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REGIONAL VETERINARY LABORATORIES REPORT

NOVEMBER 2013

OVERVIEW

BOVINE

There was a total of 134 bovine carcases examined in the RVLs during November. Pneumonia was the most common diagnosis, accounting for 41 cases. The frequency of occurrence of infectious agents associated with pneumonia is detailed below:

Table 1: The most commonly diagnosed causes of bovine pneumonia seen in the veterinary laboratory service in November 2013 (n=41).

<table>
<thead>
<tr>
<th>Agent</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dictyocaulus viviparus</em></td>
<td>15</td>
</tr>
<tr>
<td>RSV</td>
<td>6</td>
</tr>
<tr>
<td><em>Pasteurella multocida</em></td>
<td>5</td>
</tr>
<tr>
<td><em>Mannheimia haemolytica</em></td>
<td>4</td>
</tr>
<tr>
<td><em>Trueperella pyogenes</em></td>
<td>4</td>
</tr>
<tr>
<td>Parainfluenza virus</td>
<td>1</td>
</tr>
<tr>
<td>Bovine Coronavirus</td>
<td>1</td>
</tr>
<tr>
<td>IBR</td>
<td>1</td>
</tr>
<tr>
<td>No agent identified</td>
<td>4</td>
</tr>
</tbody>
</table>

Enteritis also featured prominently as a cause of death during November accounting for 23 of the cases that were submitted for post mortem.

There were two cases of bovine neonatal pancytopaenia recorded during November – one case by Sligo RVL and another by Dublin RVL. The calves in both cases were two weeks of age which is the age at which this condition is most commonly identified.

Clostridial diseases were a prominent cause of mortality during November. Five separate cases of blackleg were seen, two cases of malignant oedema, one case of black disease and one case of emphysematous abomasitis. The blackleg cases were all recorded in weanlings and *Clostridium chauvoei* was isolated from four of the cases. There were five cases of parasitic gastroenteritis recorded. All animals were between four and nine months of age.

Kilkenny and Dublin recorded a single case each of abomasal ulceration – in a cow and weaning respectively while Kilkenny also recorded abomasal ulceration and perforation in a two-month-old calf.

The results of 88 calf faecal package tests performed in the RVLs during November are presented in table 2.

Table 2: The aetiological agents of neonatal diarrhoea seen in samples submitted to the veterinary laboratory service in November 2013.

<table>
<thead>
<tr>
<th>Agent</th>
<th>No. tested</th>
<th>Percentage positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotavirus</td>
<td>88</td>
<td>29.5%</td>
</tr>
<tr>
<td><em>Cryptosporidium spp.</em></td>
<td>88</td>
<td>20.5%</td>
</tr>
<tr>
<td><em>Salmonella sp.</em></td>
<td>86</td>
<td>1.2%</td>
</tr>
<tr>
<td>Coronavirus</td>
<td>88</td>
<td>0%</td>
</tr>
<tr>
<td><em>Escherichia coli</em> K99</td>
<td>65</td>
<td>0%</td>
</tr>
<tr>
<td><em>Campylobacter jejuni</em></td>
<td>81</td>
<td>8.6%</td>
</tr>
</tbody>
</table>

Ovine:

Parasitic gastroenteritis (PGE) was the most common cause of mortality in sheep recorded in the RVLs during November accounting for 35% of cases examined. In many cases, multiple lambs were presented to the RVLs from the same farm. All lambs examined in which PGE was diagnosed were between six and eight months of age.

There were just two diagnoses of acute fasciolosis in sheep which contrasts with the same period last year. Both diagnoses were made by Sligo RVL in yearling hoggets.

Ruminal acidosis was a relatively common diagnosis during November, possibly reflecting the sudden introduction of concentrates in this month. There were six cases of ruminal acidosis from three flocks recorded by Sligo RVL and Kilkenny RVL. The Kilkenny cases were in three ewes from the same flock while Sligo recorded cases from eight-month-old lambs from two different flocks.

Clostridial disease featured prominently as a cause of death in sheep during November. Pulpy kidney was the most common manifestation with four cases recorded (two in seven-month-old lambs and two in yearling hoggets) while Braxy was diagnosed by Sligo in a four-year-old ewe.
CURRENT FINDINGS

MIDWEST REGION

BOVINE

Abortion

Forty-seven bovine foetii were submitted to Limerick RVL for post-mortem examination, along with six foetal stomach contents by post. 
*Salmonella* Dublin was isolated from 11 out of 53 cultures, or just under 21%. Over the same period in 2012, this agent was isolated in three out of 73 cases, or 4%, and in 2011 two out of 77 cases (almost 3%). The other bacterial abortificants *Bacillus licheniformis*, *Listeria monocytogenes*, alpha-haemolytic streptococci and *Trueperella pyogenes* were all isolated from one case each, as was an *Aspergillus sp*. Of 46 samples of thoracic fluid, tested for *Neospora* antibodies, four were positive, and of 44 samples tested for Leptospira antibodies eight were positive.

Weanlings

Thirteen weanlings were submitted to Limerick RVL during November, and all were examined under the protocol of the 2013 RVL weanling pneumonia survey. Three of these animals had gross signs of enteritis and extremely high trichostrongyle eggs per gram (epg), in one case as high as 10,000 epg. One of these had concurrent *Dictyocaulus viviparus* infection detected by Baermann’s technique. A fourth animal had both a high trichostrongyle egg count and a diffuse pneumonia, with lungworms visible in numbers in the trachea. In another case of weanling pneumonia no parasites were found but *Pasteurella multocida* was isolated. One weanling had blackleg. The remaining seven animals in this age group had gross PM signs of enteritis, but the aetiology was not determined. Bacterial enteric pathogens were not cultured, and parasitic egg counts were below significant levels. One of these enteritis cases also had a chronic rumenitis, which may have been a predisposing factor. Respiratory signs were detected in three of these animals but were deemed to be of less significance then the GIT lesions. Bovine respiratory syncitial virus (BRSV) was detected by PCR in the lungs of two animals.

OTHER SPECIES

Necrotic enteritis

A four-year-old horse was submitted to Limerick RVL with a history of diarrhoea and depression for a few days before death. The referring practitioner was very suspicious of acute larval cyathostomosis. Necrotic enteritis was disclosed at post mortem along with hepatic congestion and pulmonary hypostatic congestion. Histopathology disclosed numerous strongyle larvae in mucosa of the small intestine, and necrotising colitis with thrombosis, suggestive of bacterial infection, such as salmonellosis or clostridial infection. No significant bacterial pathogens were isolated possibly reflecting antimicrobial therapy prior to death. However, the presence of strongyle larvae in the mucosa of the intestine would suggest that endoparasites did indeed play a significant role in the death of the animal.

FURTHER OBSERVATIONS

An atrial septal defect was disclosed on examination of a Limousin calf with a history of slowness to rise since birth. A two-year-old heifer was found to have gross signs of enteritis. A heavy burden of coccidial oocysts was detected in the caecal contents.

SOUTH EAST REGION

BOVINE

Congenital

Patent *Ductus Arteriosus*

A 17-day-old calf was presented to Kilkenny RVL with a history of severe dyspnoea and respiratory distress of extremely acute onset. On post mortem, there was severe hepatoedema present (nutmeg liver) with rounded edges evident on the margins of the liver. Within the lungs, there was severe pulmonary oedema, interlobular septal oedema, with oozing of fluid from the cut surface. There was a large volume of fluid (approximately 2 pints) of fluid in the thorax upon opening. Upon examination of the heart, there was a patent *ductus arteriosus* present which although had narrowed, it had not closed fully (Fig 1). Laboratory findings revealed no additional significant findings. A diagnosis of patent *ductus arteriosus* with secondary pulmonary and hepatic congestion was made.

Calves

Colisepticaemia

An eight-day-old calf, which had a history of respiratory disease at a couple of days old, followed by digestive disturbance prior to death, was presented to Kilkenny RVL. At post mortem examination, colisepticaemia and agammaglobulinaemia was diagnosed (ZST = 1). There were accumulations of fibrin in the abdominal cavity and adhesions between adjacent loops of intestine (Fig 2), causing a bowel obstruction, leading to the reported digestive disturbance.

Figure 1. Photograph displaying the mild patent *ductus arteriosus* present in a 17-day-old calf that presented to Kilkenny RVL. (Photo William FitzGerald)
Weanlings
*Enteritis cystica profunda*
A seven-month-old bovine was found dead and 13 others from the group had diarrhoea. Post mortem examination showed thickening and oedema of the abomasal wall and thickening of the wall of the small intestine, which contained scant faeces of milk-like consistency. There were several small foci of cream-coloured raised lesions on the intestinal mucosa, often associated with Peyer’s patches. No evidence of paramphistomes (adults or larvae) was found. No significant bacteria were isolated and faeces contained 100 trichostrongyle epg. PCR was negative for BVDV. Histological examination of the intestine showed lesions suggestive of *enteritis cystica profunda*. This is a histological description that includes mucin-filled dilated intestinal glands. It is rarely seen in cattle (Veterinary Ireland Journal (2011) 1, (9), 511-513). There is no specific cause known but it is a differential diagnosis for diarrhoea/ill thrift in cattle. As so many cattle were affected, conditions such as Salmonellosis or gastrointestinal parasitism may be important predisposing causes.

**OVINE**

Older sheep
*Pulpy Kidney disease*
A one-year-old sheep found dead was presented to Kilkenny RVL. Other sheep in the group had also died suddenly. Gross examination revealed gross evidence of barley in the rumen and the contents of the small and large intestine were watery. A rumen pH of 5.3 was detected. A pH of less than 5.5 is indicative of rumenal acidosis. Interpretation of rumenal pH is complicated by the fact that the pH of the rumen contents begins to increase one hour after death (Veterinary Medicine, 10th Edition. Radostits, Gay, Hinchcliff, Constable). A strongyle egg count of 950 epg was detected. Histopathology revealed a microangiopathy in the brain, associated with serum lakes (Fig 3). This lesion is associated with clostridial enterotoxaemia (*pulpy kidney disease*). A diagnosis of clostridial disease (*pulpy kidney*), ruminal acidosis and parasitic gastroenteritis was reached. It was advised that clostridial vaccination should be reviewed in this flock.

**OTHER SPECIES**

Avian
*Septicaemia*
Two adult quail were submitted for examination to Kilkenny RVL. There were others reported dead in the flock. There were no obvious clinical signs reported. The main PM findings in both birds examined were that the livers were pale with ecchymotic haemorrhages visible on the cut surfaces. The spleens were enlarged. *Staphylococcus aureus* was isolated from multiple tissues taken from the birds. Materials submitted for testing for Newcastle Disease and Avian Influenza viruses were negative. A diagnosis of *Staphylococcus aureus* septicaemia was made and this was supported by histopathological findings. Stress factors may predispose to this disease. The disease is associated with spondylitis and osteomyelitis also.

**FURTHER OBSERVATIONS**

Parasitic gastroenteritis was diagnosed in a lamb aged eight months. It and many of its comrades were thin and diarrhoeic. Faecal examination showed 30,000 trichostrongyle epg in a liquid faeces sample. It transpired that due to some misunderstanding lambs had been underdosed with an anthelmintic.

**NORTH WEST REGION**

**BOVINE**

Calves
*Vertebral fracture*
Sligo RVL discovered a fractured lumbar vertebra, in a five-day-old calf that had shown inco-ordination and lordosis since birth, said to be a difficult calving. The calf was hypogammaglobulinaemic and there was a concurrent rotaviral enterocolitis resulting in dehydration and death. Fractures of the thoracolumbar vertebrae are an uncommon consequence of delivery by traction and usually involve the use of calving jacks.
Bovine Neonatal Pancytopenia (BNP)
Sligo RVL had one case of bovine neonatal pancytopenia (‘Bleeding Calf Syndrome’) in a two-week-old pedigree Charolais calf. The herdowner had a previous case the year before. Post-mortem examination revealed a very pale carcass with a focal periscapular haematoma and multifocal petechiations and ecchymoses. Characteristic tri-linear stem cell hypoplasia was observed on histopathology of bone-marrow. BNP is found in neonatal calves up to three-weeks-old. There is usually low morbidity but clinical cases are invariably fatal.

Weanlings
Iatrogenic malignant oedema
Sligo RVL diagnosed iatrogenic malignant oedema in a six-month-old weanling that developed gangrenous myositis and cellulitis in a hind quarter with subsequent toxaemia and death. An anthelmintic had been administered in that region, two weeks previously, by intramuscular injection (instead of subcutaneous). Herdkeepers should be made aware of the risks in injecting animals with faecally saturated hides and should pay extra attention to sterility in such cases, and consider using oral treatments instead.

OLDER ANIMALS
Black Disease
Sligo RVL had a case of infectious necrotic hepatitis (‘black disease’) in a three-year-old cow that had been housed on slats. She was discovered recumbent with a painful grunt and died two hours later before therapy could be administered. A solitary pale hepatic infarctive type lesion with a haemorrhagic border and pathognomonic for the condition was discovered on post-mortem examination. Clostridium novyi was demonstrated in impression smears of the lesions. Vaccination of bovine and ovine cohorts is recommended in areas where the disease occurs.

OVINE
Older sheep
Acute fascioliasis
Sligo RVL necropsied two hoggets from separate flocks that had pathology associated with acute fascioliasis. Such is the damage to the hepatic parenchyma by the migrating larvae in heavy infestations that the whole liver becomes very friable. Handling or moving of the sheep can result in hepatic rupture and severe acute, fatal intra-abdominal haemorrhage. In a lot of cases the death is witnessed by the shepherd during animal movement or handling. This condition has been infrequently detected this autumn, a sharp contrast with last year, associated with contrasting weather conditions in the grazing season.

Ruminal acidosis
Sligo RVL diagnosed acute ruminal acidosis as the cause of death in two fat lambs presented for post-mortem examination. The flock has been recently introduced to a concentrate diet rich in flaked maize. The feeding systems allowed some lambs to consume more. The history was of acute diarrhoea and dehydration. Upon examination, the rumens were expanded, containing a foul-smelling semi-liquid material with a pH less than 5.0.

Suppurative pericarditis
Sligo RVL had two cases of suppurative pericarditis in sheep on the same day in November (Fig 4). A three-year-old ewe died suddenly after a history of pining. Trueperella pyogenes was isolated from the lesions.

Figure 4. Photograph illustrating suppurative pericarditis seen in a three-year-old ewe submitted to Sligo RVL (Photo: Colm Ó Muireagáin).

FURTHER OBSERVATIONS
Sligo RVL diagnosed spontaneous uterine rupture with fatal intra-abdominal haemorrhage in a four-year-old cow that was eight months pregnant. These rare cases are almost always associated with heavily pregnant cows suddenly falling after slipping. Icy conditions during winter months add to the risk of moving dry cows to calving quarters.

Sligo RVL had two cases of listerial meningoencephalitis in adult ewes in November. One ewe had a history of head-tilting, collapsing and shaking but the other was described as a sudden death.

Sligo RVL diagnosed acute peritonitis associated with a perforated abomasal ulcer in a two-year-old ewe in good condition that was found lying on its side and urolithiasis in a nine-month-old ram lamb with ascites.

NORTH EAST REGION
BOVINE
Weanlings
Clostridial myositis
Two seven-month-old weanlings were submitted to Dublin RVL with a history of having been found dead. Examination of one weanling revealed dark red moist lesions (Fig 5), deep in the musculature of the hindquarters and along the back, and deep within these moist lesions, the muscle was dark, dry, friable and porous. Examination of the second weanling revealed similar dark dry porous change affecting the musculature over the right thorax, including the right intercostal muscles. A diagnosis of Blackleg was made in both cases based on the characteristic pathological change encountered in muscle tissue and the detection of Clostridium chauvoei at the lesion site using FAT.
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Figure 5. Photograph depicting lesions characteristic of clostridial myositis seen in a nine-month-old weanling (Photo: Maresa Sheehan)

OTHER SPECIES

Foreign body
Twine used to seal bags of feed was found wrapped around the base of the tongue in 9-week old turkeys. The twine was pulled taut ending in a ball of fibre either in the oesophagus, proventriculus or gizzard. The neck of the largest bird was noticeably kinked due to the linear foreign body.

Lymphocytic proventriculitis
Lymphocytic proventriculitis was diagnosed in unevenly growing broilers where there was gross evidence of proventricular erosion/ulceration. Differential diagnoses included transmissible viral proventriculitis, malabsorption/running and stunting syndrome, Marek’s disease and mycotoxins. Transmissible viral proventriculitis (TVP) is an important cause of production losses in broiler chickens, resulting in impaired growth, poor feed conversion, and impaired feed digestion. Additionally, this disease causes enlargement of the proventriculus and a tendency of the organ to rupture at processing resulting in increased processing costs. The cause of this disease is a new, previously unrecognised birnavirus of chickens. This virus was shown to be antigenically and genetically distinct from other birnaviruses.

Avian Encephalomyelitis
Marek’s disease (MD) was suspected in 19-week-old unevenly-growing table egg layers with depressed appetites and intakes which were brought on farm at 18 weeks of age. One bird had evidence of avian encephalomyelitis (AE) (Fig 6). The flock had been vaccinated at 11-weeks-of age against AE and at one-day-old against MD. A drop in egg production was noted in 35-week-old birds on the site (egg quality was unaffected). The consistent pathological finding in both age groups was marked lymphocytic proventriculitis with lymphocytic infiltrates mainly in the mucosa, submucosa and occasionally in myenteric ganglia. The methods of preventing MD are vaccination, good flock management, cleaning, disinfection and biosecurity. Avian encephalomyelitis is an unusual finding in adult birds but may be seen two to three weeks following vaccination

with a poorly attenuated vaccine. In this investigation, the single AE affected bird may have been immunosuppressed due to MD making it more susceptible to AE following vaccination.

Figure 6. Photomicrograph illustrating neuronal degeneration (black arrows) in a 19-week-old layer with suspected avian encephalomyelitis (Photo Ann Sharpe).

FURTHER OBSERVATIONS

A two-week-old calf with a history of acute depression and bleeding from an injection site was submitted to Dublin RVL. Gross examination revealed an anaemic carcass. Examination of the thorax revealed the lungs to be pale and extensive haemorrhage was evident on the epicardium. Examination of bone marrow revealed trilineage hypoplasia of haemopoetic cells, a finding consistent with bovine neonatal pancytopenia (BNP).

SOUTH WEST REGION

BOVINE

Older bovines
Caudal vena cava syndrome
Cork RVL performed a post mortem examination in a one-year-old heifer which had been found dead. Gross examination revealed haemorrhage in the right cranial pulmonary lobe and random multifocal small abscesses throughout the pulmonary parenchyma (embolic pneumonia). Further examination revealed a liver abscess. The pulmonary thromboemboli were produced by a ruptured liver abscess (5cm diameter) into the caudal vena cava (Fig 7). A large quantity of swallowed clotted blood, presumably form the lungs, was found inside the rumen and along the trachea.
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OTHER SPECIES

Johne’s Disease

A selection of tissues from a milking goat that died after a period of anorexia were submitted to Cork RVL for histological examination. Microscopic examination revealed diffuse cytoplasmic vacuolation of the hepatocytes (hepatic lipidosis, ketosis). In addition to this finding, the intestine was diffusely thickened with prominent rugosae. Dense sheets of large macrophages with fine granular cytoplasm admixed with lymphocytes and neutrophils (granulomatous inflammation) were observed in the intestinal mucosa and submucosa. Ziehl-Neelsen (ZN) stained sections demonstrated large numbers of acid-alcohol-fast bacilli consistent with Johne’s disease (Fig 8). Further investigation of this herd is in progress.

Figure 7. Photograph highlighting multifocal randomly distributed white foci surrounded by haemorrhagic halo (embolic pneumonia) in the pulmonary lobes, as a result of caudal vena cava syndrome. (Inset) liver abscess (Photo: Cosme Sánchez-Miguel).

Figure 8. Photomicrograph illustrating acid-fast Mycobacterium-containing macrophages (arrows) in the small intestine of a goat with Johne’s disease (Photo: Cosme Sánchez-Miguel).