OVERVIEW
- Meningioangiomatosis in a heifer calf with hindlimb paralysis
- Arnold-Chiari-like malformation in a neonatal suckler calf
- Louping ill and pasteurellosis contribute to over 10 per cent mortality in one flock
- Cryptosporidiosis causes sinusitis in a red grouse
- *Dermanyssus* mite infestation in a dog

GENERAL INTRODUCTION
September saw cooler and unsettled weather in the middle part of the month being sandwiched by warmer and more benign conditions. This made for an overall warm and dry month, particularly in Aberdeenshire.

SAC Consulting: Veterinary Services (SAC C VS) issued a warning to farmers in the Caithness area following an increase in the incidence of *Clostridium chauvoei* disease, also known as blackleg. The reason for the increase was unknown however farmers were recommended to investigate any unexpected deaths and discuss the merits of vaccination with their vet.

CATTLE

Toxic conditions
Ayr diagnosed yew poisoning as the cause of four sudden deaths in a group of 25 youngstock aged approximately 18 months. Examination of two submitted carcases found unidentified seeds in the abomasum of both animals. This prompted an inspection of the field boundaries which found discarded yew tree clippings that had been trampled by cattle. Closer assessment of the rumen contents subsequently identified plant material consistent with yew tree clippings. The seeds which had triggered the field inspection were suspected to be from brambles that were also growing in the field. Screening for lead proved negative and vitreous humour magnesium values were within the reference range. Following this report NFU (Scotland) issued a press release urging the public to dispose of clippings and trimmings safely.

Parasitic diseases
Sixteen outbreaks of parasitic pneumonia were diagnosed across Scotland, twice as many as in September last year. In one Aberdeenshire outbreak acute interstitial pneumonia due to lungworm re-infection was the cause of sudden death in a 14-month-old, Limousin-cross heifer in an organic suckler herd. The group had not received any anthelmintic treatment and there was evidence of coughing when they were handled. At necropsy, *Dictyocaulus viviparus* worms were found in the trachea and distal airways; interlobular oedema was evident. Histopathology confirmed the diagnosis. A concurrent strongyle egg burden of 10,600 eggs per gram was detected in caecal contents. Anthelmintic treatment of the cohort was recommended.

Nervous system disorders
Two unusual spinal cord disorders were identified by Perth this month. Meningioangiomatosis was diagnosed in a four-month-old beef shorthorn heifer calf with hindlimb ataxia that was euthanased on welfare grounds after becoming recumbent with one hindlimb fixed in extension. Splitting the spinal column revealed haemorrhage and disruption to the spinal cord over the pelvis, with a proliferative mass forming a grossly visible plaque that invaded the adjacent neural parenchyma. Histological changes were consistent with meningioangiomatosis, a very rare condition observed in humans, dogs and horses.

An unusual Arnold-Chiari-like malformation was seen in a neonatal calf from a Simmental-cross heifer. The calf was born alive with a large skin defect across the dorsum at the level of the lumbar vertebrae, no tail, a stiff neck and knuckled forelimbs. Necropsy revealed subcutaneous bruising and haemorrhage over the lumbar dorsum with a small hole directly above the lumbar vertebrae into which the subcutaneous tissues folded, forming a small pouch. Examination of the vertebral column revealed a gap between L2 and L3 vertebræ into which there was an out-pouching of the dura mater continuous with the subcutaneous defect.

![Figure 1 – Gap between L2 and L3 allowing outpouching of the dura mater in a calf with Arnold-Chiari-like malformation](image-url)

**Figure 1** – Gap between L2 and L3 allowing outpouching of the dura mater in a calf with Arnold-Chiari-like malformation
Mild right-sided scoliosis of the cervical vertebrae and a widening of the atlanto-occipital joint were seen, with the cerebellum sitting within the joint space. The brain was structurally abnormal with no clear distinction between the two hemispheres in the cranial cerebrum. Neuropathological examination of this brain showed bilaterally symmetrical caudal elongation of both occipital lobes over the cerebellum, and confirmed that one of the hemispheres was not fused as would normally be expected. The cerebellum and ventricular system were not normally developed. SAC C VS commented that similar findings were described in Arnold-Chiari-like malformation in calves. This complex deformity of the caudal brain stem and cerebellum can be associated with spinal cord malformations such as spina bifida or meningomyelocele. This case was likely to be a sporadic occurrence.

Dumfries diagnosed cerebrocortical necrosis (CCN) in a four-month-old weaned Limousin-cross calf that was grazing lush re-seeded pasture. This was the fourth calf in the batch to display neurological signs including blindness and bruxism. Two of the calves had died, one appeared to respond to treatment with antibiotics and the fourth was euthanased for necropsy. SAC C VS postulated that grazing the lush re-seeded pasture had altered the rumen flora permitting the multiplication of thiaminase-producing organisms. An increase in dietary fibre was advised to encourage the production of volatile fatty acids that would curtail the growth of thiaminase-producing organisms.

Respiratory tract diseases
*Mycoplasma bovis* was implicated in the deaths of two animals of different ages from the same holding. The carcases of a four-month-old calf and a one-year-old stirk were submitted to Ayr from a calf rearing / finishing unit that purchases dairy-bred calves at three weeks of age from multiple sources. The younger calf was from a batch of 15 that had all been treated for pneumonia in the previous week. Necropsy revealed consolidation of approximately 70 per cent of lung tissue and *Histophilus somni* and *Bibersteinia trehalosi* were recovered from the lesions. Serum collected at necropsy was positive for antibodies to *M. bovis*. The older animal was from a pen seeded pasture. This was the fourth calf from multiple sources. The younger calf was from a batch to display neurological signs including blindness and bruxism. Two of the calves had died, one appeared to respond to treatment with antibiotics and the fourth was euthanased for necropsy. SAC C VS postulated that grazing the lush re-seeded pasture had altered the rumen flora permitting the multiplication of thiaminase-producing organisms. An increase in dietary fibre was advised to encourage the production of volatile fatty acids that would curtail the growth of thiaminase-producing organisms.

Reproductive tract conditions
An unusual diagnosis of foetopathy due to *Aspergillus niger* was made in a dairy heifer that aborted approximately six months into gestation. Examination of the placenta identified a circular thickened lesion, tan in colour and seven centimetres in diameter. *A. niger* was recovered from the lesion and from foetal lung and stomach contents. Mycotic abortions occur sporadically in cattle but outbreaks can occur if animals are given feeding of poor quality. Most commonly *Aspergillus fumigatus* is recovered from such cases but overheating of feed can allow other *Aspergillus* species such as *A. niger* to proliferate.

**SMALL RUMINANTS**

Toxic conditions
St Boswells diagnosed metaldehyde toxicity in a ewe that was shaking and ataxic prior to death. Six ewes died over three days before a carcase was submitted for necropsy. Examination found a large number of small, blue, cylindrical pellets throughout the rumen contents; the ileal content was blood stained. Subsequent searches found an open bag of the slug pellets in the corner of the field being grazed.

**Respiratory tract diseases**
*Mycoplasma bovis* was implicated in the deaths of two animals of different ages from the same holding. The carcases of a four-month-old calf and a one-year-old stirk were submitted to Ayr from a calf rearing / finishing unit that purchases dairy-bred calves at three weeks of age from multiple sources. The younger calf was from a batch of 15 that had all been treated for pneumonia in the previous week. Necropsy revealed consolidation of approximately 70 per cent of lung tissue and *Histophilus somni* and *Bibersteinia trehalosi* were recovered from the lesions. Serum collected at necropsy was positive for antibodies to *M. bovis*. The older animal was from a pen seeded pasture. This was the fourth calf from multiple sources. The younger calf was from a batch to display neurological signs including blindness and bruxism. Two of the calves had died, one appeared to respond to treatment with antibiotics and the fourth was euthanased for necropsy. SAC C VS postulated that grazing the lush re-seeded pasture had altered the rumen flora permitting the multiplication of thiaminase-producing organisms. An increase in dietary fibre was advised to encourage the production of volatile fatty acids that would curtail the growth of thiaminase-producing organisms.

Reproductive tract conditions
An unusual diagnosis of foetopathy due to *Aspergillus niger* was made in a dairy heifer that aborted approximately six months into gestation. Examination of the placenta identified a circular thickened lesion, tan in colour and seven centimetres in diameter. *A. niger* was recovered from the lesion and from foetal lung and stomach contents. Mycotic abortions occur sporadically in cattle but outbreaks can occur if animals are given feeding of poor quality. Most commonly *Aspergillus fumigatus* is recovered from such cases but overheating of feed can allow other *Aspergillus* species such as *A. niger* to proliferate.

**Nutritional and metabolic disorders**
Perth diagnosed cobalt deficiency in a group of Lleyn hoggs which were 10kg lighter than similar animals on a different pasture. There was no response to anthelmintic treatment. Serum vitamin B12 levels were low in all six samples with a mean value of 132.5 pmol/l (marginal band 336-500 pmol/l). Selenium and copper levels were adequate.
Cobalt and selenium deficiency with concurrent teladorsagiasis was diagnosed in a five-month-old texel cross ewe lamb submitted to Dumfries for investigation of ill thrift in a group of 50 lambs. The lambs were in good condition at weaning but after four weeks 25 per cent of the group were described as very poor despite grazing good grass. Worming was carried out five weeks previously with oral ivermectin. At necropsy Teladorsagia sp. worms were visible in the abomasum and 7,450 were recovered. Liver copper content was adequate however both cobalt and selenium were very low being 0.02mg/kg DM (reference range > 0.06mg/kg DM) and 0.16mg/kg DM (0.9-3.5mg/kg DM) respectively. SAC C VS advised that both selenium and cobalt supplementation was justified along with further anthelmintic treatment.

**Generalised and systemic conditions**

*Bibersteinia trehalosi* septicaemia secondary to tick borne fever was suspected to be the cause of death of two, five-month-old Scottish blackface lambs submitted to St. Boswells. Ticks were found in the axillae of both lambs and there was splenomegaly in both cases. One lamb had an excess of discoloured synovial fluid in the stifle and elbow joints and gross evidence of meningitis. *Bibersteinia trehalosi* was isolated from the meninges and joints of this lamb and from the lung and liver of the other.

**Cardiovascular diseases**

Cardiac failure was responsible for the death of a four-year-old blackface ewe that was slow when gathered and subsequently died a week later. Necropsy at Dumfries identified a serous, bilateral pleural effusion with an increased volume of pericardial fluid surrounding an enlarged heart. White areas and speckles were found within the myocardium with accompanying lung oedema and hepatomegaly.

Cultures of the heart remained sterile and histopathology confirmed that the lesions were due to end stage myocardial fibrosis secondary to necrosis. SAC C VS suggested that a bacteraemia and myocarditis had occurred around lambing time resulting in the observed lesions.

**Musculo-Skeletal conditions**

A flock reported 16 texel cross lambs with green staining around their mouths due to salivation, six of which also displayed weight loss and lumps on their jaws. Necropsy at Dumfries found swelling of the caudal body of the left mandible. No pharyngeal injuries were obvious. Instead, a two centimetre sliver of necrotic bone was found adjacent to the lateral mandible with thickening of the associated periosteum. A pure growth of *Bibersteinia trehalosi* was isolated from the site with *Bacteroides* sp. recovered on anaerobic culture. SAC C VS suggested that traumatic damage to the mandible, perhaps associated with passage through the handling pens, had lead to the formation of a bony sequestrum.

**Nervous system disorders**

Louping ill and pasteurellosis were identified as contributors to the deaths of at least 15 Cheviot cross lambs and ewes from a group of 120 ewes with lambs at foot. Concurrent tick borne fever involvement could not be ruled out. A mixture of sudden deaths and rapid onset neurological signs or malaise was reported before four, four-month-old lambs and a ewe were submitted to Perth for examination. Ticks were present on all animals and one lamb, submitted live, was blind. Neuropathology of this lamb revealed a very acute non-suppurative meningoencephalitis consistent with louping ill. Three sheep were seropositive for antibodies to louping ill, with two showing a predominance of IgM consistent with recent infection. *Bibersteinia trehalosi* was isolated in systemic distribution from one lamb with pulmonary infection.

![Figure 3 - Myocardial discolouration in a Blackface ewe with cardiac failure](image)

![Figure 4 - Two centimetre sliver of necrotic bone adjacent to the lateral mandible in a lamb with dysphagia](image)
congestion. The group had been moved onto new rented grazing earlier in the summer and this was considered significant in the outbreak.

Dumfries identified cerebral abscessation in a five-month-old lamb that was hunched with low head carriage of five days’ duration. The lamb made no attempts to walk; the menace response was absent on the right and poor on the left. Large bilateral cerebral abscesses containing green pus were found at necropsy, with bacterial cultures yielding growths of *Escherichia coli* and *Fusobacterium necrophorum*. There were no abscesses elsewhere in the carcass and the source of infection was unknown.

Figure 5 – Bilateral cerebral abscesses in a five-month-old lamb

Parasitic diseases

Coccidiosis was confirmed in a four-month-old lamb that became dull and bloated with haemorrhagic diarrhoea for a short period prior to death. It was one of a group of 80 store lambs purchased two weeks previously that were housed for quarantine treatments before being turned out onto good quality reseeded grass and clover. Necropsy at Edinburgh revealed typhlocolitis and a large intestinal burden of 68,400 coccidial oocysts per gram. Histopathology confirmed the presence of severe mucosal damage associated with coccidial forms. Coccidiosis is most common in four to eight week old lambs but can be seen at weaning, particularly if lambs are moved onto heavily contaminated grazing.

Aberdeen diagnosed nematodirosis as the cause of death of two, five-month-old cross-bred tup lambs. Five deaths occurred, some of which were preceded by dark diarrhoea. At postmortem examination there was faecal staining of the perineum and the large intestinal contents were watery. Gut washes were performed on both lambs and large numbers of *Nematodirus battus* worms were identified in each case, along with elevated faecal Nematodirus egg burdens. The group had been treated with albendazole at weaning three weeks previously.

**Review of Johnne’s disease diagnoses in sheep**

Although the last 20 years have seen an increase in diagnoses of bovine Johnne’s disease (as a percentage of diagnosable submissions) the figures for sheep have remained static. While this may accurately reflect disease incidence, lack of time or interest, distance, cost and low animal value may have created barriers to investigation. Furthermore, a perceived lack of benefit due to the difficulty in applying practical control solutions could also be an issue. These factors are especially pertinent given that a high proportion of diagnoses are made in hill breeds. The retention of homebred replacements in these flocks will allow perpetuation and potential escalation of the disease. Typically diagnoses peak between September and March with poor winter nutrition likely to be playing a role in disease becoming apparent. Investigation should focus on ewes that fail to gain weight after weaning and thin, barren ewes at scanning time.

![Graph showing diagnoses of Johnne's disease in cattle (red) and sheep (green) between 1993 and 2013](image)

Postmortem examination has the advantage of allowing pigmented and non-pigmented cases of Johnne’s disease to be distinguished. This is important because non-pigmented or type 2 strains are more likely to spread between cattle and sheep. Pigmented, or type 1, strains are sheep associated and very rarely infect cattle. Pigmented strains appear to be most common in the south west of Scotland with non-pigmented strains predominating in the southeast and Perthshire. Ovine Johnne’s disease is rarely diagnosed in our Inverness and Aberdeen laboratories. In addition to ELISA testing a PCR is now validated for use on sheep faeces which will improve diagnostic sensitivity.
Part-funded by the Scottish Government as part of its Public Good Veterinary Advice Services

Figure 7 – Pigmented form of Johne’s disease affecting the ileum of an adult ewe

PIGS

Alimentary tract disorders

Rotavirus was the likely cause of an on-going scour problem in housed piglets of 14 to 21 days of age on a breeding to finishing unit. The scour was watery and yellow. Affected pigs failed to thrive once diarrhoea ceased. A typical case was euthanased and submitted for necropsy. Yellow coloured pasty to fluid caecal and colonic contents were confirmed with no significant organisms detected on bacterial culture. Polyacrylamide gel electrophoresis (PAGE) screening was positive for rotavirus.

Intestinal torsion was suspected as the cause of death of a four-month-old pig that died suddenly. On-farm necropsy was performed as eight pigs from a group of 238 on the finishing unit were found dead over the previous two weeks. The cohort was noted to be of uneven sizes with many gaunt, pale and hairy pigs. Necropsy revealed areas of distended haemorrhagic intestine but did not record if there was any evidence of torsion. Two sections of jejunum submitted to Aberdeen showed marked congestion, oedema and haemorrhage of the mucosa and submucosa through to the serosa. Fluid blood-stained contents were present in the lumen. Salmonellae were not isolated in cultures and Brachyspira hyodysenteriae and Lawsonia intracellularis were not detected by PCR.

BIRDS

Poultry

Several different causes of death were found in two batches of pure-bred pullets purchased from the same sale. Respiratory tract pathology, suspected to be due to infectious bronchitis and mycoplasmosis, was found in six birds. One thin bird had died from a gizzard impaction, with long fibre in the gizzard and a rope-like mat of fibrous material at least 30cm long and 5cm in diameter in the outflow of the gizzard. A further bird was very fat and had died from fatty liver syndrome. Menacanthus species biting lice were also present.

Game birds

Pulmonary aspergillosis was diagnosed in eight-week-old pheasants. 12 deaths associated with weight loss, lameness and frothy faeces occurred in a pen of 200 birds purchased two weeks previously. No motile protozoa were seen however histopathology confirmed marked pulmonary congestion and multifocal pulmonary abscessation associated with septate and branching fungal hyphae consistent with Aspergillus species. Cryptosporidiosis was diagnosed in a red grouse with a swollen head that was exhibiting unusual behaviour. At necropsy the head was grossly swollen, causing closure of one eye. Incision of the infraorbital sinus released several millilitres of clear, mucoid fluid. Smears made from the sinuses identified cryptosporidia in large numbers and histopathology revealed chronic active conjunctivitis and sinusitis associated with heavy cryptosporidial colonisation of the mucosa. Conjunctivitis and sinusitis has previously been associated with Cryptosporidium baileyi infection. Mycoplasma pullorum was also isolated from this case however it was not considered to be of major significance.

Wild birds

Presumed trichomonosis was diagnosed in chaffinches (Fringilla coelebs) from one location. Larval and nymphal ticks, subsequently identified as Ixodes ricinus, were also found on the three submitted birds. Immature stages of I. ricinus are the commonest ticks found on passerine birds, such as chaffinches, in Scotland. SAC C VS suggested that a reduction in vigour and activity caused by the trichomonosis made it easier for the ticks to find a host.

MISCELLANEOUS

Rabbits

Rabbit viral haemorrhagic disease was implicated in the deaths of seven wild rabbits over a four week period on a sporting estate. The rabbits were all around four to six weeks of age and showed no signs of illness or injury when found. One carcase submitted to Edinburgh for necropsy showed no gross abnormalities and bacterial cultures yielded only mixed growths. Faecal analysis identified a parasite burden of 300 strongyle-type eggs per gram and 19,200 coccidial oocysts per gram. Histopathology revealed hemithoracic profiles in the large intestinal lumen and mild damage due to coccidiosis in the mucosa, however it also found multifocal coagulative hepatic necrosis with minimal cellular response. This change was consistent with rabbit viral haemorrhagic
disease and subsequent electron microscopy was positive for calicivirus, confirming the diagnosis.

**Dogs**

An unusual *Dermanyssus* mite infestation was diagnosed in a two-year-old Labrador retriever which presented with generalised pruritus and alopecia. Mites were found by the examining veterinary surgeon and were submitted to Perth for identification. The mites were *Dermanyssus* species and SAC C VS commented that although these mites usually infest poultry, dogs may be occasional accidental hosts. Investigation into the possibility of recent contact with poultry or poultry accommodation was recommended, not least due to the indication that any in-contact birds may have the same condition.

---

**Disease Alerts**

The following conditions were reported by SAC C VS disease surveillance centres in December 2012. Given similar climatic and production conditions, they could also be important this year:

1. Pneumonia in housed calves due to viral and bacterial pathogens
2. Chronic fasciolosis in youngstock and adult cattle
3. Neonatal enteritis in late-autumn born calves
4. Fasciolosis in lambs and ewes often with concurrent parasitic gastroenteritis