SOUTH-EAST REGION

BOVINE ABORTION AND CONGENITAL DISEASE

Schmallenberg Virus
Kilkenny RVL suspected

Schmallenberg Virus as the cause of a bizarre deformity of the head of a full term bovine foetus. Both upper and lower jaws were short and upturned and there was a single central eye (Fig 1). There was also arthrogryposis and hydranencephaly. PCR was negative for Schmallenberg virus. However, gross lesions were quite suggestive of infection.

CALVES

Septicaemia
A two-day-old calf with a history of digestive tract problem presented at Kilkenny RVL. Gross findings at PM examination were that the perineal area was soiled, mucous membranes were hyperaemic, and there were petechial haemorrhages on the heart and spleen. There was fibrin present in the abdominal cavity and on the surface of the liver. Listeria monocytogenes was isolated from the lung, liver and spleen. Histopathological examination revealed a hepatitis with accumulations of mononuclear inflammatory cells and necrosis. A nephritis and enteritis were also present. A diagnosis of septicaemia was made. Listeria monocytogenes is an ubiquitous organism and a potential zoonosis.

Intussusception
A two-month-old calf was submitted to Kilkenny RVL with a history of tenesmus and severe depression. The animal was very dehydrated with the optic globe well retracted into the socket. Post mortem examination revealed an intestinal intussusception of approximately 30cm of intestine.

Schmallenberg
Submission of deformed calves on suspicion of Schmallenberg virus infection continued in February. Many cases were diagnosed based on gross findings where they were characteristic of disease.

NEONATAL ENTERITIS

There were increasing numbers of neonatal calves submitted to the RVL service. The most common agents isolated from faecal samples were rotavirus, Cryptosporidium and Salmonella, in decreasing order. Hypogammaglobulinaemia, likely as a result of failure of passive transfer was also regularly encountered.

ABORTION

In February 2013, approximately 330 bovine foetuses were submitted to the Regional Veterinary Laboratory service. The most commonly isolated abortifacients were Bacillus licheniformis, Trueperella pyogenes, Listeria monocytogenes and Salmonella Dublin. In many cases, no diagnosis was achieved. This is consistent with international experience where diagnosis is achieved in 35-40% of cases. In abortion outbreaks, multiple submissions may be required in order to achieve a diagnosis.

There were 180 submissions of ovine foetuses to the RVL service. Of these, 29 were diagnosed with Toxoplasma gondii, 28 were diagnosed with Chlamydia abortus (Table 1)

<table>
<thead>
<tr>
<th>Agent</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>No agent identified</td>
<td>96</td>
</tr>
<tr>
<td>Salmonella dublin</td>
<td>6</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>1</td>
</tr>
<tr>
<td>Bacillus licheniformis</td>
<td>4</td>
</tr>
<tr>
<td>Listeria monocytogenes</td>
<td>2</td>
</tr>
<tr>
<td>Listeria spp</td>
<td>2</td>
</tr>
<tr>
<td>Aspergillus spp</td>
<td>1</td>
</tr>
<tr>
<td>Campylobacter spp</td>
<td>5</td>
</tr>
<tr>
<td>Toxoplasma gondii</td>
<td>29</td>
</tr>
<tr>
<td>Salmonella</td>
<td>1</td>
</tr>
<tr>
<td>Schmallenberg virus</td>
<td>2</td>
</tr>
<tr>
<td>Chlamydia abortus</td>
<td>28</td>
</tr>
<tr>
<td>Trueperella pyogenes</td>
<td>3</td>
</tr>
<tr>
<td>Grand Total</td>
<td>180</td>
</tr>
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</table>

Abomasal Bloat
A one-month-old calf carcass was presented to Kilkenny with a history of pining and developing a pot belly. Gross post mortem revealed a distended abomasum and hyperaemic intestine with haemorrhagic contents. Laboratory findings revealed no significant findings. A tentative diagnosis of an abomasal emptying defect was made. Abomasal bloat and abomasitis in calves is a sporadic disorder. This disease is characterised by a fairly rapid onset of abdominal distension, depressed attitude, and occasional signs of colic. Affected animals may be seen to grind their teeth and salivate. Diarrhoea may or may not accompany these signs. Once abdominal distension is severe, if the
flank of the calf is shaken by hand, tinking and splashing may be heard. The cause(s) of abomasal bloat and abomasitis are not fully understood, and there are quite a few factors that have been proposed to be involved. Bacterial infection of the abomasal wall, compromised immunity from inadequate colostrum, ingestion of foreign bodies such as hair and coarse plants, and vitamin/mineral deficiencies have been proposed as factors involved in the development of this disease. Specifically, vitamin E, selenium, and copper deficiencies have been implicated as causative factors. Clostridium perfringens type A has been shown to experimentally cause the disease in calves. A common thread in cases of abomasal bloat seems to be ingestion of a larger-than-ideal milk meal. This may result in a slowing of stomach emptying, which may then enable the bacteria to ferment the milk and create gas. Given the multitude of contributory factors proposed to date, it is possible that this disease occurs when multiple factors occur together. A 10-week-old calf carcass was presented to Kilkenny with a history of respiratory problems. Gross examination chronic intrahepatic cholangitis (chronic fasciolosis) and numerous rumen fluke larvae attached to the ruminal mucosa. The mucosa of the small intestine was congested and the mesenteric nodes slightly enlarged. No other specific gross lesions were observed, but microscopic examination of the small intestine revealed intestinal submucosa expanded by abundant numbers of macrophages (granulomatous inflammation) and also the mesenteric lymph node showed a large number of foamy macrophages admixed with lymphocytes (granulomatous lymphadenitis). Large numbers of acid-fast organisms (Fig 5), consistent with Mycobacterium paratuberculosis infection (Johne’s disease) were seen associated with this granulomatous reaction.

**OLDER BOVINES**

Paratuberculosis

A two-year-old bullock with intermittent diarrhoea and in poor body condition (emaciated) presented on gross examination chronic intrahepatic cholangitis (chronic fasciolosis) and numerous rumen fluke larvae attached to the ruminal mucosa. The mucosa of the small intestine was congested and the mesenteric nodes slightly enlarged. No other specific gross lesions were observed, but microscopic examination of the small intestine revealed intestinal submucosa expanded by abundant numbers of macrophages (granulomatous inflammation) and also the mesenteric lymph node showed a large number of foamy macrophages admixed with lymphocytes (granulomatous lymphadenitis). Large numbers of acid-fast organisms (Fig 5), consistent with Mycobacterium paratuberculosis infection (Johne’s disease) were seen associated with this granulomatous reaction.

**SOUTH-WEST REGION**

**BOVINE ABORTION AND CONGENITAL DISEASE**

Schmallenberg virus abortion continued to be diagnosed in bovine abortion in the Cork RVL. There was a decrease in numbers of malformed foetuses but a number were presented displaying congenital deformities. Most cases were diagnosed by the detection of SBV antibodies in the precolostral foetus.

**WEANLINGS**

A significant parasitic burden was detected a 10-month-old weaning in poor body condition (ill-thrift). The animal showed clear pericardial effusion, chronic intrahepatic cholangitis (chronic fasciolosis), oedema of the mesentery and perirenal region and mild ascitis. The gall bladder and the mucosal reticulum wall were packed with large numbers of adult liver and rumen fluke larvae respectively (Fig 4).

**OTHER SPECIES**

A Corncrake (Crex crex) from a private collection that died suddenly, presented with multifocal small tubercle-like lesions throughout the liver and lungs. Yersinia pseudotuberculosis was isolated from...
the liver. Histological lesions consisted of suppurative multifocal hepatitis with clumps of bacteria surrounded by hepatocytic necrosis and granulocytic infiltration, however, no acid-fast bacilli were seen on a Ziehl-Nielsen stain.

**Fig 6. Photograph of a liver taken from a Corncrake displaying numerous white irregularly sized lesions. (Photo: Cosme Sanchez)**

### FURTHER OBSERVATIONS

Three cases of atresia coli and one of atresia jejunii were submitted to Cork RVL.

**Campylobacter foetus** was isolated in several lambs aborted from the same flock.

Liver fluke continued to be a contributing factor in a number of animal deaths in carcasses submitted to Cork RVL in February.

### NORTH-WEST REGION

#### CALVES

**Dystocia**

Several large full-term calves were submitted to Sligo with evidence of dehydration. Some had evidence of dystocia, such as fractured ribs, scleral haemorrhages and bruising particularly around the hind quarters.

**Peritonitis**

Sligo diagnosed two cases of peritonitis due to traumatic intestinal injuries in calves a few days old. Both calves had bigger than normal umbilical sacs and were being kept on slatted floors. The nature of the lesions combined with housing data suggested that cows may have stood on them. A three-week-old calf with a history of dullness and anorexia was submitted to Sligo RVL. On post mortem examination diffuse fibrinous peritonitis, as a result of a perforated abomasal ulcer, was diagnosed.

### OLDER CATTLE

**Peritonitis**

Diffuse fibrinous peritonitis as a result of perforation of the abomasum was diagnosed in a fattening bull submitted to Sligo RVL. The mucosa of the abomasum was quite haemorrhagic and there were a number of petechial haemorrhages. Rumen contents were very watery, reflecting a lack of dietary fibre and pH was 5.3, which is below the recommended 5.5 to 6.

In the previous six months, six bulls were submitted from the same herd and three of these had had a dietary related diagnosis. It emerged the bulls were being fed potato waste, which is a high starch feed. The longer it is stored, the more acidic it becomes. Both of these issues could accentuate the problem further. When such feed is incorporated into diets, adequate fibre and bicarbonate needs to be provided also.

**Mycoplasmosis**

Sligo RVL investigated an outbreak of mycoplasmosis in a large dairy herd. Cows presented with mastitis and arthritis, but tended to have one or the other presentation. Culling of mastitic cows, segregation of confirmed and suspect cases, as well as exemplary milking hygiene, seem to be containing the outbreak, but further work is ongoing.

#### SHEEP

**Ovine Abortion**

Toxoplasmosis was the most common diagnosis for abortions in sheep in February in Sligo. Chlamyphilia, Campylobacter, and streptococci were also detected in foetuses submitted for post mortem examination.

### LAMBS

A number of lambs were presented with histories of sudden death or dullness and inappetance prior to death. Intestinal volvulus and torsion was diagnosed in a number of these lambs submitted to Sligo RVL. In many cases, the diet contained a significant proportion of concentrates.

**OLDER SHEEP**

**Ringwomb**

Toxaemia, due to the retention of dead lambs in utero, was a daily diagnosis in Sligo RVL for the whole month of February. Wet tails and strings of placental membranes indicated failure of cervical dilation (ringwomb) was the most likely aetiology for the majority of these cases. However there were a handful of presentational and foetal oversise dystocias.

**Jaagsiekte**

Sligo diagnosed pulmonary adenocarcinoma (jaagsiekte) in an 11-month-old hogget with a history of respiratory distress. There was diffuse consolidation of the lungs and the lungs had a rubbery texture.

### FURTHER OBSERVATIONS

Sligo had a large increase in the number of dwarf, chondrodysplastic and deformed calves and lambs in February including a case of ectopia cordis in a calf in a lamb, this is a foetal malformation where the heart develops outside of the thorax.

Several calves presented to Sligo showed evidence of hypogammaglobulinaemia. Enteritis, omphalophlebitis and pneumonia were common findings in these calves. Low to marginal selenium levels were observed in several neonatal calves submitted to Sligo, which were diagnosed with weak calf syndrome. Clostridial entertotoxaemia was diagnosed in several lambs submitted to Sligo. In most cases, incomplete or partial vaccination histories for this disease were present.

Sligo RVL diagnosed several cases of chronic faciolosisfasciolosis cases in sheep during February. High strongyle burdens were seen in some of these cases as well. Nematodirus were also detected in a minority of cases.

### MID-WEST REGION

#### BOVINE

**Abortion**

Listeria monocytogenes was isolated from the stomach contents of two aborted bovine foetuses submitted to Limerick from different farms.

**Congenital**

A three-week-old calf that developed signs of respiratory distress before death was found by Limerick to have a ventricular septal defect. In a separate case, a one-day-old Charolais heifer calf, born weak and dead within an hour, was found to have an atrial septal defect.
**CURRENT FINDINGS**

**CALVES**

**Neonatal haemorrhage**

A one-day-old calf that had bled a little from the navel after birth but was otherwise normal and fed well, was found dead later and was submitted to Limerick for examination. Haemorrhage into the abdominal cavity from an umbilical vessel was diagnosed.

**Salmonellosis**

A 10-day-old bucket-fed Aberdeen Angus calf with a history of sudden death was examined by Limerick, where lesions of enteritis, hepatomegaly and splenomegaly were seen. *Salmonella* Dublin was isolated from all organs cultured and the zinc sulphate turbidity (ZST) test reading of eight units suggested poor absorption of colostral antibodies.

**Abomasitis**

A three-week-old suckler calf with a history of poor thrive and no appetite for 10 days before death was found by Limerick to have ulcers in the rumen and abomasal mucosa. On histopathology, lesions of fungal rumenitis and abomasitis were seen. A faecal sample was also positive for high numbers of *Cryptosporidium* oocysts.

**Mannheimiosis**

*Mannheimia haemolytica* was isolated from the lung and spleen of a six-week-old Limousin bull calf examined by Limerick (Fig 7). The calf had been intensively treated for pneumonia but had failed to respond. Lesions of diffuse fibrinous pleuritis, pericarditis and pneumonia were seen on post-mortem examination.

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**BOVINE**

**Salmonellosis**

Two four-day old lambs from a flock of 100 ewes were submitted to Limerick with a history of weakness since birth. Some 15 lamb deaths had been reported from the flock. Post mortem examination revealed the presence of pulmonary and hepatic congestion in both lambs. *Salmonella Typhimurium* was isolated from both. Three ewes were submitted to Limerick from one farm where they had been thriving poorly, not eating well and shivering before death, were all found by Limerick to have severely damaged livers associated with fasciolosis. *Salmonella* Dublin was isolated from the liver of one of the ewes.

**Further Observations**

*Salmonella* Dublin was isolated from a number of young calves, lambs and faecal submission to Limerick during the month. *Salmonella* Dublin was also isolated from two sets of aborted lamb foetuses submitted to Limerick. A pure growth of *Klebsiella oxytoca* was isolated from a milk sample taken from a cow with clinical signs of mastitis.

**NORTH-EAST REGION**

**BOVINE**

**Abortion**

Chlamydophila abortus placentalis was diagnosed using immunohistochemistry in two full-term stillborn calves in a dairy herd of 440 (Fig 8). Both dams were first time calvers. The head was out in both cases but parturition was not progressing and therefore needed assistance. *Chlamydophila abortus*, the cause of enzootic abortion of ewes, causes sporadic abortion in cattle. Most abortions occur near the end of the last trimester, but they can occur earlier. There may be an association with contact with sheep.

**Abortion**

Dublin investigated an abortion problem in a 400-ewe flock in which there had been 21 abortions over a period of approximately two weeks. On gross post mortem examination there was a diffuse placentalis affecting the cotyledons. Histopathology confirmed a necrotising and supplicative placenta and multi-focal non-suppurative encephalitis, protozoal cysts consistent in appearance with *Toxoplasma gondii* bradyzoites were found within placental tissues (Figure 9). Immunohistochemistry showed positive staining for both *Toxoplasma gondii* and *Chlamydophila abortus*. Campylobacter was also isolated from stomach contents. This case identifies a flock where multiple infectious abortifacients are present.

**CALVES**

*Salmonella* Septicaemia due to *Salmonella dublin* was diagnosed in one-week-old dairy calves with pneumonia, fever, panting and swollen joints. No abortions were reported. In some herds *Salmonella dublin* infection may become endemic in neonatal calves. Disease is maintained by carrier animals shedding bacteria in their faeces or milk, infected calves, rodents or a contaminated environment.

**OLDER BOVINES**

Dublin saw a nine-year-old cow with a history of depression and weight loss for three weeks ante mortem. Post mortem examination revealed that much of the right lung was consolidated and was adherent to the right thoracic wall due to dry pleural adhesions while the rest of the lung was emphysematous. *Mycoplasma bovis* and *Trueperella pyogenes* were isolated from the pneumonic lesion. Chronic pleuro-pneumonia was diagnosed with *Mycoplasma* spp. likely to have been the primary agent, *Trueperella pyogenes* is regarded as an opportunistic secondary invader of lungs.

**OVINE**

**Abortion**

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LAMBS
A case of emphysematous and suppurative abomasitis was diagnosed in a four-week-old Texel lamb, the fifth to die suddenly in the field. Differential diagnoses for abomasitis include Clostridium sordelli infection and Clostridium septicum infection (braxy). FATs for both organisms, which are soil-borne, were negative. Braxy is typically associated with cold weather and has been postulated to be due to ingestion of frozen grass and hay which can cause abrasions of the abomasal mucosa. Bacteria subsequently gain access to the underlying tissue through these abrasions, proliferate; produce gas and toxins that cause necrosis.

FURTHER OBSERVATIONS
Bacillus licheniformis was isolated from abomasal contents of a bovine aborted foetus and a weak born calf submitted to Dublin RVL. This has been associated with epizootic abortion and has been postulated to be due to ingestion of frozen grass and hay which can cause abrasions of the abomasal mucosa. Bacteria subsequently gain access to the underlying tissue through these abrasions, proliferate; produce gas and toxins that cause necrosis.

CALVES
Bovine neonatal pancytopenia (BNP) was diagnosed in two calves less than three weeks of age from two different farms with histories of excessive bleeding from ears after tagging and bleeding from mouth and rectum. Diagnosis was made on histology, which showed tri-lineage hypoplasia of bone marrow consistent with BNP in a BVD negative animal.

Calf Diarrhoea
A large number of faecal samples from young diarrhoeic calves were tested during the month. Rotavirus (29.6%) was the most frequently detected agent followed by Cryptosporidia (24.2%).

OLDER BOVINES
Lymphoma
Lymphoma was diagnosed by histopathology in a 20-month-old bull with multifocal raised white circular <1cm lesions in the renal cortices and pulmonary plaques. The animal had a concomitant liver abscess.

OVINE
Abortion
There were submissions of ovine foetuses from 56 flocks during the month. Toxoplasmosis followed by enzootic abortion of ewes were the most frequently diagnosed causes accounting for 34% and 16% of submissions respectively.

OLDER SHEEP
A three-year-old ewe was presented with a history of poor thrive. Grossly, the left kidney was massively enlarged and the normal architecture of the kidney was replaced by solid calcified gritty material (Photos). Carcinoma was diagnosed on histological examination.

FURTHER OBSERVATIONS
At the end of February 2013, there had been no confirmed cases of Schmallenberg virus in foetuses. Many foetuses bearing a variety of deformities were tested but none confirmed as positive. A number of young calves submitted to Athlone RVL bore evidence of abomasal ulceration, perforation and peritonitis. While in the main, this is recognised as a dietary issue, in one case, Aspergillus species was deemed to have borne an active role. Pasteurella/Mannheimia bronchopneumonia was diagnosed in a number of young calves submitted to Athlone RVL. In one case, BVD virus was demonstrated in lung tissue taken from the animal. Multiple cases of listeriosis was found in ewes. Multiple cases of subacute/chronic active faciolisis was found in ewes. There were a marked number of animals submitted, both lambs and calves, with peritonitis, joint-ill and other sequelae seen as a result of navel infections. Bloods were submitted from 66 calves to test for immunoglobulins; 51.5% of them indicated good colostral transfer while the remainder reflected suboptimal gastrocolial transfer. Similar findings were made in neonatal lambs submitted. Peritonitis was seen in perinatal cows. In one case, it was secondary to a uterine tear in a two-year-old cow with a history of assisted delivery. In another, it was as a result of an abomasal perforation in a cow that had had a caesarean section. Liver fluke eggs were detected in 19.8% of bovine faecal samples examined, while rumen fluke eggs were detected in 52.1% bovine faecal samples examined at Athlone RVL. These figures are increased significantly from February 2012 when 4.8% and 36.8% of samples respectively contained eggs. This indicates continuing high levels of infections in cattle.