

## OVERVIEW

- **Jejunual haemorrhage syndrome in dairy cows**
- **Ectodermal dysplasia in an aborted fleckvieh calf**
- **Sheep deaths due to haemonchosis**

## GENERAL INTRODUCTION

The unsettled weather recorded in July continued into August. Despite rainfall being 86 per cent of the 1991 to 2020 average, it was duller than average with 94 per cent sunshine hours. The mean temperature was 13.8°C, 0.6°C above the 1991 to 2020 average.

### DISEASE ALERTS

The following conditions were reported by SRUC VS disease surveillance centres in November 2022. Given similar climatic and production conditions, they could also be important this year.

- **Losses due to *Histophilus somni* in housed beef youngstock**  
*H somni* should be considered as a potential differential diagnosis in a range of clinical presentations in housed beef youngstock. Sudden death, pneumonia, neurological signs, lameness and recumbency can be seen alone or in combination.
- **Histomonosis (blackhead) in turkey poults**  
Blackhead is most common in turkey poults up to 14 weeks of age. Infection with *Histomonas meleagridis* protozoa occurs via ingestion of *Heterakis* spp eggs or earthworms which act as paratenic hosts for *Heterakis* larvae. Rearing turkeys on ground previously used for chickens is a risk factor as *Heterakis* eggs can remain viable in soil for many months.

## CATTLE

### Generalised and systemic conditions

A six-day old dairy calf was euthanased to investigate a three to four-month issue with suspected pneumonia in neonatal calves. Some affected animals responded to treatment while others became recumbent and died. Bilateral lung consolidation limited to only 15 per cent of the total lung field was detected on postmortem examination and *Salmonella enterica* serotype Dublin was isolated from the faeces, liver and spleen and only *Escherichia coli* isolated from the lung. Carcase submission was prompted by a diagnosis of salmonellosis in a cow the previous week after it aborted and developed metritis, diarrhoea, pyrexia and milk drop. A second cow aborted, and S Dublin was isolated from the foetal stomach contents and dam faeces. The findings illustrate the range of presentations that can occur during a salmonellosis outbreak. The calving environment was a possible source of infection in this case with calvings taking place in a pen housing 12 to 15 dry cows.

### Alimentary tract disorders

*Salmonella enterica* serotype Derby was isolated from two of three faecal samples submitted from a group of Simmental cross cows that were reported to be thin and diarrhoeic. Further faecal testing failed to detect any other explanation for the clinical signs. *Salmonella* Derby is a group B *Salmonella* sp that is more commonly isolated from poultry and pigs and only rarely identified in cattle. It is not known if either pigs or poultry were present on the holding. Poor body condition may have predisposed to the development of clinical disease in this case.

### Respiratory tract diseases

A six-week-old Hereford cross bull calf was euthanased following a ten-day history of bloating and dyspnoea. Postmortem examination revealed bilateral necrotic erosions and associated soft tissue swelling in the pharynx plus severe necrotic laryngitis with disruption of the normal anatomy. Linear necrotic ulcers were found along the length of the oesophageal mucosa but there was no evidence of tracheitis. The bloat was a result of gaseous ruminal distension. Bacteriology produced very mixed growths, but histopathology confirmed a severe necrotising laryngitis and oesophagitis associated with bacteria some of which resembled *Fusobacterium* spp. The findings were consistent with a diagnosis of calf diphtheria which is a result of *Fusobacterium necrophorum* infection of mucosal erosions. It was considered that aerophagia due to laryngeal necrosis, plus impaired eructation as a result of swelling occluding the oesophagus may have both contributed to the bloat.

However, forestomach dysfunction has been described in association with damage to the vagus nerve in association with pharyngeal pathology so was a further possible cause.<sup>1</sup>

### Musculo-Skeletal conditions

A herd of 50 purebred Aberdeen Angus cattle reported the birth of four or five deformed calves. Affected calves were either born dead or non-viable with severe spine and limb deformities. A typical case was submitted for investigation following delivery by caesarean section. Findings included cleft palate, arthrogryposis, scoliosis, lordosis and kyphosis. Further testing ruled out the teratogenic viruses Schmallenberg and BVD and a toxic aetiology was considered unlikely based on the history. The cause was thought likely to be genetic, with the possibility of arthrogryposis multiplex (curly calf syndrome) a hereditary disease previously reported in Aberdeen Angus cattle. Screening of the dam and sire ruled this out as neither were carriers. The bull had been used the previous year without any issues, however the possibility of another genetic mutation could not be excluded.

### Circulatory system disorders

A four-year-old Holstein cow from a herd of 290 was submitted for postmortem examination after it became the second cow to be found dead within 12 hours. An earlier death ten days previously had raised suspicions of jejunal haemorrhage syndrome (JHS). A blood clot measuring 11 x 6.5 cm was found within the wall of the jejunum, and the intestinal contents were abnormal being dark pink and cloudy with fibrin clots admixed. Histopathology determined that the haemorrhage originated within the mesentery and then dissected along the small intestinal wall between the outer muscle layer and the serosa around at least half its circumference before breaking through the mucosa in to the lumen. This is typical of JHS but the lesion was unusually limited in this case and there was no evidence to suggest that fatal haemorrhage had occurred. There have been reports of sudden deaths associated with this syndrome that may indicate another, possibly vagal, cause of death.

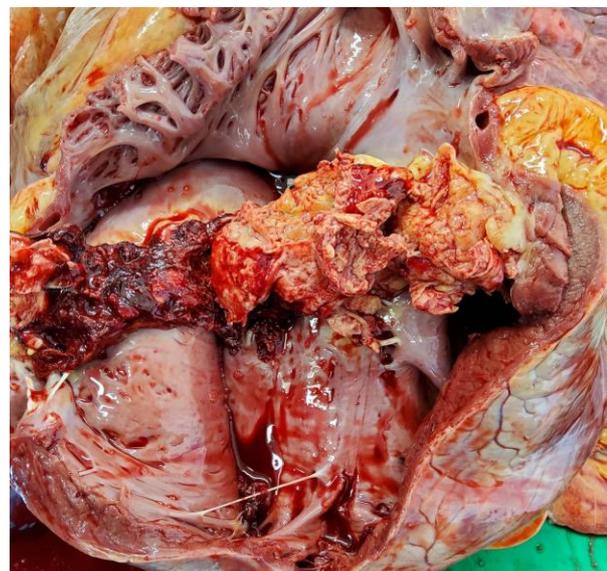
JHS was also diagnosed in a five-year-old Holstein cow that had become recumbent with a subnormal temperature the day before death. The carcass viscera were pale and a 1 to 2 metre section of the distal jejunum was found to contain dark red fluid and long blood clots. *Salmonella enterica* serotype Mbandaka was isolated from the ileum but considered to be an incidental finding in this case. The aetiology of JHS remains unclear and tissues in this case were too autolysed for histopathology.

It has been hypothesised that *Clostridium perfringens* type A and fungal infections may have a role in the pathogenesis however there was no evidence of either.

A four-year-old Ayrshire cow was reported to be milking poorly and losing condition prior to being dried off. It continued to eat but deteriorated further after calving and became too weak to stand. It was euthanased for postmortem examination which identified evidence of circulatory failure including subcutaneous oedema, serous body cavity effusions and a nutmeg appearance to the liver (Fig 1). A large vegetative endocarditis lesion was found on the right atrio-ventricular valve (Fig 2). There were no significant findings on bacteriology. The diagnosis indicated that there had been an earlier bacteraemia, but the source was unclear. Chronic infections such as metritis or areas of abscessation can act as a source of bacteria.



**Figure 1 – Nutmeg liver as a result of cardiac failure secondary to vegetative endocarditis**



**Figure 2 – Vegetative endocarditis in a dairy cow**

### Skin diseases

A group of imported in-calf fleckvieh heifers were added to a 190 suckler cow herd in February. One aborted at grass in July at around seven months gestation. The foetus showed evidence of marked alopecia with the exception of the distal limbs and tail (Fig 3), and histopathology was suggestive of ectodermal dysplasia. These genetic conditions affect the development of two or more ectodermal derivatives, including hair, teeth, nails, and eccrine glands. In one report of calves with ectodermal dysplasia there was also an absence of nasolabial, intranasal and tracheobronchial mucosal glands, predisposing these calves to neonatal respiratory infections and death.<sup>2</sup> There are no reports of this condition leading to abortion, however a novel genetic defect which incorporates an ectodermal dysplasia and affects foetal viability could not be excluded.



Figure 3 – Ectodermal dysplasia in an aborted foetus

## SMALL RUMINANTS

### Nutritional and metabolic disorders

A group of 170 Cheviot mule gimmers were turned onto a stubble field that had been combined two weeks before. Sufficient grass was reported to be present however two were found dead within the next few days and were examined postmortem. In both cases the rumen was well filled with cereal grains mixed throughout the sweet-smelling contents. The faeces were diarrhoeic. Rumen pH results of 3.8 and 4.2 confirmed a diagnosis of rumen acidosis. A second diagnosis of ruminal acidosis was made in a group of ten, five-month-old beltex tup lambs that had been gathered for dipping the following day. They were housed overnight with access to a store lamb ration in hoppers. The next morning several appeared bloated and stiff and two died within 24 hours. The rumen contents of a markedly autolysed carcass appeared pale with a sour smell and no obvious fibre present. There was profuse watery diarrhoea with the same appearance as the rumen contents. The rumen pH of 5.0 was considered significant given the interval between death and examination.

### Toxic conditions

One hundred and forty Dorset lambs born between April and June were gathered and treated with a levamisole drench and a cypermethrin pour-on. Within two hours fifteen had died after exhibiting signs of ataxia and respiratory distress. Postmortem findings included congested lungs and stable foam within the airways and respiratory failure secondary to levamisole toxicity was proposed as the cause of death. Histopathology confirmed alveolar oedema, however there are no specific lesions associated with levamisole toxicity. The three lambs submitted weighed 16.5, 27 and 32.2 kg and this range, which was replicated across the whole group, may have increased the risk of over-dosing. Levamisole has a narrower safety index than other anthelmintics and analysis of liver samples is in progress to confirm the suspected diagnosis.

### Parasitic diseases

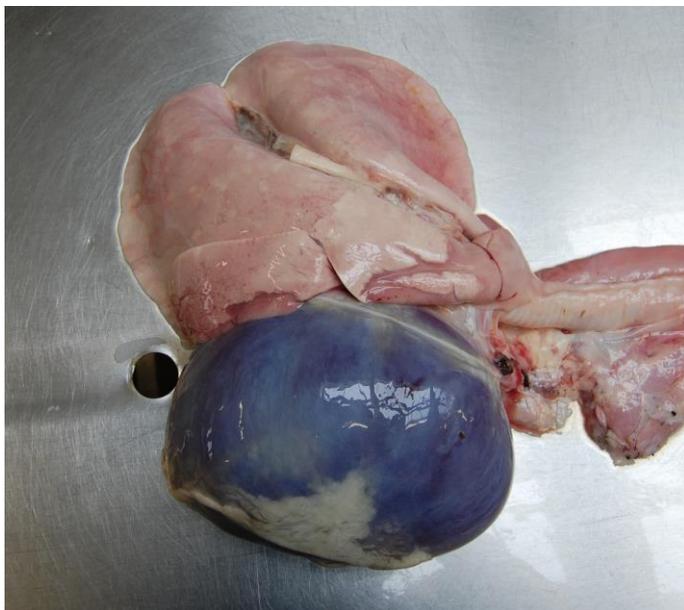
A shearling Valais blacknose tup appeared slow for a few days before being found dead. The four remaining animals in the group were clinically normal. The carcass was in good body condition but pale with body cavity effusions suggesting hypoproteinaemia. Around 33,800 worms were recovered from the abomasum of which 35 per cent (11,830) were identified as *Haemonchus contortus*. The strongyle egg count was 16,200 eggs per gram (epg) and despite the mixed worm burden there was no evidence of diarrhoea. Haemonchosis was recorded as the cause of death and prompt anthelmintic treatment of the other sheep was advised.

Haemonchosis was also diagnosed in a four-month-old Texel cross lamb in a flock that had lost 15 to 20 lambs over a period of several weeks. An on-farm postmortem examination detected evidence of anaemia and a large number of worms within the abomasal contents which were later confirmed as *Haemonchus contortus*. High fecundity in this nematode species explains the very high strongyle egg count of 88,5000 epg. The history provided indicated that an oral ivermectin product had been administered two weeks previously indicating treatment failure. Further information and testing would be required to support or exclude the possibility of anthelmintic resistance.

### Circulatory system disorders

A four-year-old Valais blacknose ewe from a hobby flock of 14 sheep was presented with a two-month history of lethargy, submandibular oedema and pale mucous membranes, with acute deterioration prior to death. The carcass was pale, and the pericardium was markedly distended with 1.33 litres of blood-stained fluid (Fig 4). An irregular 5cm x 3cm granular lesion with adherent blood clot was found on the right auricle. Similar lesions were

present diffusely over the surface of the epicardium and the serosa of the major blood vessels. Body cavity effusions and a nutmeg appearance to the liver were a result of cardiac failure secondary to cardiac tamponade. Histopathology confirmed multifocal areas of mesothelial proliferation, fibrin deposits and neutrophils indicating a fibrinopurulent peri and epicarditis. There was no evidence of a systemic inflammatory or infectious process. *Escherichia coli* was isolated in scant pure growth from the pericardial sac but the significance of this was not clear. *E. coli* can cause pericarditis in cases of polyserositis, but isolated pericarditis is not commonly reported in animals.



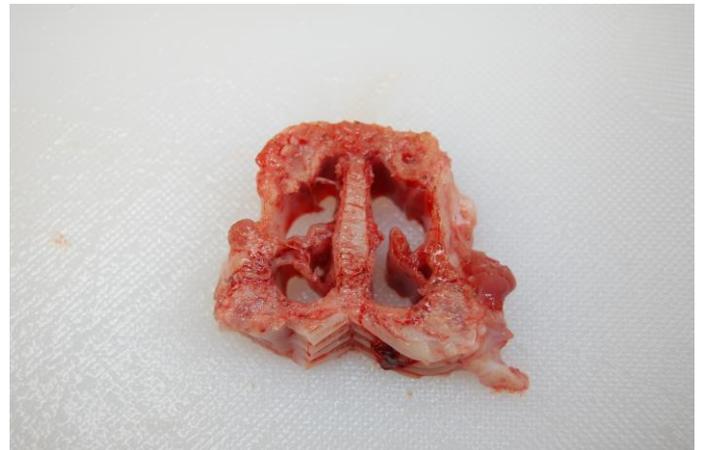
**Figure 4 – Pericardial effusion in a Valais blacknose ewe with pericarditis of unknown aetiology**

## PIGS

### Generalised systemic diseases

Three piglets from a 4000-pig high health weaner unit were submitted to investigate a five per cent prevalence of respiratory disease in piglets two weeks post weaning. The mortality rate was low but there was a significant impact on growth rates. The piglets were undersized with depleted body fat reserves, evidence of pneumonia, pleuritis, pericarditis and atrophy of the nasal turbinates (Fig 5). *Bordetella bronchiseptica* was isolated from the lungs of two piglets with *Streptococcus suis* also detected in one. *Glaesserella parasuis* and *S suis* were cultured from the lung of the third. PCR testing for toxigenic *Pasteurella multocida* proved negative and the nasal turbinate atrophy was attributed to *B. bronchiseptica*. All three pathogens were considered to be contributing to the problem and further testing confirmed involvement of

*S. suis* serotype 2 and *G. parasuis* serotype 13. The isolation of *G. parasuis* serotype 13 is of note as it is not contained within any commercial vaccines.



**Figure 5 – Atrophy of the nasal turbinates as a result of *Bordetella bronchiseptica* infection**

### References:

- 1 Davidson HP, Rebhun WC, Habel RE. Pharyngeal trauma in cattle. *Cornell Vet.* 1981 Jan;71(1):15-25. PMID: 7226842.
- 2 O'Toole D, Häfliger IM, Leuthard F, Schumaker B, Steadman L, Murphy B, Drögemüller C, Leeb, T. 2021. X-linked hypohidrotic ectodermal dysplasia in crossbred beef cattle due to a large deletion in EDA. *Animals*, 11(3), p.657.