

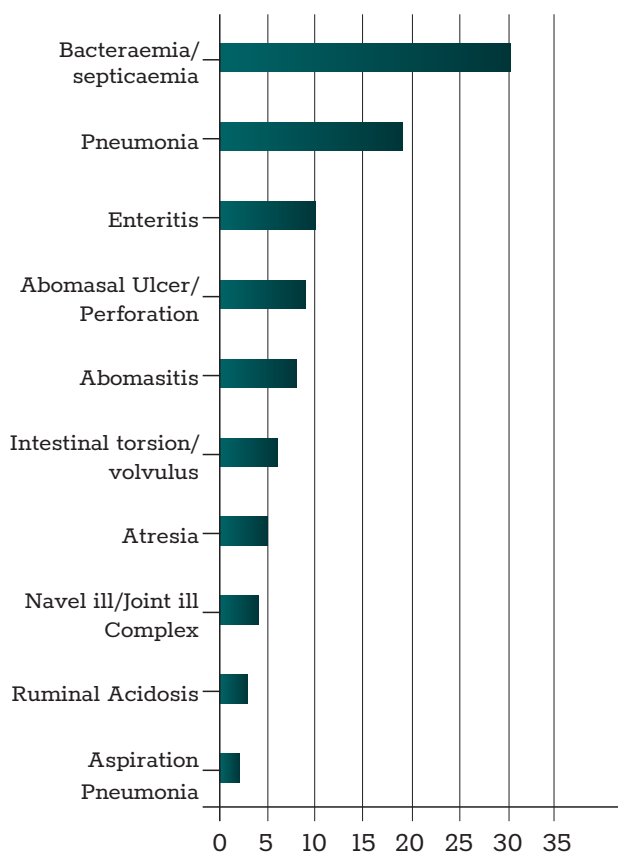
# Regional Veterinary Laboratories Report

February 2023

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 598 carcasses and 279 fetuses during February 2023. Additionally, 1,952 diagnostic samples were tested to assist private veterinary practitioners with the diagnosis and control of disease in food-producing animals. This report describes a selection of cases investigated by the Department of Agriculture, Food and the Marine's (DAFM) veterinary laboratories in February 2023. The objective of this report is to provide feedback to veterinary practitioners on the pattern of disease syndromes at this time of the year by describing common and highlighting unusual cases. Moreover, we aim to assist with future diagnoses, encourage thorough investigations of clinical cases, highlight available laboratory diagnostic tools and provide a better context for practitioners when interpreting laboratory reports.

## CATTLE

Bacteraemia/septicaemia and pneumonia were the most common diagnoses at necropsy in cattle in the RVLs during February 2023.



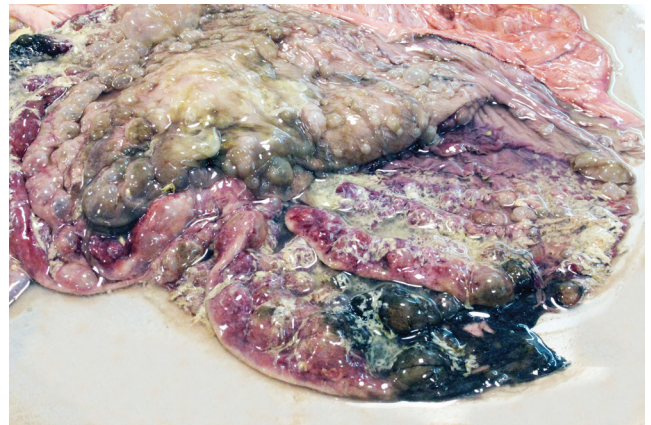
**Table 1: The most common diagnoses in cattle submitted for necropsy in February 2023.**

## GASTROINTESTINAL TRACT

### Abomasal bloat

Athlone RVL examined a one-month-old calf with a history of having developed diarrhoea four days previously. It received treatment with probiotics, developed bloat three days later, and died. Its body condition was poor, weight 38.5kg. There

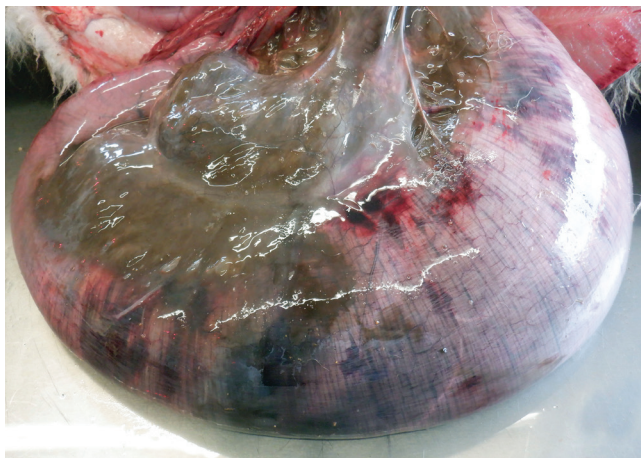
was mild dehydration and moderate abdominal distension. The abomasal mucosa was hyperaemic and emphysematous, and a section of the abomasal serosa and mucosa was black. The small intestines were distended and there was scant faeces. Tests for *Clostridium perfringens* toxins on the abomasal contents were negative. Histopathology of the abomasum showed the abomasal submucosa was expanded by focally extensive areas of congestion, haemorrhage and oedema. Within the sloughed superficial mucosa and in the submucosa were multifocal aggregates of bacteria forming packets or tetrameres with a morphology consistent with *Sarcina* sp.



**Figure 1: Emphysematous abomasitis in a calf; histopathology detected the involvement of *Sarcina* sp. Photo: Denise Murphy.**

*Sarcina* spp. have been associated with abomasal bloat in young lambs and calves, particularly in artificially fed animals. The risk factors are not fully understood but poor hygiene or soil contamination of the milk can contribute. Contributory factors believed to be associated with the development of abomasal bloat and abomasitis in calves include delayed abomasal transit time, the presence of microbes capable of fermentation and the availability of an easily fermentable substrate. Some of the risk factors believed to delay abomasal emptying, thereby facilitating exuberant fermentation, potential toxin elaboration and gaseous production, include feeding either hypo- or hyper-osmolar solutions, large volume feeds (>2.5-3L), incorrect temperatures, erratic feeding

schedules, poor water availability and inconsistent mixing. The importance of methodical, regular and effective cleaning protocols for feeding equipment are also paramount.



**Figure 2: Abomasal bloat. Photo: Maresa Sheehan.**

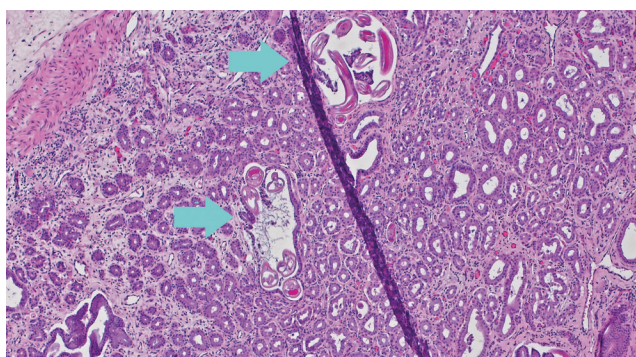
A number of calves are submitted to Kilkenny RVL with a history of bloat; in young calves, this is frequently an abomasal bloat. Occasionally *Sarcina* spp. are seen on histopathology, however the advice above is consistent for all cases of abomasal bloat.

#### Parasitic gastroenteritis



**Figure 3: Oedema of the abomasal folds in a case of parasitic gastroenteritis. Photo: Aideen Kennedy.**

An 11-month-old weanling with severe diarrhoea was submitted to Kilkenny RVL. This was the fifth case from a group of 33. On necropsy, there was ascites, with approximately five litres of fluid in the peritoneal cavity. There was marked oedema in the mesentery and in the intestinal walls. There was also marked oedema in the abomasal folds. Multiple causes of hypoproteinaemia were investigated and while the McMaster's test egg counts were low, histopathology of the abomasum showed changes consistent with parasitism, including multiple cross sections of nematodes within the abomasal glands. Faecal egg counts from cohort animals indicated high strongyle burdens and a review of parasite control was recommended.



**Figure 4: A H&E stained cross section of abomasal wall from a case of parasitic gastroenteritis, with visible cross sections of nematodes (arrows). Photo: Aideen Kennedy.**

#### Bacteraemia

A number of calves have been submitted to Kilkenny RVL with a history of diarrhoea; frequently there is evidence of an associated bacteraemia/septicaemia. One calf with this history had a suspected hypopyon and was severely dehydrated. A compromised intestinal barrier may facilitate the entry of bacteria and the establishment of a bacteraemia, leading to lesions in other organs such as hypopyon (more commonly abscessation, septic arthritis).



**Figure 5: Hypopyon in a calf with bacteraemia/septicaemia. Photo: Maresa Sheehan.**

#### RESPIRATORY TRACT

##### Pneumonia

Limerick RVL examined a 10-week-old calf that had been bought-in to the herd at four weeks of age and did not respond to treatment for pneumonia with antibiotics. Upon necropsy of the lungs, discrete visible and palpable nodular lesions on the surface and in the parenchyma of the lungs were disclosed which are suggestive of *Mycoplasma bovis*. Polymerase chain reaction (PCR) testing returned a positive result for *Mycoplasma bovis* and bovine respiratory syncytial virus (BRSV).





**Figure 6: Pneumonia with palpable nodular lesions suggestive of *Mycoplasma bovis*. Photo: Brian Toland.**

A three-month-old weanling with clinical signs of pneumonia was submitted to Kilkenny RVL. On necropsy, there was a fibrinous pleuritis and cranioventrally distributed consolidation affecting approximately 30 to 40 per cent of the lungs. In addition, there was a large abscess in the liver, likely originating from a previous umbilical infection. *Trueperella pyogenes* was cultured from the liver, and *Mannheimia haemolytica* and *Pasteurella multocida* were identified in the lungs. A review of respiratory disease control, and umbilical hygiene at calving was recommended.

Limerick RVL carried out a necropsy on a six-month-old Friesian heifer, which did not respond to treatment, pined away and died; there were a number of other casualties among cohorts. Examination of the lungs disclosed consolidation of 15 to 20 percent of lung volume with a cranioventral distribution and multifocal areas of 'ground glass' emphysema suggestive of viral or parasitic involvement (no lungworm were seen). PCR testing was positive for *Mycoplasma bovis*, *Haemophilus somni* and BRSV.

**Pneumonia and parasitic gastroenteritis**

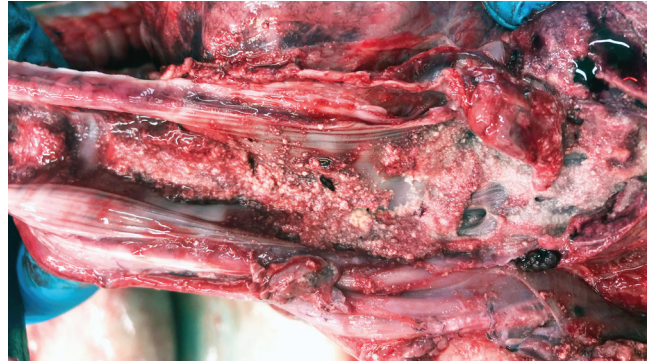
A 13-month-old bullock was presented to Kilkenny RVL with a history of pneumonia and diarrhoea. On gross post-mortem examination, there was a severe, sub-acute, fibrinous pleuropneumonia affecting approximately 50 per cent of the volume of both lungs; copious straw-coloured fluid and fibrin were present in the pleural cavity. There was suspected hyperplasia of the abomasal glands and fluid contents in the small and large intestines. *M. haemolytica* was isolated and 400 strongyle eggs per gram (EPG) were seen in faecal samples. *M. haemolytica* is a primary pathogen capable of causing severe acute pneumonia in all aged animals. The presence of this number of strongyle eggs suggests a moderate infection and that parasitic gastroenteritis may also be playing a role.



**Figure 7: Fibrinous pleuropneumonia from which *Mannheimia haemolytica* was cultured. Photo: Maresa Sheehan.**

**Aspiration**

Limerick RVL carried out a necropsy on a one-week-old Friesian bull calf with diarrhoea, the animal was anorexic and had been tube-fed with milk or milk replacer. Examination of the lungs disclosed milk (or milk replacer) in the airways, and the quantity present was significant enough to seriously compromise breathing and ultimately led to pneumonia and death.

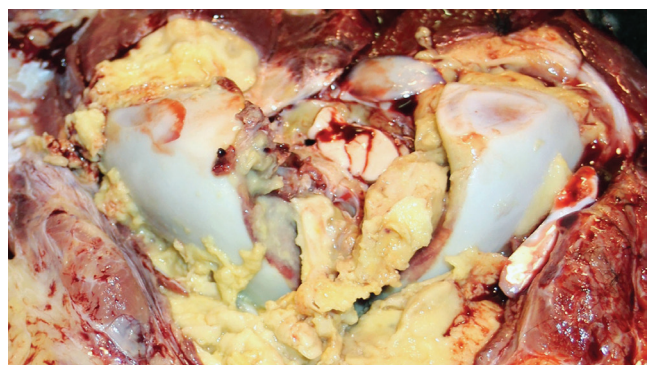


**Figure 8: Aspirated milk, or milk replacer, in the trachea of a week-old calf. Photo: Brian Toland.**

**NERVOUS SYSTEM**

**Necrotising osteomyelitis**

Athlone RVL examined a 10-month-old Friesian weanling with a history of having been sick for over a week; the reported signs included pyrexia and opisthotonos. The animal was treated with vitamin B1, corticosteroids and oxytetracycline, it initially improved, but relapsed after treatment stopped, and died. There was foul-smelling fibrinopurulent material surrounding the atlanto-occipital joint and extending along the spinal cord and caudal brainstem. There was a lytic lesion containing foul purulent fluid on cross section of the left occipital bone. Other organs were unremarkable. *Bacillus licheniformis* was isolated from a sample of the bone lesion. A diagnosis of necrotising osteomyelitis and myelitis was made.



**Figure 9: Fibrinopurulent material surrounding the atlantooccipital joint of a weanling with necrotising osteomyelitis. Photo: Denise Murphy.**

**MUSCULOSKELETAL**

**Traumatic pharyngeal injury**

A two-day-old calf was submitted to Kilkenny RVL. The calf had not responded to treatment for a swollen neck. On necropsy, the oesophagus was perforated, and there was a large volume of fibrin in the thoracic cavity. There was



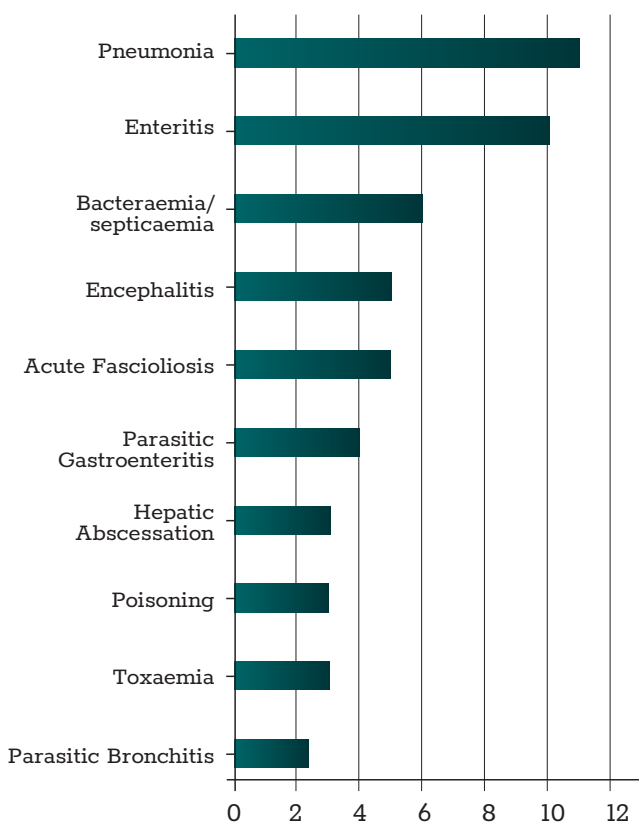
inflammation and oedema of the neck musculature adjacent to the perforated oesophagus. A review of feed-tubing technique, including lubrication in dehydrated subjects, and examination of the tubing equipment for sharp edges was recommended.



**Figure 10: Fibrin at the site of an oesophageal perforation (arrow) and in the thoracic cavity (left). Photo: Aideen Kennedy.**

**SHEEP**

Pneumonia and enteritis were the most common diagnoses at necropsy in sheep in the RVLs during February 2023.



**Table 2: The most common diagnoses in sheep submitted for necropsy in February 2023.**

**GASTROINTESTINAL TRACT**

**Ruminal acidosis**

A nine-month-old lamb was found dead and submitted to Kilkenny RVL. It had been fed on grass, rape and grain. On examination, the lamb was severely dehydrated. There was a large amount of undigested grain in the rumen and reticulum.

The rumen papillae remained adherent (a common post-mortem finding in ruminal acidosis). The small intestinal contents were bloody. A ruminal pH of 4.2 was recorded (normal ruminal pH is 5.5-7.0). Testing of samples for *C. perfringens* toxins was negative. A diagnosis of acidosis due to grain overload was made. Ruminal acidosis develops in ruminants that have ingested large amounts of feed rich in highly fermentable carbohydrates. Large quantities of volatile fatty acids and lactic acid are produced which reduce the ruminal pH. Once the ruminal pH falls below a certain value, there is death of normal flora and damage to rumen epithelium. The osmotic pressure increases within the rumen, pulling fluid into the rumen, eventually leading to acute dehydration, disturbance of blood acid-base balance and circulatory collapse.



**Figure 11: Significant quantities of undigested grain in the ruminal contents of a lamb with rumen acidosis. Photo: Aideen Kennedy.**

**Johne's disease**

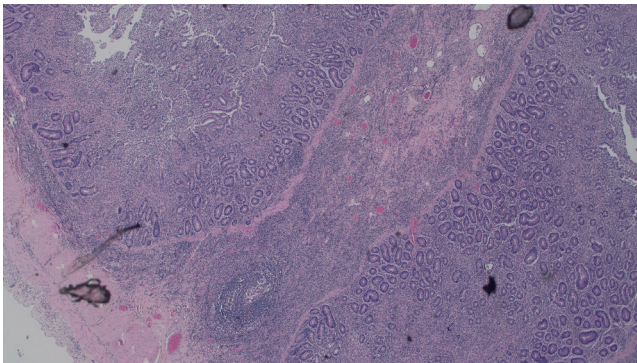
A three-year-old ewe was submitted to Kilkenny RVL as part of the Thin Ewe Study. On examination, there was very fluid intestinal content and mild oedema in the small intestine walls. On histopathology, there was a chronic granulomatous enteritis with occasional giant cells, and marked infiltration of cells into the submucosa, intercellular aggregations of mycobacteria were detected by Ziehl-Neelsen (ZN) staining. Faecal samples were positive for *Mycobacterium avium* subsp. *paratuberculosis* on PCR and serum samples also tested positive. In sheep, Johne's disease presents as chronic weight loss or a low body condition score and poor fleece in individual sheep (typically 3 to 4 years-old). Chronic diarrhoea, unlike cattle, is not the main feature in many affected sheep.

**Thin Ewe Study**

The Thin Ewe Study continues, and is open to the submission of three culled ewes from flocks willing to euthanise and submit them for examination and testing for a range of causes of ill-thrift/weight loss in sheep (including the so-called iceberg diseases, which are maedi-visna, ovine pulmonary adenocarcinoma (OPA)



Johne's disease and caseous lymphadenitis). The post-mortem and all tests are conducted free of charge, and are of particular interest to flocks with a recurring issue with thin ewes. Please contact your local RVL If you have a flock that might be willing to participate.

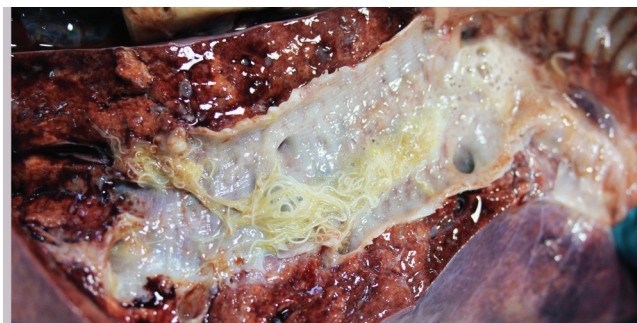


**Figure 12: Granulomatous enteritis consistent with Johne's disease in sheep. Photo: Aideen Kennedy.**

**RESPIRATORY TRACT**

**Parasitic bronchitis and pneumonia**

Athlone RVL examined a four-year-old ewe whose owner thought was losing weight for about 10 days, but no other specific signs were noted. She was treated for pregnancy toxæmia and given minerals and fed hay and meal. Her body condition was poor with a body weight of 51.5kg. There was an absence of fat around the kidneys and serous atrophy of cardiac fat. There were twin fresh foetuses of about four months gestation in the uterus. Calcium, magnesium and Beta-hydroxy butyrate (BHB) concentration in vitreous humour were within normal parameters. Multifocally throughout the lungs, there were firm 1-2cm lesions. Copious numbers of lungworms (*Dictyocaulus filaria*) were seen in the trachea and bronchial tree. Intestinal contents and faeces were loose, and the abomasal mucosa was grey and thickened. Lungworm larvae were detected in the faeces and there was a strongyle egg count of 4,000 EPG. PCR testing of the lung for ovine pulmonary adenocarcinoma (OPA/Jaagsiekte) and maedi-visna viruses were negative. Histopathology of lung sections showed a multifocal suppurative broncho-interstitial pneumonia with copious cross sections of lungworm seen. A conclusion of parasitic bronchitis and pneumonia was reached.

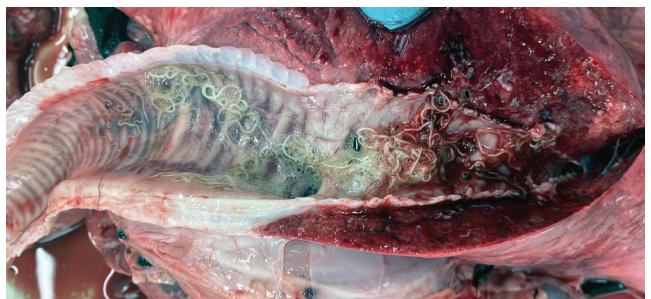


**Figure 13: Lungworms in the bronchi of an adult ewe. Photo: Denise Murphy.**



**Figure 14: Fibrinous pleuritis, pericarditis and pneumonia involving the cranial lung lobes. Photo: Alan Johnson.**

Limerick RVL examined a one-year-old Mule sheep with a history of poor thrive at grass. It was small in stature and was in poor body condition, with heavy faecal soiling of the perineal area. On gross post-mortem examination, there were lesions of fibrinous pleuritis, pericarditis and pneumonia involving the cranial lung lobes. *T. pyogenes* was isolated on culture and *M. haemolytica* was detected by PCR. A large number of lungworm larvae were visible in the airways. There was a faecal egg count of >10,000 strongyle eggs per gram, and coccidial oocysts and lungworm larvae were also detected in the sample tested. The hepatic cobalt concentration was low. A review of the parasite control programme in place on the farm was recommended.



**Figure 15: A large number of lungworms (Dictyocaulus filaria) in the trachea of a sheep. Photo: Alan Johnson.**

**POISONINGS**

Two ewes were presented to Kilkenny RVL that had "pined away" shortly after lambing. On gross post-mortem examination, the mucous membranes were icteric, their livers were pale, and the kidneys were dark in colour. The hepatic and renal copper concentrations were above the reference range, confirming copper toxicosis. On histopathology, there was a multifocal necrotising hepatopathy. Accumulations of copper pigment were identified in hepatocytes and phagocytic cells by Rubeanic's stain (showing as green-black granules), with associated hepatocyte degeneration. Sheep are particularly susceptible to copper toxicity which can occur acutely or over a period of time due to dietary excess of copper or low intakes of molybdenum, sulphur, zinc, or calcium. Stresses, such as inclement weather, environment,



poor nutrition, transportation, and handling can also cause the liver cells to die and release the stored copper into the bloodstream causing intravascular haemolysis.

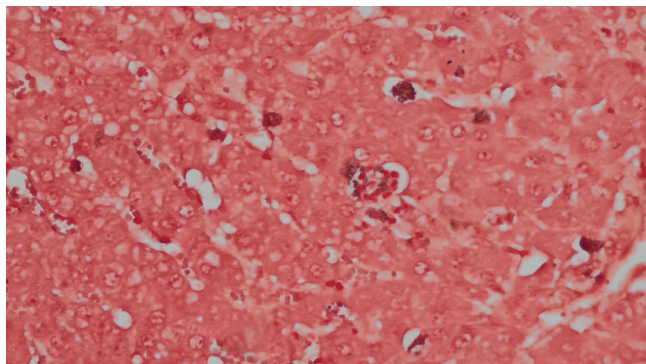


Figure 16: Granules of copper in the liver of a ewe identified by Rubeanic's stain. Photo: Lisa Buckley.

half and two-thirds of infected animals had no visible lesions (NVL).

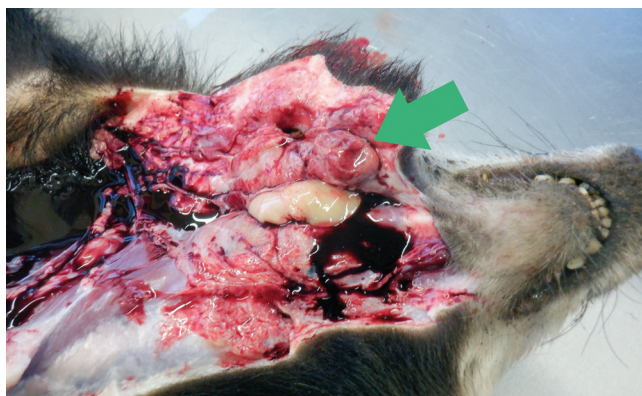


Figure 17: Purulent material escaping from a tubercular abscess in the submandibular lymph node (arrow) of a badger. Photo: Aideen Kennedy.

**BADGER**

**Tuberculosis**

A 9.8kg male badger was submitted to Kilkenny RVL with a discharging abscess in the right submandibular lymph node. *Mycobacterium bovis*, the causative organism of tuberculosis was detected on culture. The lesion had not become calcified, as is common in TB granulomas in cattle. Mineralisation is a less common feature of TB lesions in badgers than in cattle; studies of cull badgers in Ireland have shown that between a



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