OVERVIEW

A total of 122 cattle and a further 348 bovine foetuses were examined in the RVLs during December. As expected at this time of the year, pneumonia was the predominant cause of mortality in those animals examined with a total of 34 cases recorded. RSV was the most commonly identified agent (six cases) with Pasteurella multocida (three cases), IBR (three cases), Mannheimia haemolytica (three cases) and Mycoplasma bovis (two cases) also recorded. The age profile of all pneumonia cases are shown in Figure 1.

Clostridial diseases were relatively infrequently diagnosed during December compared to other months with three cases of emphysematous abomasitis (Clostridium sordellii isolated from two), one case of black disease and one case of blackleg recorded. Hepatic abscessation was diagnosed in three adult animals. Trueperella pyogenes was isolated from one animal while Fusobacterium (Sphaerophorus) necrophorus was isolated from another.

There were five cases of peritonitis recorded. Two of these cases were in calves less than one month of age associated with navel infection while the remaining three cases were recorded in adult animals. Enteritis was diagnosed in 15 animals during December with hypogammaglobulinaemia recorded as a complicating factor in four calves. All fifteen animals were less than one month of age. Cryptosporidium was isolated with greatest frequency among these cases (four) with Salmonella Dublin, Giardia lamblia and Escherichia coli K99 accounting for one case each.

Some 91 faecal samples from neonatal animals were submitted in December. Of these, the most common pathogens detected were Cryptosporidium (31.9%) and rotavirus (13.9%). Forty five serum samples were analysed using the Zinc Sulphate turbidity (ZST) test in December. Of these, 58% returned results that reflected inadequate colostral transfer.

Table 1: Table illustrating the breakdown of pathogens detected from aborted bovine foetuses submitted to the laboratory service in December 2013.

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmonella Dublin</td>
<td>33</td>
<td>9.5%</td>
</tr>
<tr>
<td>Trueperella pyogenes</td>
<td>26</td>
<td>7.5%</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>18</td>
<td>5.2%</td>
</tr>
<tr>
<td>Bacillus licheniformis</td>
<td>12</td>
<td>3.4%</td>
</tr>
<tr>
<td>Listeria monocytogenes</td>
<td>9</td>
<td>2.6%</td>
</tr>
<tr>
<td>Neospora caninum</td>
<td>5</td>
<td>1.4%</td>
</tr>
<tr>
<td>Coliforms</td>
<td>4</td>
<td>1.1%</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>3</td>
<td>0.9%</td>
</tr>
<tr>
<td>BVD virus</td>
<td>2</td>
<td>0.6%</td>
</tr>
<tr>
<td>Streptococcus abeiris</td>
<td>2</td>
<td>0.6%</td>
</tr>
<tr>
<td>Listeria spp</td>
<td>2</td>
<td>0.6%</td>
</tr>
<tr>
<td>Aspergillus spp</td>
<td>1</td>
<td>0.3%</td>
</tr>
<tr>
<td>Schmallenberg virus</td>
<td>1</td>
<td>0.3%</td>
</tr>
<tr>
<td>Other diagnoses</td>
<td>8</td>
<td>2.3%</td>
</tr>
<tr>
<td>No agent identified</td>
<td>222</td>
<td>63.8%</td>
</tr>
</tbody>
</table>

Table 2: Table illustrating the breakdown of pathogens detected from ovine foeti submitted to the RVLs in December 2013.

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxoplasma gondii</td>
<td>6</td>
<td>24.0%</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>2</td>
<td>8.0%</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>2</td>
<td>8.0%</td>
</tr>
<tr>
<td>Listeria spp</td>
<td>1</td>
<td>4.0%</td>
</tr>
<tr>
<td>Campylobacter foetus</td>
<td>1</td>
<td>4.0%</td>
</tr>
<tr>
<td>Streptococcus abeiris</td>
<td>1</td>
<td>4.0%</td>
</tr>
<tr>
<td>Trueperella pyogenes</td>
<td>1</td>
<td>4.0%</td>
</tr>
<tr>
<td>No agent identified</td>
<td>11</td>
<td>44.0%</td>
</tr>
</tbody>
</table>
NORTHWEST REGION

BOVINE

Calves

Pleuropneumonia

Sligo RVL identified Bovine Respiratory Syncytial Virus (BRSV) and *Mannheimia haemolytica* in a two-week-old calf, with diffuse, bilateral pleuropneumonia. The calf was described as drowsy and had been failing for the previous week. The only treatment the calf had received was an oral vitamin and mineral supplement by the herdowner. There was no history of veterinary examination.

Peritonitis

Sligo RVL diagnosed diffuse chronic fibrinous peritonitis in a five-week-old calf, which had emanated from an omphalophlebitis. There was also pulmonary consolidation consistent with pneumonia. This calf had no history of illness, although the owner had noted several cohorts had bad coughs. This and the previous case indicate a need for emphasising the value of good stockmanship and early treatment of sick animals, although it is surprising the number of calves which appear at post mortem examination with evidence of peritonitis, which have had no previous history of illness.

Older bovines

Peritonitis

Peritonitis with a large inflammatory effusion into the peritoneal cavity was reported in a 1.5 year-old bull submitted to Sligo RVL. The rumen and omasum were impacted and there was an haemorrhagic enteritis. There was also pleuropneumonia. The bull had been found recumbent two days prior to submission in a slatted house, where the bull was housed with cows, which he had been serving as they came on heat. The bull had been purchased four to six weeks prior to death.

OVINE

Lambs

Black Disease

Infectious necrotic hepatitis (black disease) was diagnosed in an eight-month-old lamb submitted to Sligo RVL. Braxy had been suspected by the referring practitioner. The animal had been found dead, with no history of illness. Interestingly the animal had received a clostridal vaccination six weeks previously, but no booster, emphasising the importance of animals receiving the full course of clostridial vaccinations.

Older animals

Fasciolosis

Several cases of acute and chronic fasciolosis were diagnosed in Sligo RVL in December. Concurrent pneumonia was a feature of some of the cases. Seven sheep had died in one flock prior to the submission of a carcass for post mortem examination. The dosing regime in that flock was not considered adequate, as the sheep had been dosed three months previously with a product with efficacy against adult fluke only, and in another flock, no flukicide had been given since last year.

Peritonitis

Peracute peritonitis as a result of a ruptured uterus was diagnosed in a four-year-old ewe submitted to Sligo RVL. There was a large volume of uterine fluid found in the abdominal cavity. The rupture of the uterus had occurred as the ewe as expelling the foetus during abortion.

FURTHER OBSERVATIONS

- Sligo RVL found multifocal haemorrhaging abomasal ulcers in an anemic poorly fleshed autolysed pregnant yearling heifer. The animal had become recumbent on slats five days prior to death.
- Sligo RVL found a locally extensive, chronic, haemorrhaging pyloric ulcer in a six-week-old calf. The calf had been treated for a blood scour and had apparently recovered. Rotavirus and coronavirus were found on a home test kit for enteropathogens. However, these were not likely to be significant in an animal of this age.

SOUTH-EAST REGION

BOVINE

Calves

*Salmonella* septicaemia

The carcase of a two-week-old calf was presented with a history of possible meningitis to Kilkenny RVL. Grossly, the intestinal mucosa were very inflamed, erythematous and congested. There was little evidence of diarrhoea, however. The lungs were very congested and haemorrhagic. There was mottling throughout and blood oozed from the cut surfaces. *Salmonella* Dublin was isolated from intestinal contents and lung. Advice in relation to the zoonotic importance of this bacterium and its potential to cause bovine abortion was offered. Histopathology in the lung displayed an acute interstitial congestive pneumonia. Histopathological examination of the liver revealed numerous paratyphoid nodules (Fig 2) (areas of necrotic tissue with aggregates of neutrophils and other inflammatory cells within). These are commonly found in septicaemia cause by gram-negative bacteria including *Salmonella*.

Figure 2: A photomicrograph of a paratyphoid nodule in the liver of a two-week-old calf. (Photo: William FitzGerald).

Older bovines
Bleeding ulcer abomasal
An unusual presentation of a bleeding abomasal ulcer (Fig 3) was seen in a heifer aged 20 months. It had had no previous illness and was seen panting, and was pyrexic. The illness was acute (an hour or so). Post mortem showed pale mucosae, a non-perforating abomasal ulcer and multiple liver abscesses. It was concluded that the acute haemorrhagic anaemia, due to exsanguinations, caused the rapid breathing and the liver abscesses may have resulted in pyrexia.

![Image](image1.jpg)

**Fig 3: Haemorrhage from this non-perforated abomasal ulcer (white arrows) caused the death of a 20-month-old heifer. (Photo: Dónal Toolan)**

**OVINE**

**Lambs**

Salmonellosis
A 10-month-old sheep that had died suddenly without premonitory clinical signs was presented to Kilkenny RVL. Gross findings revealed that the superficial lymph nodes were enlarged. There was oedema in the pericardium and the lungs were oedematous and heavy. There were watery contents throughout the small and large intestines. There were multiple pale foci visible throughout the liver. *Salmonella* Dublin was isolated from the liver (Fig 4). A diagnosis of salmonellosis was reached. Advice in relation to the zoonotic importance of this finding and its potential consequences for the herdowner was highlighted.

![Image](image2.jpg)

**Fig 4. Photograph of multiple pale necrotic foci in the liver of lamb with salmonellosis. (Photo: Maresa Sheehan).**

**OTHER SPECIES**

**Avian**

The carcass of a six-month-old turkey which had been dull, sleepy, with yellow diarrhoea and not thriving for three weeks was submitted for post mortem examination. Fourteen out of 38 in the flock had died. It had been treated with antibiotics for five days. Marek’s disease was diagnosed following histopathological examination.

**EQUINE**

An equine foetus born to a mare recently imported from Italy was submitted for post mortem examination. Tissues from the foetus were positive for Equine Herpes Virus Type 1 and the dam’s blood had antibodies against EHV-1 and EHV-4.

**FURTHER OBSERVATIONS**

- *Aerococcus urinae* was isolated from the stomach

- Hypomagnesaemic tetany was diagnosed in an 11-year-old cow which had no specific gross post mortem examination changes. Eye fluid magnesium content was very low confirming the diagnosis.

- A three-year-old sheep, pining for three weeks, had pyelonephritis from which *Trueperella pyogenes* and *Staphylococcus aureus* were isolated.

- There were a number of diagnoses of parasitic gastro-enteritis in older lambs with high strongyle egg counts. In one case where there was evidence of parasitic gastro-enteritis, there was also pneumonia due to *Mannheimia haemolytica* and low tissue cobalt.

- BVD virus was detected in a 1.5 year-old heifer
in which there was a severe fibrino-suppurative bronchopneumonia from which *Mannheimia haemolytica* was isolated. There was also bridging fibrosis in the liver of this animal - the result of chronic fasciolosis and may also have been a predisposing factor to the respiratory disease.

**NORTH EAST REGION**

**BOVINE**

**Calves**

Salmonellosis

Dublin RVL saw a four-week-old calf, with a history of straying from other calves in the group, followed by depression and scour, recumbancy and death occurred within 24 hours of initial presenting clinical signs. *Post mortem* examination revealed a dehydrated carcass, while contents of colon were watery and contained fibrin. *Salmonella* Dublin was isolated from several organs and from faeces confirming a diagnosis of Salmonellosis.

**Cystitis**

Dublin RVL saw an adult sow with a history of depression and recumbancy for four days *ante mortem*. *Post mortem* examination revealed pus in the urinary bladder while bladder wall itself was very congested, pus was also evident in the ureters and renal pelvis. Histopathology revealed a severe suppurative cystitis and pyelonephritis. Bacterial pathogen was not isolated on culture, however the sow was undergoing antibiotic therapy which may have inhibited bacterial culture growth. Cystitis with pyelonephritis is a leading cause of mortality in sows, it is caused by an ascending infection from the vagina along the relatively short urethra to the urinary bladder, with subsequent spread of infection up the ureters towards the kidneys.

**SOUTH WEST REGION**

**BOVINE**

Congenital

Bicephalic calf

Two unusual congenital deformities were seen in Cork RVL, a bicephalic calf (two-headed calf) (Fig 5) which normally represent an incomplete set of twins that occasionally can lead to dystocia and, a calf with absence of a thoracic limb (*amelia*), apparently associated with chromosomal instability. Both calves produced negative results for Schmallenberg virus antigen and SBV antibodies and no bacterial growth was obtained in any of the foetal cultures from the abomasal contents.

**CALVES**

Navel ill

A few cases of peritonitis and joint-ill associated with navel-ill were diagnosed in Cork RVL. In a particular case, a five-day-old calf, along with polyserositis, exhibited endophthalmitis. A pure growth of *Escherichia coli* was obtained in the liver, lung, joint fluid and brain samples taken from this animal. There had also been a complete failure of colostral transfer (ZST result of 1).

**Weanlings**

Infectious Bovine Rhinotracheitis

Two feedlot weanlings had displayed severe dyspnoea and had received antibiotic therapy before death. At *post mortem* examination in Cork, both animals showed pulmonary consolidation affecting 20% to 30% of the lungs, pulmonary emphysema in the caudal lobes, and severe fibro-necrotic tracheitis (Fig 6). No significant bacteria were isolated in routine and choco-agar media cultures. Histological examination revealed fibrinous bronchopneumonia characterised by heavy bronchiolar infiltration of lymphocytes, alveolar deposition of neutrophils and fibrin and multifocal areas of coagulative necrosis surrounded by an outer layer of inflammatory cells. These lesions were thought to have been caused by secondary bacterial invasion, possibly *Mannheimia haemolytica*. The fibro-necrotic tracheitis suggested BHV1 (IBR) which was confirmed by PCR assay in both animals. Additionally, *Mycoplasma bovis* was also detected in one of them by PCR assay.

**Figure 6. Photograph illustrating severe fibrino-necrotic tracheitis in a feedlot weanling calf with Infectious Bovine Rhinotracheitis. (Photo: Cosme Sánchez-Miguel).**
CURRENT FINDINGS

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OVINE
Lambs
Haemorrhagic enteritis
A one-day old lamb that had been born healthy died suddenly after a very short malaise. Post mortem examination revealed hemorrhagic enteritis (Figure 7) with intestinal loops filled with blood and fibrin. A presumptive diagnosis of clostridial lamb dysentery/haemorrhagic enteritis was made; however, laboratory confirmation of Clostridium perfringens toxins in the intestinal contents failed to demonstrate any of the four toxins, despite the samples being obtained from a fresh carcass. Also, the Escherichia coli K99 ELISA test in the intestinal contents gave a negative result. Anaerobic culture of samples taken from the intestine produced a profuse pure growth of Clostridium sordellii. This was considered an unusual presentation and lesion since Clostridium sordellii has been associated with acute abomasitis in young lambs rather than haemorrhagic enteritis.

FURTHER OBSERVATIONS
• Listeriosis monocytogenes was isolated with a septicamic distribution in a one-week old alpaca. The farmer primarily suspected mismothering, however some milk was found in the abomasum.

Figure 7. Photograph of dark blood filled loops (white arrows) in a lamb with hemorrhagic enteritis. (Photo: Cosme Sánchez-Miguel).

MIDWEST REGION

BOVINE
Calves
Salmonellosis
Two nine-week old bought-in calves with a history of coughing before death were submitted to Limerick RVL for examination. Both calves were in poor body condition. The first calf had lesions of enteritis and Salmonella Dublin was isolated from liver, spleen and lungs. The second calf had gross lesions of pneumonia, with consolidation and abscessation of the cranial lobes. Pasteurella multocida and Salmonella Dublin were isolated from this animal.

Older bovines
OVINE
Lambs
Parasitic gastroenteritis
An eight-month old lamb submitted to Limerick with a history of diarrhoea and poor-thrive for one week before death, was found to have lesions of parasitic gastroenteritis. Tapeworms were visible in the intestinal lumen and >10,000 strongyle eggs per gram were detected in a sample of faeces examined. Coccidial oocysts were also seen and Salmonella Dublin was isolated from the liver and lung. The owner had focused on mineral deficiencies within the flock and failed to implement an adequate parasite control programme.

Other Species
An adult peregrine falcon (Falco peregrinus) was submitted to Limerick RVL by the National Parks and Wildlife Service, having been found dead and in a decomposed state by a farmer. An x-ray (Fig 8) revealed two shot-gun pellets and a broken wing (radius and ulna). Toxicological analyses carried out by the State Laboratory in Backweston revealed positive levels of brodmadliolone and brodifacoum, both commonly used rodenticides.

Figure 8. Photograph of an x-ray of a Peregrine Falcon revealing two shot-gun pellets (yellow arrows) and a broken radius and ulna (Blue arrow). (Photo: courtesy J. Garrahy, PVP)

FURTHER OBSERVATIONS
• Pneumonia associated with respiratory syncytial virus (RSV) was diagnosed by Limerick in a two-month old Charolais suckler calf with a history of respiratory distress over a 24-hour period.
• Colisepticaemia was suspected as the cause of death of two three-day old lambs submitted to Limerick RVL during the month. Both lambs had lesions of enteritis and Escherichia coli was isolated from all organs cultured.