate swelling of the neck, brisket oedema and bloating. Postmortem examination found marked enlargement of the cervical and thoracic thymus glands which were firm, white and homogenous on section. Lymph nodes throughout the carcass were up to three times their normal size and a 25 cm mass was found adjacent to one kidney. An additional single circular mass 5 cm in diameter was identified within the ventral rumen wall. Histopathology confirmed thymic lymphoma with metastasis to lymph nodes, kidney and rumen wall. Thymic lymphoma in cattle characteristically occurs in beef yearlings and bloating +/- dysphagia associated with oesophageal compression is a common presentation (Fig 1). Metastasis to non-lymphoid tissues as described in this case is infrequently reported. APHA was informed because lymphoid neoplasia was present but Enzootic Bovine Leukosis (EBL) was not suspected and no further action was taken.



Figure 1 – Thymic lymphoma in a 16-month-old Aberdeen Angus heifer that presented with bloat due to compression of the adjacent oesophagus

Respiratory tract diseases

A widespread cough and increased mortality as a result of respiratory disease was reported in a group of 30 calves. PI3, RSV and IBR vaccinations had been administered and the herd owner was concerned about the possibility of *Mycoplasma bovis* infection. The carcass of a four-month-old Aberdeen Angus cross bull was submitted, and postmortem examination confirmed consolidation affecting 50 per cent of both lungs. *Histophilus somni* was cultured from the lung and detected on PCR testing which also proved positive for RSV. However, RSV was not detected on immunohistochemistry of affected tissue and it was considered an incidental finding. BVD virus positive animals had recently been removed from the holding and it was likely that circulation of virus had a role in the pathogenesis via its immunosuppressive effects.

Musculo-Skeletal conditions

A 130 cow suckler herd reported the birth of four calves with congenital limb deformities. All four had been sired

by the same Limousin bull with two born in spring and two in November. One affected calf was submitted to investigate the problem and found to have syndactyly of all four feet and slight shortening of the forelimbs with mild arthrogryposis (Fig 2). The tibia/fibula and metatarsal bones were markedly shortened and the distal hindlimbs were medially rotated, and partially fused in a flexed position. Cerebellar dysplasia was detected on histopathology and likely contributed to the development of arthrogryposis. Pestivirus PCR was negative. Syndactyly in cattle, also known as 'mulefoot', is inherited as an autosomal recessive trait with variable penetrance in different cattle breeds. The bull had been used to serve the same cows for the previous four years without issues. Breeding history was available for two of the dams and confirmed inbreeding with one cow bred to its sire. The cows shared a grand-sire and a common sire was present in the breeding lines of the bull and both cows. The bull was culled.



Figure 2 – Syndactyly as result of inbreeding in a Limousin cross calf

Circulatory system disorders

A two-year-old Charolais bull lost condition and became recumbent. It was euthanased and submitted for postmortem examination which revealed three foci of endocarditis on the right atrio-ventricular valve (Fig 3), a subtle nutmeg pattern in the liver parenchyma and a single renal infarct. *Helicococcus ovis* was detected in pure culture from the endocarditis lesions. This bacterium has a known association with bovine endocarditis being detected from a third of 54 cases in an abattoir study.² It has also been reported from cases of pneumonia, abortion, mastitis, metritis and post-injection cellulitis. The bull had no history of lameness or ill health that could explain the source of the infection.



Figure 3 – Endocarditis due to *Helicobacter ovis* in a Charolais bull

SMALL RUMINANTS

Toxic conditions

A group of 400 eight-month-old Texel cross lambs were given unrestricted access to a field of turnips for one week. During this time twenty were found dead and three were submitted to investigate the cause. In all cases the carcasses were generally pale with a brown tinge to the viscera and dark brown urine. The rumen contents were green and watery with no evidence of turnip bulb. The findings indicated nitrate/nitrite toxicity due to ingestion of turnip tops. Removal from the field was advised with re-introduction to be carried out slowly with strip grazing and provision of supplementary forage. It was suggested that the recent frosty conditions followed by warmer wet weather had increased nitrate storage in the plants. Late season application of nitrogen fertiliser is another possible risk factor. Following ingestion nitrates are converted into toxic nitrites by bacteria within the gastrointestinal tract. Nitrites are then absorbed into the circulation where they combine with haemoglobin to form methaemoglobin. Methaemoglobin is unable to transport oxygen and is the cause of the characteristic brown discolouration.

Two, seven-month-old Rissington cross ram lambs fed grass, kale, ad lib hay and 100 g of barley/head/day

showed signs of ataxia and dyspnoea in the hours prior to death. Postmortem examination findings of jaundice, watery blood, haemoglobinuria and dark coloured kidneys were consistent with intravascular haemolysis. Chronic copper toxicity is the most common cause of haemolysis in sheep but was ruled out on analysis of liver and kidney. Kale poisoning was therefore suspected as the cause of death as consumption of brassicas is also a risk factor for haemolysis. Severity of disease is proportional to the S-methylcysteine sulfoxide (SMCO) content of the crop with small amounts resulting in poor growth rates. SMCO is hydrolysed to dimethyl sulfide in the rumen and absorbed into the bloodstream where it damages haemoglobin resulting in lysis of red blood cells.

Alimentary tract disorders

A four-year-old highlander ewe at grass was found in sternal recumbency with a bloated appearance. It became dyspnoeic the following day and was euthanased for postmortem examination. This revealed poor body condition, 15 to 20 litres of ascitic fluid and a bilateral pleural effusion. White plaques of varying size were found on the pleura and peritoneum and the muscle of the diaphragm had been extensively replaced with firm white tissue. A 70 cm length of the mid jejunum was abnormal with a thickened white wall (Fig 4) and a 2 to 3 cm long mass was found attached to the mucosa but not obstructing the lumen. Histopathology confirmed a diagnosis of intestinal adenocarcinoma with extensive infiltration of the diaphragm. Stenosis of blood and lymphatic vessels passing through the diaphragm could account for the pleural effusion.



Figure 4 - Adenocarcinoma infiltrating the wall of the mid-jejunum in a Highlander ewe

Four goats from a herd of 89 breeding animals died after developing acute diarrhoea. The first three deaths were of yearlings with the losses occurring over the course of a month. The fourth case was an eight-month-old Boer kid which was submitted after failing to respond to treatment with fluids, antibiotics and corticosteroids. Postmortem examination found mural oedema and a thickened corrugated mucosa along a 100 cm length of the distal jejunum. The associated mesenteric lymph nodes were markedly enlarged with 1 to 4 mm diameter white foci visible within the parenchyma (Fig 5). Mucosal ulceration was noted at the ileo-caecal junction and within the caecum. *Yersinia pseudotuberculosis* was isolated from both jejunum and mesenteric lymph node and histopathology was consistent with a diagnosis of yersiniosis. The farm was open to the public and the client was reminded of the zoonotic potential of *Y. pseudotuberculosis*. A review of shed hygiene and management of risk factors such as stress, poor nutrition, overcrowding and concurrent disease including endoparasites was advised.



Figure 5 – White foci within the mesenteric lymph node in a Boer kid with yersiniosis

Renal diseases

An eight-month-old Lleyn cross lamb from a group of 50 at grass stopped eating and was found trembling. There was no response to treatment with corticosteroids and antibiotics and it was euthanased. Postmortem examination found a generalised lymphadenopathy with some enlarged nodes having necrotic cores. Both kidneys were very enlarged with white cortices and numerous focal pale firm lesions were present within the spleen and liver. Histopathology confirmed lymphoma. Lymphoma in sheep is usually sporadic but can be associated with EBL virus infection.

BIRDS

Poultry

A flock of 120 layers with access to an outdoor fenced area lost eight birds over the course of a week. At the same time production fell from 100 to 60 eggs a day. Affected birds were found sitting hunched up with closed eyes and died within 24 to 48 hours. No birds had been added to the flock for six months and there had been no apparent stressors. Two carcasses were examined and laryngitis with occlusion of the airway by necrotic debris was the cause of death in both cases. Infectious laryngotracheitis (ILT) was suspected and confirmed on histopathology. This also detected pre-existing damage to the upper respiratory tract possibly as a result of *Mycoplasma* sp infection. It was suggested that this may have predisposed to ILT.

MISCELLANEOUS

Wild animals

A wildlife hospital reported the death of 30 to 40 hedgehogs over a three-week period. This was an unusually high mortality rate and equated to around one third of the hedgehogs admitted during that time. A juvenile female that had died within 24 hours of admission was submitted for postmortem examination. The carcass was emaciated and small numbers of lungworm were visible. The abdominal lymph nodes were prominent and the content of the distal intestine was dark coloured with some evidence of blood. The gastrointestinal tract was washed out and large numbers of *Capillaria* sp worms were recovered along with very large numbers of intestinal fluke (*Brachylaemos erinacei*) (Fig 6). Heavy burdens of *B erinacei* are known to cause weight loss, enteritis, anaemia and death and this was considered the most significant finding. Infection occurs via ingestion of the snail intermediate host which are consumed in large numbers only when more favoured food items are unavailable. As no further casualties were submitted it was not possible to establish a pattern with regards to the increased mortality.



Figure 6 – Large numbers of eggs within the fluke *Brachylaemos erinacei* recovered from the intestine of a hedgehog

References:

1 Braun U, Warislohner S, Torgerson P, Nuss K, Gerspach C. Clinical and laboratory findings in 503 cattle with traumatic reticuloperitonitis. *BMC Vet Res* 2018;14:66 <https://doi.org/10.1186/s12917-018-1394-3>

2 Kutzer P, Schulze C, Engelhardt A. *et al.* *Helicoccus ovis*, an emerging pathogen in bovine valvular endocarditis. *J Clin Micro* 2008; 46(10): 3291-5