

### OVERVIEW

- **Acorn toxicity in cattle and sheep**
- **Losses due to salmonellosis in cattle, sheep and pigs**

#### DISEASE ALERTS

The following conditions were reported by SRUC VS disease surveillance centres in January 2025. Given similar climatic and production conditions, they could also be important this year.

##### **Bovine abortions due to bovine herpesvirus 1 (BoHV-1)**

BoHV-1 (IBR) is an infrequently diagnosed cause of bovine abortion in Scotland and screening for this virus is not part of the routine bovine abortion diagnostic package. There may be no history of recent/concurrent respiratory disease in the herd, or of added animals. Histopathology findings of multifocal necrotising hepatitis are suspicious of BoHV-1 with PCR testing of liver required to confirm the diagnosis. A range of fresh and fixed tissues need to be stored in order to thoroughly investigate abortion outbreaks without a diagnosis following routine bacteriology and serology.

##### **Congenital deformities in lambs due to in utero infection with Schmallenberg virus (SBV)**

Arthrogryposis, kyphosis and scoliosis in aborted or stillborn lambs can be indicative of SBV infection between days 25 and 50 of gestation. Brain abnormalities such as cerebellar dysplasia and hydranencephaly can also be present, and the spinal cord may have a reduced diameter. Early lambing flocks are at greatest risk. PCR testing for virus can be carried out on umbilicus or brain.

### GENERAL INTRODUCTION

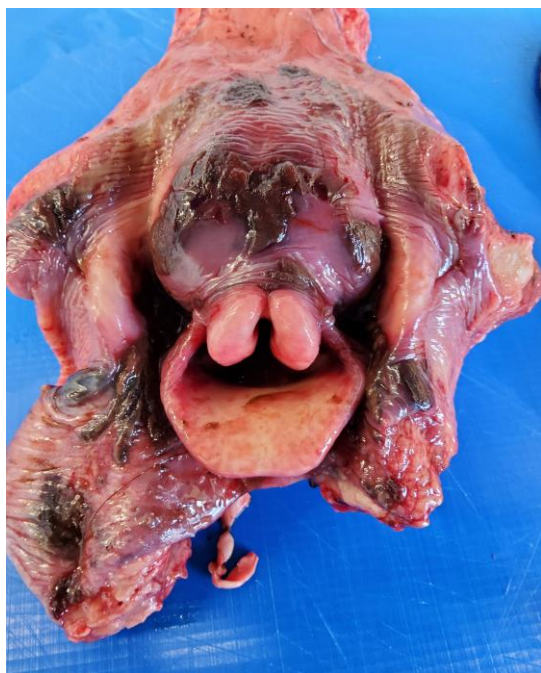
The mean temperature in October was 0.9°C above the 1991 to 2020 average. Overall rainfall was 105 per cent of the thirty-year average with the south-east experiencing dry conditions while it was wet in the Western Isles. It was a very dull month particularly in the west with only 75 per cent of average sunshine recorded.

#### CATTLE

##### **Toxic conditions**

An 18-month-old Simmental cross heifer with a history of depression and dark faeces was blood sampled and found to have raised urea and creatinine levels. It was euthanased and the carcass submitted for postmortem examination. It was the only animal affected in a group of 20, however, the farmer reported that three sheep had died in the same field the previous week and oak trees were known to be present. Significant findings included a pleural effusion and ascites, pharyngeal lesions (Fig 1), severe oesophageal ulceration, typhlitis and dark diarrhoea. The liver was swollen and there was peri-renal oedema and petechiation. The urinary bladder was empty. Rumen fill was good, but the contents were very wet. Only three pieces of acorn were recovered along with two crab apples and three berries. Aqueous humour urea was 121 mmol/l with results over 30 mmol/l indicative of significant renal disease. A diagnosis of acorn toxicity was recorded, and the remainder of the group were moved. It was advised that they should be monitored for the next two weeks. A second herd reported that 10 to 12 animals from a group of 25 were lethargic with poor appetites. A yearling British blue cross heifer died after being off colour for a week and the carcass was submitted for investigation. Postmortem examination found large numbers of petechial haemorrhages subcutaneously and on the epi- and endocardium, kidneys and serosae of the stomachs and intestines (Figure 2). This animal

had small areas of ulceration on the oesophageal mucosa, a swollen liver, peri-renal oedema, an empty bladder and dark liquid faeces. Rumen fill was moderate, but the contents were watery with no fibre or acorns present. The aqueous humour urea was 128.9mmol/l. The group had been moved 11 days prior to the death of this heifer from a field with oak trees at the margins to one without.



**Figure 1 – Pharyngeal lesions in a case of acorn toxicity**



**Figure 2 – Extensive petechiation in a case of acorn toxicity**

### **Generalised and systemic conditions**

A six-month-old Limousin cross calf presented with pyrexia, bilateral nasal discharge, nasal ulceration and corneal opacity. Malignant catarrhal fever was suspected and PCR screening of an EDTA blood sample proved positive for ovine herpesvirus-2. This virus is carried asymptotically by most infected sheep (however, see the small ruminants section below) and there was a history of co-grazing in this case.

### **Alimentary tract disorders**

A herd reported pneumonia issues in both housed and grazing calves. Calves were purchased from numerous sources, but no quarantine or vaccination protocols were in place. The carcass of a thin, six-week-old Holstein calf was submitted and postmortem examination identified extensive ulceration of the oesophagus. There were three, 1 cm diameter ulcers and additional pinpoint ulcers on the abomasal mucosa. One of the large ulcers had perforated prior to death with early signs of peritonitis. Screening for BVD virus proved negative and there were no significant findings on bacteriology. Histopathology confirmed multifocal suppurative inflammation of the oesophagus associated with fungal hyphae. A range of factors can predispose to mycotic oesophagitis in calves including dysbiosis following antibiotic use, immunosuppression secondary to stress/concurrent disease, or feeding and management issues such as poor hygiene. It is likely that the pathology in this calf had a multifactorial aetiology.

### **Respiratory tract diseases**

A herd reported five calf deaths over a four-week period with respiratory signs and a poor response to antibiotics. The holding purchased groups of six to eight-week-old calves every fortnight and administered bovine respiratory syncytial virus, parainfluenza –3 virus, bovine herpesvirus-1 and *Mannheimia haemolytica* vaccines. The carcass of a five-month-old Belgian blue cross was

submitted, and the lungs were found to be heavy and red with minimal consolidation. Haemorrhages were observed on the lungs, spleen and endocardium and the liver was swollen with a mottled appearance. *Salmonella enterica* serotype Dublin was isolated from multiple tissues, confirming a diagnosis of salmonellosis. A six-week-old wagyu cross calf on a second holding died following a short period of severe respiratory distress. It had been purchased along with 21 others from a dairy farm one month before and had received a single dose of a bovine respiratory syncytial virus, parainfluenza –3 virus and *Mannheimia haemolytica* vaccine. Treatment with antibiotics and NSAIDs had been given one week before death. Postmortem examination revealed extensive pneumonia affecting two-thirds of the lung fields. PCR testing failed to detect any evidence of the most common respiratory pathogens however, *S. Dublin* was cultured in pure growth from lung and liver. It is not uncommon for salmonellosis to present as respiratory disease and the diagnosis will be missed if only PCR testing is scheduled. It was suspected in both cases that *S. Dublin* had been introduced with purchased animals.

### Nervous system disorders

A Limousin bull calf was submitted 14 hours after birth and was bright but unable to stand. Forelimb function appeared normal but there was a reduced range of flexion in the hind limb joints and the legs remained extended when it tried to move around. Withdrawal reflexes were absent and there was reduced muscling over the pelvis. No abnormalities were observed in the joints, tendons, nerves and muscles of the hind legs. Removal of the spinal cord revealed an obvious narrowing in the lumbar region where the diameter was reduced from 2 to 0.8 cm (Figure 3). Neuropathology confirmed marked changes at this site including syringomyelia and hydromyelia. No other abnormalities were detected in the brain and spinal cord and it was

considered that a one-off genetic, developmental aetiology was more likely than a viral cause. Examination of any further cases was advised. A similar presentation has been described in a Simmental calf.<sup>1</sup>



**Figure 3 – Congenital narrowing of the lumbar spinal cord in a Limousin calf**

### SMALL RUMINANTS

#### Toxic conditions

Acorn toxicity was diagnosed in sheep from five flocks in the south-west during October with a range of presentations. A mule ewe in good body condition died acutely and was the only loss from a group of 230. Haemorrhages were noted on the conjunctivae, epi- and endocardium, and large numbers of whole and fragmented acorns were found in the rumen (Figure 4). Acidosis was diagnosed as the cause of death in two Scottish blackface tup lambs whose rumens and abomasa were distended with pale, sweet smelling ingesta containing multiple 1–2 mm pieces of acorn fragments. Acorns have a high starch content not dissimilar to barley and the rumen pHs were 4 and 4.4. Ewes from three other flocks had aqueous humour urea results of 85.6, 108, 111 and 144 mmol/l. Anorexia and rapid weight loss were commonly reported and postmortem examination findings included ascites, pale kidneys and typhlitis in one, indistinct white speckling of the kidneys in the second, severe diarrhoea in ewe three and grey kidneys plus soft, black faeces in the fourth. Small numbers of acorns were found in the rumens of two animals only. Acorns and oak leaves contain phenols and tannins such as gallic acid and pyrogallol that are toxic when ingested in sufficient quantities. Cattle and sheep are susceptible to these



compounds which bind and precipitate proteins leading to renal failure. Some animals develop a taste for acorns and have to be removed from any fields where they are present. Pigs are relatively resistant to their effects and can be used to clear acorns.



**Figure 4 – Acorn ingestion causing acute death in a mule ewe**

### Parasitic diseases

A flock that had relocated from Sussex six years earlier reported a poor lambing percentage and loss of ewe condition between scanning and lambing. Only tups were purchased. Four leaner Texel cross cull ewes were submitted for investigation which revealed significant liver damage and biliary fibrosis due to chronic fasciolosis in all cases with adult *Fasciola hepatica* present in three. The ewes had been treated with a combination triclabendazole/ivermectin product three weeks prior to submission. Strongyle egg counts of 100 to 700 eggs per gram (epg) were also detected, and re-infection could have contributed to these. Further testing to assess triclabendazole and ivermectin efficacy was advised. Liver trace element analysis showed low copper status in three with results of 265, 227 and 101  $\mu\text{mol/kg}$  dry matter (DM) (reference range 314–7850  $\mu\text{mol/kg}$  DM). This was unexpected in Texel cross ewes and the possibility of this being a consequence of liver damage was considered.

### Generalised and systemic conditions

A postmortem examination was carried out on a Scottish blackface ewe hogg that died following an episode of mucoid diarrhoea. The ewe was in good condition with uniformly purple lungs and blotchy kidneys. The abomasum and intestines were distended with liquid contents and haemorrhages were evident on the mucosae. There were no significant findings on bacteriology. Histopathology revealed widespread lymphocytic vasculitis affecting multiple organs, including the brain, kidney, spleen, heart, and gastrointestinal tract. These lesions were consistent with systemic necrotising vasculitis which has been described with ovine herpesvirus-2 (OHV-2).<sup>2</sup> PCR testing confirmed OHV-2 infection, and in-situ hybridisation has been requested to confirm viral involvement in the vascular lesions.

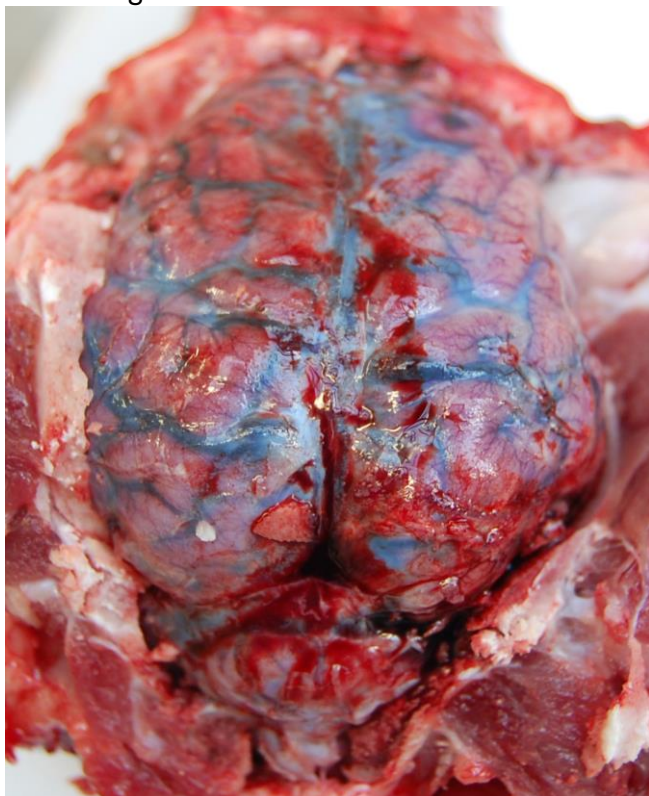
### Alimentary tract disorders

A postmortem examination was carried out on a four-month-old Texel cross lamb which was the second to die from a group of 200. A further 15 lambs were reported to be diarrhoeic. Significant findings included localised bronchopneumonia, mild thickening of the abomasal folds, enlarged mesenteric lymph nodes and diarrhoea. A mixed nematode burden was identified including 6100 *Teladorsagia* spp. in the abomasum, with 1400 *Trichostrongylus* and *Cooperia* spp recovered from the small intestines. *Salmonella enterica* serotype *typhimurium* was isolated from the caecum. Histopathology confirmed damage due to parasitic gastroenteritis with occasional areas of suppurative colitis consistent with enteric salmonellosis.

### PIGS

Nine kunekune pigs from a group of 20 were reported to be displaying neurological signs including seizures, lethargy, head pressing, opisthotonus and blindness. A sixteen-week-old pig died and was submitted for postmortem

examination which found marked reddening of the meninges and moderate amounts of clotted blood on the brain surface (Figure 5). The cerebral gyri were flattened, and the caudal cerebellum was displaced into the foramen magnum consistent with increased intracranial pressure. There was no fluorescence under ultra-violet light and no significant findings on bacteriology. Neuropathology identified severe cerebrocortical necrosis affecting the middle laminae which would account for the clinical signs. Salt poisoning was suspected but an eosinophilic meningitis was not present so a definitive diagnosis could not be made. The pigs were at grass with some supplementary feeding. Water was supplied in a bulk container which had been removed, washed and refilled before being returned to the paddock prior to the onset of clinical signs.



**Figure 5 – Meningeal congestion in a case of suspected salt toxicity in a pig**

Postmortem examinations were carried out on two, seven-week-old, weaned pigs from a group of 1000 purchased at four weeks of age. Some pigs were ill thriven and seventeen had died over the previous week despite the addition of antibiotics to both feed and water. Both carcasses showed thickened small intestines with extensive serosal haemorrhages, necrotic mucosa, and fibrinous peritonitis. *Salmonella enterica* serotype *typhimurium* was isolated from the liver of both animals and histopathology revealed severe intestinal ulceration, necrosis, and vascular thrombosis consistent with salmonellosis.

### References:

- 1- Burgstaller J, Thaller D, Leeb T *et al* Syringomyelia in a newborn male Simmental calf. *J Vet Intern Med* (2015); 29(6): 1633–7
- 2- Pesavento PA, Dange RB, Carmen Ferreras M *et al* Systemic necrotising vasculitis in sheep in association with ovine herpesvirus 2. *Vet Path* (2019); 56(1):87–92