

### OVERVIEW

- **Closantel toxicity in cattle and sheep**
- **Losses in post-weaned calves due to colisepticaemia**
- **Multiple deaths due to ruminal acidosis following diet change in cattle and sheep**
- **Ataxia and paresis following routine vaccination of sheep**
- **Sea bird deaths as a result of starvation**

### GENERAL INTRODUCTION

September was slightly drier and sunnier than average but was followed by a dull, wet October with 136 per cent of average rainfall and only 80 per cent of average sunshine. November was the fifth warmest on record since 1884 with a mean temperature 1.6 °C above the long-term average.

### DISEASE ALERTS

The following conditions were reported by SRUC VS disease surveillance centres in February 2020. Given similar climatic and production conditions, they could also be important this year.

- **Foetopathy due to Bovine Herpes Virus 1**  
Bovine Herpes Virus 1 is infrequently diagnosed as a cause of bovine abortion. No pathognomic lesions are visible on postmortem examination but identification of multifocal hepatocellular necrosis on histopathology raises suspicions of BoHV1-related foetopathy. The diagnosis is confirmed on PCR testing of liver and/or placenta. It is useful to freeze samples of liver, placenta and spleen in virus transport medium at the time of carcass examination. They are then available if routine screening suggests that further testing is required to achieve a diagnosis.
- **Uterine *Clostridium sordellii* infection in periparturient ewes.**  
*Clostridium sordellii* can be detected in association with fatal metritis in ewes around lambing time. Ascending infection is the probable source and vaginal prolapse may increase this risk. However, *C. sordellii* is also a common postmortem invader of tissues therefore its detection, particularly from autolysed carcasses, is not diagnostic. Histopathology can be invaluable in clarifying the possible significance of bacterial isolates, and tissues should be routinely fixed in formalin if clostridial involvement is suspected. not used by the existing flock may be necessary.

### DISEASE ALERTS

- **Avian tuberculosis in backyard chickens**  
Avian tuberculosis is a differential diagnosis for weight loss in backyard chickens. Granulomas may be found particularly within the intestinal wall, liver and spleen. *Mycobacterium avium* subspecies *avium* can survive for extended periods in the environment posing a risk of infection to other birds. Establishing a new, clean flock on ground not used by the existing flock may be necessary.

### CATTLE

#### Toxic conditions

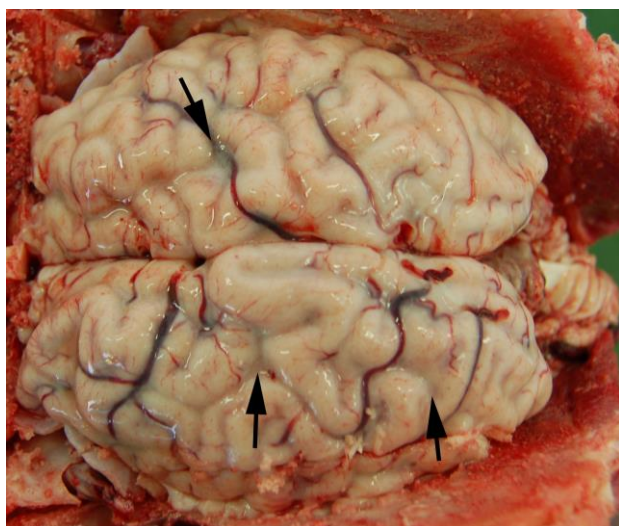
A well grown eighteen-month-old Aberdeen Angus cross heifer was euthanased after becoming dull, blind, ataxic and intermittently recumbent over the preceding 24 hours. There was no response to treatment with NSAIDs and multivitamins. It was the only affected animal from a group of 30 cattle that had been housed in straw bedded shed for two months. All had been treated with 55 to 60 ml of a closantel/ivermectin pour on one week previously. No lesions were detected on postmortem examination but histopathology identified severe widespread angiocentric, subpial and ventricular vacuolar leucoencephalopathy involving pronounced rarefaction of white matter at these sites associated with scattered small spheroid formation. The lesion pattern and distribution were considered consistent with closantel toxicity. Examination of the fixed eyes revealed discolouration of the optic nerve associated with glial and axonal degeneration and also deemed to be typical (Fig 1). SRUC VS advised the case be reported to the Veterinary Medicines Directorate as a suspected adverse reaction.



**Figure 1 – Discolouration of the optic nerve in a case of closantel toxicity**

## Generalised and systemic conditions

Colisepticaemia was diagnosed as the cause of death in seven housed calves from two farms during September. One herd was a dairy unit while the other was a calf finisher. Colisepticaemia is commonly diagnosed in neonatal calves in association with hypogammaglobulinaemia, however these cases were unusual in that the affected calves were aged between one and six months of age, with six of the seven over three months of age. Five of them had purulent meningitis (Fig 2), and two had purulent arthritis. There appeared to be no obvious predisposing factor with no evidence of significant gastrointestinal lesions and no exposure to BVD virus. Isolates from at least two tissues from each calf were tested using analytical profile indexing (API), with a common profile detected in all cases. Whole genome sequencing is underway to assess whether the *E coli* isolates are consistent within and between farms.

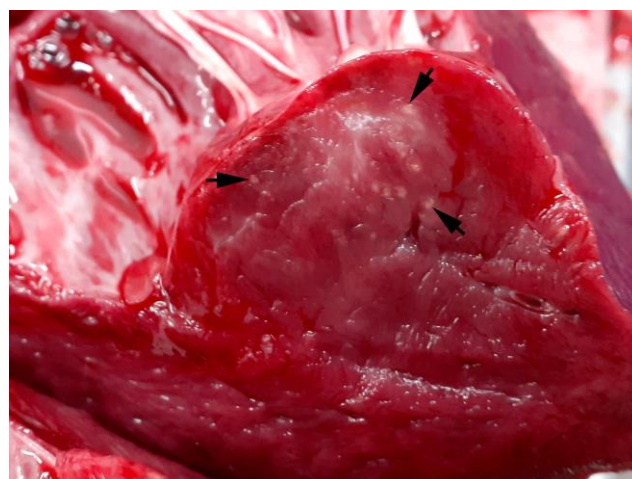


**Figure 2 – Cloudy meninges in a three-month-old calf with colisepticaemia**

A ten-month-old Friesian bull calf was noted to be pale and tachycardic with a swollen tongue prior to death. It was the third to die in a group of 27 calves grazing a silage aftermath over a period of two weeks. Postmortem examination found that the tongue was grossly enlarged with black muscle and small gas bubbles evident on section. Submandibular oedema and haemorrhage were also apparent and airway diameter was reduced due to swelling of the laryngeal mucosa. *Clostridium septicum* was cultured from the tongue and histopathology was consistent with a clostridial myositis/glossitis. *C septicum* is the main cause of malignant oedema and pseudoblackleg. In these cases the lesions can be dominated by oedema and gas

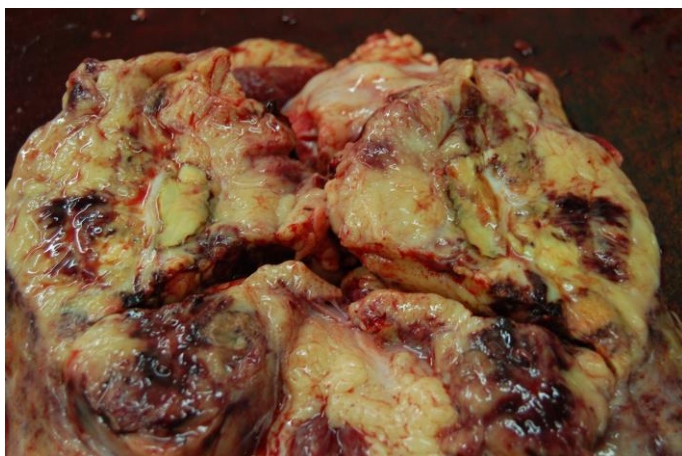
formation with only minimal neutrophils and bacteria present.

Six animals from five beef herds, ranging in age from six to 15 months, were diagnosed with *Histophilus somni* septicaemia. Three animals were found dead; one was noted to be dull before it rapidly deteriorated and died; respiratory signs were reported in another; and the sixth displayed neurological signs prior to death. Postmortem examination revealed lesions within the left ventricular papillary muscle (Fig 3) in five of the six cases. This is a known predilection site for *H somni*. Arthritis and meningitis were detected in the sixth animal. Lesions consistent with *H somni* septicaemia were detected on histopathology. *H somni* was not isolated on culture from any carcase but PCR testing detected *H somni* DNA in all cases. These cases illustrate the importance of not relying solely on bacteriology when *H somni* infection is suspected.



**Figure 3 – Multiple small foci of necrotising myocarditis (arrows) in the left ventricular papillary muscle.**

A two-year-old belted Galloway heifer at grass was noted to be off colour and standing away from the rest of the group. Closer examination revealed salivation and mild pyrexia. The heifer was housed but became sternally recumbent with an extended head and neck and was euthanased four days after becoming ill. Postmortem examination detected subcutaneous oedema along the ventral neck and a 30 x 20 cm mass extending cranially from the thoracic inlet. The mass was very firm with areas of necrosis on section (Fig 4). Histopathology confirmed lymphosarcoma, and the site was consistent with origin from the cervical thymus. There was no suspicion of enzootic bovine leukosis in this case.



**Figure 4 – Lymphosarcoma in a belted Galloway heifer**

### Alimentary tract disorders

Acute ruminal acidosis was diagnosed as the cause of death in two adult cows that were submitted following the death of 13 cattle over a 24-hour period. The rumen pH was 3.9 in one and 4 in the other, confirming the diagnosis. The losses occurred in a shed of 150 fattening cattle comprising 90 bullocks and 60 cows two days after being allowed ad-lib access to an oxytetracycline medicated feed. The cattle had prior access to a total mixed ration and had been in good health and eating well before introduction of the hard feed, which contained alkali treated barley which has a naturally high pH. The possibility of the combination of oxytetracycline and the alkali treated feed causing an increased acidosis risk was discussed, and while an interaction cannot be completely excluded it was considered unlikely. An increased risk of acidosis is not reported in the United States where inclusion of oxytetracycline in finisher rations is extremely common. All changes of feed should be managed carefully.

### Respiratory tract diseases

A five-month-old Aberdeen angus cross calf was housed with its dam and fifty other cows and calves three weeks prior to its death. Three calves died and three were reported to be off colour two days after being handled for administration of the first dose of a *Mannheimia haemolytica*/respiratory syncytial virus/parainfluenza 3 vaccine plus an intramuscular IBR vaccine. Postmortem examination confirmed a severe tracheitis (Fig 5) and extensive bilateral lung consolidation affecting around 80 per cent of the tissue. Bovine herpes virus type 1 was detected from both the trachea and lung by PCR and a pure growth of *Histophilus somni* was cultured from the lung. Histopathology confirmed a severe necrotising tracheitis and bronchointerstitial pneumonia consistent

with bovine herpesvirus infection plus bacterial bronchopneumonia. The findings indicated that the timescale for development of the IBR related pathology was greater than two days. A group of 12 to 18-month-old cattle had been purchased one month earlier and were a possible source of virus.



**Figure 5 – Necrotic tracheitis due to infection with bovine herpes virus 1**

### Nervous system disorders

A three-year-old Aberdeen angus cow was found in lateral recumbency at grass and was described as dull and uncomfortable with twitchy eyes. It was euthanased after failing to respond to treatment with calcium, magnesium and NSAIDs. The group had been set stocked since spring and straw had been introduced during the previous three weeks. Despite good body condition postmortem examination detected evidence of parasitic abomasitis and Johne's disease. Neuropathology identified cerebrocortical necrosis which is an unusual diagnosis in an adult cow. It was suggested that the diet change along with impaired absorption associated with gastrointestinal disease may have predisposed to the cerebrocortical necrosis.

## SMALL RUMINANTS

### Nutritional and metabolic disorders

A mob of 550 store lambs were turned onto a barley stubble field immediately after purchase and ten animals died over the following ten days. Some were found dead but others were described as weak, diarrhoeic and ataxic. Four carcasses were examined and the rumens were found to contain wet fibrous digesta with moderate amount of barley. Rumen pH results of between 3.8 and 4.5 confirmed a diagnosis of acidosis. The same diagnosis was reached on a second holding where 23

lambs from a group of 650 died over a three-day period after the group were moved from kale onto a stubble field. Ideally animals should be introduced gradually to stubble fields and the area checked for grain spills. A source of long fibre should also be provided.

### Toxic conditions

Two, five-month-old lambs were noted to be blind and pyrexia and were euthanased for investigation of the problem. There were no significant findings on postmortem examination. Examination of the fixed eyes revealed greyish discolouration of the cut surfaces of the optic nerve in lamb 1 and pronounced decrease in diameter of the optic nerve and optic chiasm in lamb 2. Histopathology of the brain and eye revealed a multifocal retinopathy in both lambs together with pronounced axonal and myelin degeneration in lamb 1 and extensive gliosis of the optic disc/nerve in lamb 2. A subpial and subependymal leucoencephalopathy was present in lamb 1. The lesions were typical of closantel intoxication in both lambs, being of longer duration in lamb 2. Examination of the eye and optic nerve is essential for the histological confirmation of chronic closantel toxicity.

### Generalised and systemic conditions

Six lambs were found dead in two weeks following purchase of 200 store lambs. The group had been treated with moxidectin 2 per cent, injected at the base of the ear, on arrival from the market. The carcass of a four-month-old Suffolk cross was submitted as representative of the problem. Severe fasciitis and myositis with an associated haemorrhagic foul-smelling exudate were found in the left neck. The area of necrosis extended from the base of the left ear down to the angle of jaw, and caudally as far as the muscular attachment of the scapula. The findings were considered to be consistent with unhygienic and inaccurate injection technique. The farmer had noted that the animals had been wet and quite dirty when they were treated.

### Reproductive tract conditions

Two blue face Leicester tup lambs were presented for euthanasia and postmortem investigation of severe epididymitis. The affected lambs had been housed with seven others on clean, dry straw for two weeks and excessive mounting behaviour had not been observed. Clinical signs had first been noticed two days earlier when both animals appear to be in pain and were slow to rise. This was a recurring problem with similar cases seen during the preceding two years. In both cases bilateral haemorrhage and oedema was found within the tunic of the testes and epididymides. Urinalysis was unremarkable and cultures were unrewarding. No

evidence of *Histophilus somni* was detected on PCR. Histopathology confirmed acute haemorrhage and oedema within the spermatic cord, epididymis and testicle with only scant neutrophils detected. No specific evidence of an infectious cause was identified but it was advised that tup lambs be kept in small groups at grass, moving field regularly.

### Nervous system disorders

Two flocks reported issues due to poor injection technique following administration of a *Dichelobacter nodosus* vaccine. Five Scottish blackface ewe hogs from a group of 180 were found recumbent at grass. The group had been weaned six weeks previously and were described as being less lively than before. They had been vaccinated behind the ear approximately two weeks earlier and handled to have their ventral abdomens clipped one week later. Evidence of opisthotonos was reported and some affected animals were believed to be blind. Cerebrocortical necrosis was suspected and treatment with vitamin B1 had been attempted but was unsuccessful. One hogg was examined prior to euthanasia and no cranial nerve deficits were detected. Proprioceptive reflexes were present in all four limbs, but it was unable to bear weight. Significant lung consolidation was identified at postmortem examination and *Mannheimia haemolytica* was isolated but considered to be a secondary issue. No ticks were seen and there was no evidence of an injection site reaction. The brain and spinal cord were examined but no visible lesions were found. Histopathological examination of multiple transverse sections of the cervical spinal cord located a severe focal lesion in the ventral white matter with a symmetrical distribution mainly characterised by spheroids. This was considered to be consistent with a traumatic event such as needle penetration of the vertebral canal at the time of vaccination inducing a slowly developing inflammatory response. Earlier more subtle clinical signs may have been missed and would have developed very rapidly had the vaccine itself been injected.

Eight animals from a group of 180 gimmers showed varying degrees of ataxia two to four days after being vaccinated. One animal became recumbent and was submitted for postmortem examination. Firm yellow gelatinous material was found ventral to and extending into the atlanto-occipital joint (Fig 6) and vertebral canal causing compression of the spinal cord. *Streptococcus uberis* was isolated in mixed growth from this area. A ewe from a second holding became recumbent two weeks after administration of the same vaccine. Evidence of myositis and microabscessation was detected in the caudal oblique muscle and purulent material was present around the atlanto-axial joint.

Spinal cord compression at this site was confirmed on histopathology. Injection site reaction was diagnosed as the cause of the clinical signs in both cases. These cases illustrate the importance of adequate restraint and hygienic injection technique when administering vaccines to sheep. Vaccinators should be aware of the correct injection site and the potential consequences of a lack of precision.



**Figure 6 – Septic arthritis of the atlanto-occipital joint secondary to routine vaccination**

Three animals from a group of 250 fattening lambs were found dead over the course of a few days. A fourth lamb was noted to be blind, head pressing and grinding its teeth and was euthanased for investigation of the problem. No abnormalities were detected on postmortem examination however the recovery of 15000 *Teladorsagia* sp. from the abomasum was considered potentially significant despite good body condition. Neuropathology detected vacuolation suggesting a metabolic/toxic cause for the clinical signs as observed in cases of renal/hepatic encephalopathy. However, clinical biochemistry indicated that liver and kidney function was normal, and histopathology of these tissues was unremarkable. In sheep, the presence of vacuolar leucoencephalopathy is most commonly associated with gastrointestinal disease suggesting parasitic gastroenteritis as the trigger in this case. The pathogenesis is unclear but has been suggested to involve hyperammonaemia in horses.

## PIGS

### Generalised systemic diseases

A second parity landrace cross sow was reported to be anorexic for three days prior to farrowing 24 to 48 hours prematurely. Five piglets were stillborn and 12 were born alive but developed skin lesions and died soon after birth. Dark purple discolouration and subcutaneous oedema affected the distal limbs of the piglets, with a sharp

demarcation between these areas and normal tissue (Fig 7). Similar, albeit more focal, skin changes were seen around the tail base and head. Histopathological examination identified severe cutaneous haemorrhage and cellulitis plus pneumonia, nephritis and meningitis. *Pasteurella multocida* was isolated from the lung in all cases and it was considered that haematogenous spread to the piglets had occurred pre-natally following septicaemia in the sow. The sow was also necropsied after deteriorating despite treatment with antibiotics and NSAIDs. This confirmed severe acute necrotising bacterial-type pneumonia and pleurisy and histopathology revealed additional chronic underlying lung changes. *Pasteurella multocida* and *Trueperella pyogenes* were isolated from the lung. All isolates of *P. multocida* had identical antimicrobial sensitivity results and were sensitive in vitro to the antibiotic used. Sequencing of the strains is currently being undertaken for further comparison.



**Figure 7 – Distal limb discolouration in neonatal piglets with *Pasteurella multocida* septicaemia**

## BIRDS

### Game birds

A grouse was submitted after it was found unable to fly. Counts of viable young birds had been dropping despite an initial good count of six to seven young per brood at hatching in May and concerns were raised over poor feed availability due to heather beetle infestation. The carcass was emaciated, ticks were observed and both cestode and nematode worms were found in the intestinal tract. A positive louping ill antibody titre was detected in the absence of a non-suppurative encephalitis. However, it was considered likely that louping ill could have been contributing to the losses in addition to parasitism and under-nutrition.

## Wild birds

Members of the public reported finding large numbers of dead sea birds washed up on the Ayrshire and Solway coasts. Carcasses were submitted from two different locations and a total of ten razorbills (*Alca torda*) and five guillemots (*Uria aalge*) were examined. In all cases the birds were in very poor body condition with prominent sternums and no body fat. No food material was present within the digestive tracts. A tangled ball of slightly elasticated flattened plastic thread was found in the gizzard of one guillemot where it was causing an impaction. Small quantities of the same material were present in the gizzard of one razorbill and one other guillemot. Routine surveillance for salmonella and avian influenza proved negative and starvation was recorded as the cause of death. Large numbers of sea birds can die in incidents known as “wrecks” which can be associated with poor weather conditions offshore. Storms had occurred in the Atlantic in the weeks prior to carcass submission.

A juvenile male chaffinch (*Fringilla coelebs*) was observed looking ill with a fluffed-up appearance and was found dead in a garden later the same day. Postmortem examination revealed that the oesophagus was distended with food to the level of the thoracic inlet. Once this was removed multiple caseo-necrotic plaques were visible on the mucosa of the distal oesophagus/crop (Fig 8). Screening for salmonella proved negative and histopathology confirmed a diagnosis of trichomonosis. The UK chaffinch population is reported to have fallen by 27 per cent over the last ten years and it is likely that trichomonosis is contributing to this.<sup>1</sup>



**Figure 8 – Trichomonosis lesions in the upper digestive tract of a chaffinch**

## References:

1 Harris SJ, Massimino D, Balmer DE *et al.* The Breeding Bird Survey 2019 BTO Research Report 726 British Trust for Ornithology, Thetford (2020) Available online: <https://www.bto.org/sites/default/files/publications/bbs-report-2019.pdf> (Accessed 17/12/20)