

OVERVIEW

- **First diagnoses of lungworm in cattle for 2022**
- **Haemothorax in a neonatal Holstein calf secondary to a congenital weakness in the vena cava**
- **Delayed swayback in Suffolk cross lambs**

GENERAL INTRODUCTION

The monthly mean temperature was 0.8 °C above average, with the north-east being warmest relative to average. Rainfall was well below average in some parts of the east, but above average in the west and south-west, with an overall figure of 80 per cent. Sunshine was above average in the north and nearer average in the south, with 116 per cent of average overall.

DISEASE ALERTS

The following conditions were reported by SRUC VS disease surveillance centres in September 2021. Given similar climatic and production conditions, they could also be important this year.

- **Autumn nematodirosis in weaned lambs**
Nematodirus battus challenge in autumn could result from hatching of eggs deposited in spring, hatching of eggs deposited the previous autumn or unusually prolonged survival of infectious larvae that emerged earlier this year. The latter is only likely if larvae are present in areas where they are protected from exposure to ultra-violet light. Outbreaks of autumn nematodirosis suggest that lamb exposure to *Nematodirus battus* earlier in the year has been insufficient to allow immunity to develop.
- **Louping ill**
Louping ill diagnoses peak in September. Confirming a diagnosis of louping ill in a live animal relies on serological detection of antibodies to the virus with a predominance of IgM indicating recent infection. Postmortem diagnosis requires brain histopathology supported by immunohistochemistry. In the absence of vaccination tick control is the mainstay of prevention.

CATTLE

Nutritional and metabolic disorders

Eight from a group of 35 beef cows were scanned not in calf and six were blood sampled to investigate the infertility. Testing confirmed hypocupraemia as the likely cause of the problem with one result below the lower detection limit of the test and a mean of 4.1 umol/l (reference range 8 to 25 umol/l).

Parasitic diseases

A 700 head spring calving dairy herd reported the death of five cows and submitted the carcass of a seven-year-old Ayrshire cow for postmortem examination. The carcass was jaundiced and the liver was pale. The abomasal mucosa was covered in small, raised nodules with a central pore (Fig 1) and there was a marked scour. No evidence of a patent nematode infection was detected but *Ostertagia ostertagi* worms were identified within the abomasal contents and ostertagiasis was confirmed on histopathology. The jaundice was explained by hepatic lipidosis and necrosis that was considered severe enough to kill the cow. Ostertagiasis is an unusual diagnosis in a mature dairy cow and it was not clear whether or not the previous deaths were related. It was advised to screen cohorts for evidence of parasitism before considering treating the whole herd with anthelmintics. In these circumstances it can be useful to measure plasma pepsinogen levels in addition to carrying out worm egg counts.



Figure 1 – Typical *Ostertagia* damage giving a Moroccan leather appearance to the abomasal mucosa

Ostertagiasis also proved to be the cause of poor body condition and malaise in a group of 30 homebred stirks

and heifers. The carcase of a 27-month-old simmental cross heifer was found to be emaciated with the typical 'moroccan leather' appearance to the abomasal mucosa. The strongyle egg count was 19450 eggs per gram and 48000 worms were recovered from the abomasum, 90 per cent of which were *Ostertagia ostertagi*. A blood sample from a second animal returned a raised pepsinogen result of 4.8 iu/l (reference range ≤ 1.5 iu/l). The group were reported to have been treated with a combination fluke/worm pour on the previous month. For welfare reasons immediate re-treatment with a product from a different anthelmintic group was advised.

The carcase of a two-year-old salers heifer weighing only 200 kg was submitted to investigate an issue with weight loss and death in a group of cattle. Postmortem examination confirmed heavy *Bovicola* species (biting louse) infestation, chronic liver fluke and ostertagiasis. The group had been treated with a persistent anthelmintic at turnout however on further investigation the product used was out of date and may have been frozen over the winter. Deaths due to lungworm infection were diagnosed in the north-east and south-west of Scotland during the second half of June. Beef cross stirks were affected in both outbreaks and postmortem examination findings included lung emphysema and numerous *Dictyocaulus viviparus* in the airways.

Generalised and systemic conditions

A number of animals from a group of 150 young dairy heifers developed diarrhoea and were treated with anthelmintic and anticoccidial products. However, a pooled faecal sample collected pre-treatment later proved negative for both worm eggs and coccidial oocysts. The heifers had been rotationally grazed around 12 paddocks for two months. Hard feed was also provided, and live weight gains had been good until the previous two weeks. One week after treatment a three-month-old calf that had not previously appeared to be faecal stained was found recumbent and euthanased for postmortem examination. The mucosa of the mid to distal small intestine and caecum was reddened with a slightly granular appearance, diarrhoea was evident and the mesenteric lymph nodes were enlarged. *Yersinia pseudotuberculosis* was isolated from the ileum and histopathology confirmed a purulent and ulcerative enteritis consistent with yersiniosis. No evidence of parasitic damage was detected. *Y pseudotuberculosis* can be found in the gastrointestinal tract of healthy livestock and wildlife and is potentially zoonotic.

Renal diseases

A housed four-to-five-month-old male wagyu calf developed ventral and hindlimb oedema over the course of a few days and became recumbent prior to death. A number of calculi were noted adhered to the hairs around the prepuce and a single large urolith was found obstructing the urethra 20 cm proximal to the end of the penis (Fig 2). Analysis suggested that both struvite (magnesium ammonium phosphate) and calcium oxalate were present. Risk factors for urolithiasis in cattle include high concentrate/low forage diets and restricted access to water. It was hypothesised that the calf in this case may have been selectively eating the meal and barley provided in preference to the straw. At the time of presentation, the other 38 animals in the group appeared well.



Figure 2 – Urolith in the opened urethra of a wagyu cross calf with haemorrhage in the anterior portion.

Circulatory system disorders

A full-term embryo transfer Holstein heifer was born via a straightforward assisted calving but faded and died. Postmortem examination revealed carcase pallor due to a right sided haemothorax but no evidence of dystocia. The source of the bleeding was two, 1 to 2 mm diameter holes in the wall of the caudal vena cava 3 cm proximal to the diaphragm (Fig 3). The vessel wall appeared thin at this site. Histopathology confirmed that the endothelium was missing and that the tunica intima and tunica media were degenerate and reduced in thickness by 60 to 70 per cent. A thrombus was present on the luminal surface and there was dissecting haemorrhage in the tunica adventitia and surrounding tissues. There was no inflammation in the vessel wall and a one-off congenital weakness in the vena cava causing the endothelium and possibly the intima and media to split and tear was suspected.

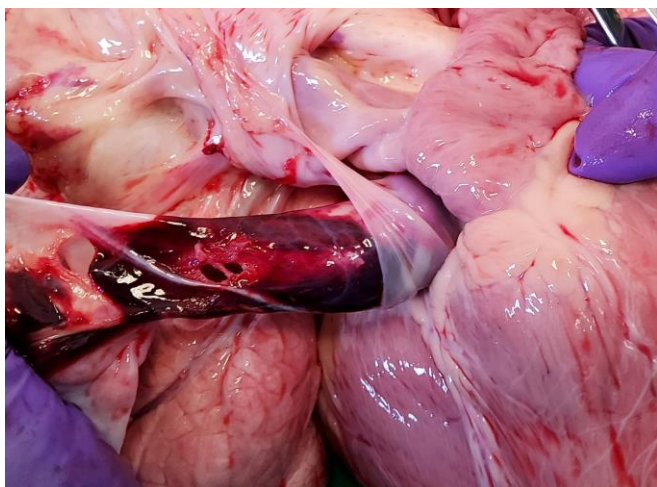


Figure 3 – Thinning and two points of perforation of the caudal vena cava in a neonatal Holstein calf

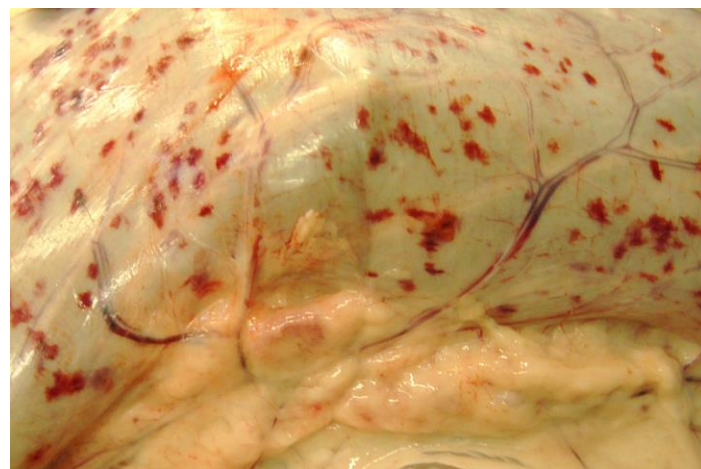


Figure 4 – Ecchymotic haemorrhages on the abomasal serosa of a lamb with *Mannheimia haemolytica* septicaemia

SMALL RUMINANTS

Nutritional and metabolic disorders

A two-month-old Suffolk cross lamb became progressively paretic on its hind legs over the course of two weeks before becoming recumbent. Examination confirmed bilateral loss of proprioception with intact withdrawal reflexes. The fore legs were unaffected. The brain and spinal cord were unremarkable on postmortem examination however histopathology detected a paucity of myelin and vacuolation of white matter mainly within the cerebrum. Chromatolytic and necrotic neurones were found in the vestibular nuclei and medulla plus the ventral horns of the cervical and thoracic spinal tracts. These findings were consistent with a diagnosis of delayed swayback and a liver copper result of 74.6 $\mu\text{mol/l}$ (reference range 314 to 7850 $\mu\text{mol/l}$) supported the diagnosis. On the day of submission its twin was showing early signs of hind leg weakness but no other lambs in the 60-ewe flock were affected at that time.

Generalised and systemic conditions

An eight-week-old Texel cross lamb was found in lateral recumbency and died soon after. It was the second loss from a group of 200. Postmortem examination detected petechial haemorrhages on the muscles and kidneys, extensive ecchymotic haemorrhages on the abomasal and intestinal serosa and cloudy meninges (Fig 4). A pure growth of *Mannheimia haemolytica* was isolated from the brain and histopathology confirmed a severe suppurative meningitis and septicaemia. There was no evidence of thrombocytopaenia or vasculitis to explain the haemorrhages and their aetiology remained unclear.

Alimentary tract disorders

Abomasal bloat and rupture was diagnosed as the cause of sudden death of eight animals from a group of 36 pet lambs. Three lambs aged between three and five weeks were submitted for postmortem examination. Histopathology revealed numerous bacteria on the abomasal mucosa with a distinct tetrad arrangement consistent with *Sarcina* sp. *Sarcina* sp proliferation is recognised in cases of abomasal bloat in young lambs and is particularly associated with artificial rearing. It is unclear if the *Sarcina* sp are the cause of the bloat or if the change in the microenvironment that leads to bloat also favours their proliferation. The lambs were bottle fed milk replacer three times a day and had access to creep feed. At four weeks-of-age bottle feeding was reduced to twice a day with a greater volume of milk fed each time. A new batch of creep feed had been introduced the week before the first death. These dietary changes may have produced conditions conducive to both abomasal bloat and proliferation of *Sarcina* sp.

PIGS

Nutritional and metabolic disorders

A herd of 200 breeding sows reported periodic issues with mortality and diarrhoea in pre weaned pigs resulting in subsequent poor performance. Seven piglets were submitted of which five were live, weak and lethargic. Postmortem examination detected navel abscesses in two and abscesses around the jaw in a third. Minimal milk was found in the stomachs and in one case the liver and kidneys were very pale. Histopathology revealed diffuse vacuolation of the hepatocytes in this animal which was considered to be secondary to a severe metabolic insult. Testing failed to detect any evidence of infectious disease and poor sow milk supply was believed to be the underlying cause.

SRUC VS Ovine Abortion Diagnoses 2022

This spring SRUC VS investigated the cause of ovine abortion in 287 submissions from 235 Scottish flocks and a further 163 submissions of foetal material were received from 143 farms out with Scotland. Nineteen per cent fewer Scottish farms investigated cases of ovine abortion compared to 2021 resulting in 12 per cent fewer submissions overall.

A diagnosis was reached in 41 per cent of submissions from Scottish flocks, with a diagnostic rate of 44 per cent in 156 submissions to postmortem (PM) centres compared to 35 per cent for postal submissions.

The breakdown of abortion diagnoses for Scottish submissions in 2021 and 2022 are shown in Fig A. Enzootic abortion of ewes (EAE) and *toxoplasmosis* were the most frequently made diagnoses in both years representing 28 per cent and 24 per cent of all diagnoses in 2022, respectively. Abortion due to *Campylobacter* species increased by 2 per cent and *Campylobacter fetus* was responsible for 67 per cent of these diagnoses with the remainder due to infection with *Campylobacter jejuni* (Fig B).

Dystocia was diagnosed as the cause of foetal death in 9 per cent of submissions to PM centres, but none of the postal submissions of ovine foetal material. The diagnosis of dystocia is made on the detection of traumatic injury e.g. fractured ribs on postmortem examination, and supported by histopathological evidence of tissue anoxia particularly affecting the brain. The difference may be due to practitioners making this diagnosis solely on history and gross examination, and therefore not submitting material for further investigation.

The diagnosis not listed category predominantly includes cases where bacterial species such as *Streptococcus dysgalactiae*, *Bibersteinia trehalosi* and *Streptococcus uberis* have been isolated in pure growth from foetal stomach contents. These are usually sporadic causes of ovine abortion. Contamination of foetal stomach contents with *E. coli* or other environmental bacteria may occur if aseptic technique is broken during sample collection and postage allowing growth of the bacteria in samples. Postmortem invasion of tissues following foetal death can also lead to bacterial growth in foetal stomach contents, therefore degree of foetal autolysis will alter the interpretation of bacterial culture. Histopathological evidence of placentitis or foetal antigenic response is supportive of a genuine infection rather than contamination.

Schmallenberg virus was detected only once on PCR testing of brain tissue from a single submission from a small flock lambing in late January. Seven of ten ewes lambed and of those, three gave birth to one lamb with arthrogryposis. Two of these ewes and one barren ewe tested seropositive for Schmallenberg antibody. Despite offering free diagnostic testing, no further cases of foetopathy or congenital deformity due to Schmallenberg virus infection were detected by SRUC Veterinary Services.

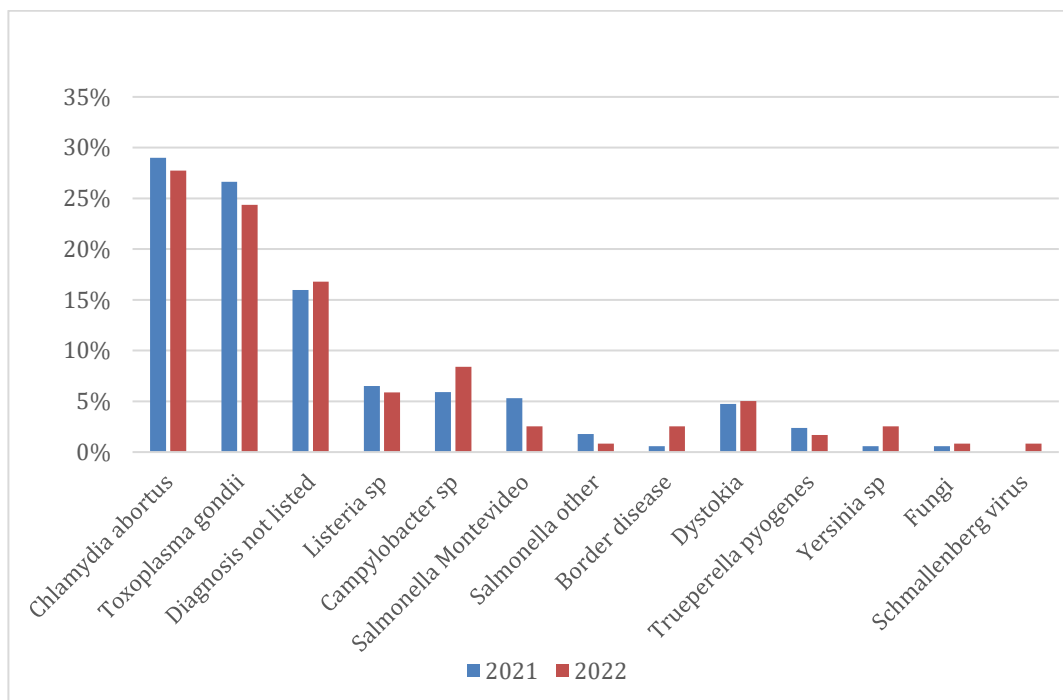


Figure A: SRUC Veterinary Services ovine abortion diagnoses in submissions from Scottish holdings 2021 and 2022

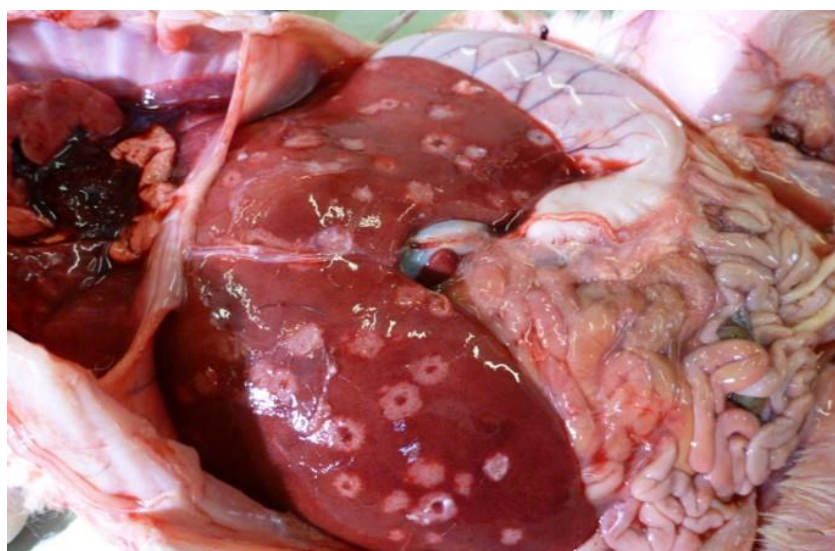


Figure B: Foetal liver lesions in a case of *Campylobacter* sp abortion. Such obvious pathology is uncommon.