BOVINE
A total of 132 bovine carcases and 490 bovine foetuses were examined in the RVLs during January. The number of foetuses is a sharp increase on December and heralds the beginning of the peak calving period. *Trueperella pyogenes* was the most frequently isolated bacterial pathogen (40 cases) followed by *Listeria monocytogenes* (22 cases) and *Salmonella* Dublin (16 cases). *Neospora caninum* also featured prominently accounting for 17 cases of abortion. There were two diagnoses of Schmallenberg virus based on gross findings at post mortem examination. Other notable findings among bovine foetuses examined were dystocia/hypoxia as a cause of death in five calves and developmental abnormalities or dwarfism in four calves. Among bovine carcases, pneumonia (26 cases) and enteritis (19 cases) were the most common diagnoses recorded. *Mycoplasma bovis* was diagnosed in four animals (two calves, a bull and a 22-month-old heifer). *Mannheimia haemolytica* (all less than one-month-of-age) and *Pasteurella multocida* were isolated from three cases each. Clostridial diseases were diagnosed relatively infrequently during January with one case of blackleg diagnosed by Kilkenny in a yearling and two cases of clostridial enterotoxaemia were diagnosed in yearlings by Sligo. Four cases of bovine neonatal pancytopenia (BNP) were recorded by Kilkenny on three different farms while three cases of abomasal ulceration and peritonitis were also recorded – two in six-week-old calves (one in Dublin and one in Limerick) and one case in a six-year-old cow (Limerick).

OVINE
There were 75 cases of abortion examined in the RVLs during January. A breakdown of the agents identified is outlined in Table 1.

<table>
<thead>
<tr>
<th>Agent</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Toxoplasma gondii</em></td>
<td>16</td>
<td>21.3%</td>
</tr>
<tr>
<td><em>Campylobacter</em> spp.</td>
<td>8</td>
<td>10.7%</td>
</tr>
<tr>
<td><em>Streptococcus</em> spp.</td>
<td>6</td>
<td>8.0%</td>
</tr>
<tr>
<td><em>Chlamydia</em> spp.</td>
<td>3</td>
<td>4.0%</td>
</tr>
<tr>
<td><em>Listeria monocytogenes</em></td>
<td>2</td>
<td>2.7%</td>
</tr>
<tr>
<td><em>Salmonella</em> Dublin</td>
<td>1</td>
<td>1.3%</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>4.0%</td>
</tr>
<tr>
<td>No agent identified</td>
<td>36</td>
<td>48.0%</td>
</tr>
</tbody>
</table>

There were four cases of listeriosis recorded in January, two in Sligo and one in Athlone in adults, and one in Kilkenny in a 7-month-old lamb. There were eight cases of ruminal acidosis – five in Sligo, two in Kilkenny and one in Athlone. The Sligo cases were in lambs from two farms and a ewe from a third. There were just two cases of chronic fasciolosis in January, recorded by Sligo in adult ewes. There were two cases of jaagsiekte recorded – one in Sligo and one in Athlone. Both ewes were over three years-of-age. Peripartum conditions such as pregnancy toxaemia and uterine prolapse were recorded in one animal each during January. Uterine prolapse tends to be recorded infrequently by the laboratories as this is normally a clinical rather than a laboratory diagnosis. There was a single case of poisoning recorded in sheep in January – copper poisoning in a ewe recorded by Athlone. *Mannheimia haemolytica* was isolated from the lungs of two ewes in which pneumonia was diagnosed – one in Sligo and one in Athlone.
NORTHWEST REGION

BOVINE

Weanlings
Urolithiasis
Sligo RVL diagnosed urolithiasis in a nine-month-old weaning that was uraemic and severely dehydrated. There was a chemical peritonitis associated with a hugely enlarged and leaking bladder. The obstruction was at the level of the sigmoid flexure and consisted of a soft crystalline plug in a heavily inflamed urethra.

OVINE

Adults
Caseous Lymphadenitis
Sligo RVL diagnosed Caseous Lymphadenitis (CLA) (Figure 1) in a ewe which had died following massive haemorrhage into the thorax. The prescapular lymph node presented with characteristic green pus. This animal had been recently purchased by a pedigree flock. The CLA was not considered significant in the death of this animal but this case highlights the dangers of purchasing sheep from flocks of unknown CLA infection status.

Listerial meningoencephalitis
Sligo RVL had four cases of listerial meningoencephalitis in sheep in January from three separate flocks. In two of the flocks comrade sheep had died after presenting with similar clinical signs. These were described as staggering, circling, head tilt, unilateral drooling and ataxia. All of the sheep were housed and had been fed silage. One ewe was 5-years-old, but the other three cases were in yearlings. The adult ewe had a periapical molar abscess in the maxilla. Encephalitis caused by Listeria monocytogenes is most common in housed sheep in late winter and early spring when they are losing and erupting teeth. Histopathological findings revealed a moderate thickening of the meninges with evidence of heavy leucocytic infiltration. There were very thick perivascular cuffs present, consisting of predominantly neutrophils and occasional lymphocytes.

Ruminal acidosis
Sligo RVL had 5 sheep presented from three holdings with acute ruminal acidosis in January. All cases involved accidental access to large quantities of grain. Post mortem findings revealed that the rumens were expanded by sloppy, sour-smelling yellow contents saturated with maize kernels or oats. The pH range was from 4.2 – 4.7. Severe acidaemia and metabolic acidosis follow when the ruminal pH drops to less than 5.0.

Ovine Pulmonary Adenomatosis
Sligo RVL diagnosed jaagsiekte (ovine pulmonary adenomatosis) in a four-year-old ewe that had shown poor appetite and depression for a few days before death. There was extensive consolidation of the dorsal lung lobes and the airways were filled with fluid. Diagnosis was made on histopathology (Figure 2). The condition is infectious and the virus is found in the airway secretions issuing from the tumours.

FURTHER OBSERVATIONS

Sligo RVL diagnosed two cases of clostridial enterotoxaemia in sudden death weanlings in January.

Sligo RVL identified two congenital conditions in newborn calves in January. One calf had a ventricular septal cardiac defect and the other had atresia coli. Both cases had survived for a few days after birth.

MIDWEST REGION

BOVINE

Calves
Mannheimiosis
Three calves submitted from a herd where the mortality rate was high were all found by Limerick RVL to have lesions of pneumonia. Pasteurella multocida and Mannheimia haemolytica were isolated. Respiratory virus PCR was unrewarding.

Mycoplasma bovis
A three-month-old Friesian bull calf was submitted to Limerick RVL for post mortem examination. The animal was housed with a group that had been showing some signs of pneumonia and this animal had been treated two weeks prior to death, and had apparently fully recovered. However, on examination the animal had extensive lesions of fibrous pleuropneumonia and pulmonary abscessation. A PCR test for Mycoplasma bovis was positive.
An outbreak of mastitis in dry and calved cows from a large dairy herd was found to be associated with *Mycoplasma bovis* infection. One infected cow developed signs of pneumonia and died. Some of the cows were concurrently infected with *Trueperella pyogenes*.

**OLDER BOVINES**

**Peritonitis**

A six-year-old dry Friesian cow submitted to Limerick RVL with a history of abdominal pain and depression was found to have acute peritonitis following the rupture of an abomasal ulcer. The cow was housed and on a diet of silage and sugar beet.

**FURTHER OBSERVATIONS**

There were 95 bovine foetuses submitted to Limerick RVL during the month, from which bacterial culture yielded *Trueperella pyogenes* from eight, *Listeria monocytogenes* from four, *Salmonella Dublin* from two, *Bacillus licheniformis* from two and *Mannheimia haemolytica* from one.

**SOUTH WEST REGION**

**OVINE**

Older sheep

A three-year-old sheep in poor body condition, which had died after gradually losing condition, was presented to Cork RVL. Post mortem examination revealed emaciation, clear pericardial effusion, prominent lymphatic vessels in some section of the mesentery, and six *Cysticercus tenicollis* larvae (cysts) in the mesentery and pleura. Microscopic examination confirmed *Johne’s disease*, and the mucosa and submucosa of the small intestine showed dense sheets of large macrophages, lymphocytes and numerous Langhan’s multinucleated giant cells (lepromatous granulomatous inflammation). Ziehl-Neelsen (Z-N) stained slides demonstrated large numbers of acid-alcohol-fast bacilli in the macrophages. Incidentally, large numbers of sarcocysts in the myocardium and *Cysticercus tenicollis* larvae in the peritoneum and pleura were also noted.

**OTHER SPECIES**

Ethylene Glycol toxicity

Organs from group of pigs with renal disease were submitted to Cork RVL for histological examination. Porcine dermatitis and nephropathy syndrome was suspected by the practitioner. No evidence of PDNS was observed in the kidneys. However, along with diffuse interstitial fibrosis, acquired tubular cysts and sclerotic glomeruli, scattered birefringent round to pyramidal crystals arranged in rosettes were observed in the tubular lumen (Figure 3). These crystals (calcium oxalate) are consistent with ethylene glycol toxicity and further retrospective investigation revealed accidental access to antifreeze solution in the group of pigs affected.

**SOUTH EAST REGION**

**BOVINE**

Abortion

*Salmonella Dublin*

A six-month gestation foetus was submitted to Kilkenny RVL. Placental tissue was submitted with the foetus and there was evidence of inter-cotyledonary placentitis (Figure 5). *Salmonella Dublin* was isolated from the placenta but...
not from the abomasum, emphasising the importance of submitting placenta for examination as well as the foetus. *Salmonella* Dublin can cause abortion by infecting the placenta where it causes atrophy of placental villi but without infecting the foetus.

Figure 5: Photograph depicting placentitis seen in a case of *Salmonella* Dublin abortion. Note the erythematous opaque intercotyledary tissue (black arrows). Photo: Dónal Toolan.

**OLDER BOVINES**

**Myocardial abscessation**

The carcass of a 30-month-old heifer with a history of having been sick and off form for the previous few days was presented to Kilkenny RVL. The post mortem examination revealed some evidence of brisket oedema. There were petechial haemorrhages visible on the mucosal surface of the trachea. There were two abscesses in the myocardium of the left ventricular wall (Figure 6). There was an additional abscess in the cardiac intra-ventricular septum. There was an abscess in the lungs adjacent but not connecting to the pulmonary artery. There was free fluid in the peritoneal cavity. *Truperella pyogenes* was isolated from the abscess in the heart. A diagnosis of myocardial abscessation with secondary heart failure and septicaemia was reached. The portal of entry of the infection that gave rise to the heart abscesses was not ascertained.

Figure 6. Photograph depicting myocardial abscessation (black arrows) associated with cardiac failure in a 2.5-year-old cow (Photo Maresa Sheehan).

**FURTHER OBSERVATIONS**

A number of full-term stillborn calves submitted to Kilkenny RVL in January 2014 presented with varying volumes of amniotic fluid within the trachea and heavy meconium staining. Whilst these findings are largely non-specific, they are very indicative of *pen-partum* foetal distress which may result from a delayed parturition. The causes for delayed parturition are many and require further investigation. An ovine foetus submitted to Kilkenny RVL yielded *Campylobacter* from the stomach contents of the lamb. *Campylobacter* abortion (vibriosis) in sheep is caused by *Campylobacter fetus fetus* or *Campylobacter jejuni*.

**NORTH EAST REGION**

**BOVINE**

**Abortion**

*Truperella pyogenes* was isolated from the liver and stomach contents of a number of bovine foetuses from individual herds in Dublin RVL. Histopathological findings included suppurative bronchopneumonia and multifocal random necrotising hepatitis. *Truperella pyogenes* is a recognised sporadic cause of bovine abortion. Bronchopneumonia in a foetus is a non-specific finding but indicative of an infectious aetiology and may reflect a primary inflammatory lesion in the placenta.

**OLDER BOVINES**

**Infectious Bovine Rhinotracheitis (IBR)**

A heifer, two-and-a-half years old, was submitted to Dublin with a history of pneumonia for two days ante mortem. Post mortem examination revealed a necrotising tracheitis with fibrinosuppurative pleuropneumonia. The change encountered was consistent with infectious bovine rhinotracheitis (IBR) infection with secondary bacterial pneumonia. PCR testing of tracheal mucosa confirmed IBR infection.

**Reticuloperitonitis**

An eight-year-old cow which was eight months pregnant was submitted to Dublin RVL with a history of chronic depression, animal became recumbent ante mortem. Post mortem examination revealed a greatly distended rumen which contained copious quantities of fluid and fragments of forage. Dense adhesions containing abscesses were evident between the reticular wall and the liver, and hepatic abscessation was evident. Chronic reticuloperitonitis was diagnosed. This is caused by perforation of the rumino-reticular wall by sharp object such as nail or wire. No foreign body was found in this case, and the literature reports this to be a common occurrence and may be due to disintegration of the foreign body. The literature also suggests that traumatic reticuloperitonitis may be predisposed to by increased intra-abdominal pressure of late pregnancy.

**OTHER SPECIES**

**Pigs**

*Actinobacillus pleuropneumoniae* (APP)

The carcass of a 120-day-old gilt from a group of 300 pigs was presented to Dublin RVL. All had been inappetant the
previous day and one pig was dead in the morning. At Post mortem examination there was an acute diffuse, fibrinous pleurisy and fibrino-necrotising pneumonia affecting up to 75% of lung volume in a predominantly anteroventral pattern. On histopathology there was an acute, severe fibrinonecrotising bronchopneumonia and pleurisy (Figure 7) with intralobular bacterial colonies and some degenerate inflammatory cells with oat cell morphology. *Actinobacillus pleuropneumoniae* (APP) was isolated. APP is one of the most important bacterial pathogens of pigs and is found worldwide. Virulence varies among strains. Its economic importance is mainly due to mortality, production losses and medical costs. Outbreaks can be due to the presence of concomitant diseases, changes in management or from other stressors.

![Figure 7: Photograph depicting fibrinous pleural adhesions seen with *Actinobacillus pleuropneumoniae* infection in a pig. Photo: Maire McElroy.](Image)

**MIDLANDS REGION**

**BOVINE**

Calves

*Salmonella* septicaemia

*Salmonella* septicaemia caused by *Salmonella* Dublin was diagnosed in a 2-day-old calf. Gross post-mortem examination showed a fibrinous peritonitis, jaundiced carcase and enteritis. *Salmonella* Dublin was isolated from multiple sites.

**WEANLINGS**

Endocarditis

A 10-month-old weanling with a history of pining showed evidence of endocarditis at Post mortem examination. There was a large cauliflower lesion on the tricuspid valve, an enlarged passively congested (nutmeg) liver and multiple small abscesses in the lungs. *Trueperella pyogenes* was isolated from the heart and lung.

**OLDER BOVINES**

Haemorrhagic bowel syndrome

*Post mortem* examination of a 3-year-old cow found displaced intestines, no torsion, with the jejunum full of blood clots, ruptured and necrotic. The ileum, caecum and large intestine had bloody contents. There was a hydropericardium, with approximately 600ml watery red-tinged fluid in the pericardial sac. *Clostridium* sp was isolated from the liver but FATs were negative. A diagnosis
of haemorrhagic bowel syndrome (HBS) was made. Cattle affected with HBS usually die within 12 to 36 hours after the onset of clinical disease. Cattle present with acute enteritis and concurrent dehydration and shock, with or without signs of abdominal pain and it has a case fatality rate of 85 to 100%. Pathologic examination of affected animals reveals severe hemorrhagic enteritis with intraluminal hemorrhage or blood clots. Hydropericardium is also a feature of this condition. Both Clostridium perfringens and Aspergillus fumigatus have been implicated in the development of HBS, though neither has been conclusively demonstrated to be the cause. Suggested risk factors for HBS include a high amount of fermentable carbohydrate in the diet, the level of dry matter (DM) intake, the level of milk production, feeding a total mixed ration, lactation number, herd size, season, and the presence of the causative organism in the feedstuff.

OVINE
Abortion
Campylobacter sp was identified as a cause of abortion in a flock with abortions at 3-4 month stage of gestation. Histology of the placenta showed a suppurative bacterial placentitis. Campylobacter abortion (vibriosis) in sheep is caused by Campylobacter fetus fetus or Campylobacter jejuni. The initial source of infection is faeces of domestic livestock (e.g. about 10% of cattle faeces are positive for Campylobacter), dogs and wildlife, including birds. Contamination of water supplies or feed troughs with faeces may pose a risk. Ingestion of food or water contaminated with the bacteria gives rise to a primary infection during pregnancy. Large numbers of organisms are present in the products of abortion (foetus, placenta, uterine fluids) and these are the main source of infection for susceptible ewes. Abortion usually occurs in the last third of pregnancy and large abortion storms may occur. The ewes do not become ill and do not abort from this cause in subsequent pregnancies. Campylobacter is a very important zoonotic hazard.

OLDER ANIMALS
Ruminal acidosis was diagnosed in a 9-month-old lamb with a history of sudden death, watery smelly scour. Gross post-mortem examination showed evidence of rumenal acidosis - a large amount of meal in the stomachs with a “porridgy” consistencey. The rumen pH was 4.9, confirming ruminal acidosis.

FURTHER OBSERVATIONS
There were 50 bovine foetuses examined during the month. Bacillus licheniformis, Trueperella pyogenes, Listeria monocytogenes and Neospora caninum were identified as abortive agents.
Suppurative bronchopneumonia caused by Pasteurella multocida was diagnosed in an 11-month-old weanling. There was severe anteroventral pulmonary consolidation at Post mortem examination. PCR for IBR was also positive. Gross post-mortem examination showed a hydrocephalus in a fullterm stillborn lamb with a swollen head. PCR was negative for Schmallenberg virus (SBV), but this does not rule out SBV as many cases of SBV foetopathy are PCR negative, due to the time lapse between infection and birth. Trueperella pyogenes was isolated from an umbilical abscess in a week-old lamb.