Surveillance Newsletter

Spring 2022

It is the time of year where the Veterinary Pathology Centre (VPC) is becoming busier with referrals from several large animal veterinary surgeons, and the cases related to abortion, stillbirth and neonatal disease are increasingly prevalent. In this Spring 2022 newsletter, we aim to give you various updates, including on diarrhoea outbreaks in adult dairy cows, Schmallenberg virus (SBV), and an alert system to keep you up to date with regional and national endemic disease, as well as a roundup of some interesting diagnostic cases.

We would like to welcome Dr Josue Diaz-Delgado DVM PhD DACVP to the team. He is an ACVP-boarded anatomic pathologist and has worked extensively with farmed animal species, most recently at Texas A&M University in the USA. Whilst also contributing to the surveillance scheme, he will take an active role in training the anatomic pathology residents and veterinary students in the school.

Finally, we would like to say a massive thank you to Louise Ryan who will be leaving the centre at the end of March. Louise has worked tirelessly to help all referring vets submit cases and deliver a fantastic level of support to ensure accurate data collection for the UK surveillance. Whilst we are extremely sad to see Louise leave the centre, we are excited for the next step in her career, and we are fortunate in that Jae Kingswell will be taking on this valuable role. Jae has worked both at the Veterinary Pathology Centre and Veterinary School, and already comes to us with some experience of dealing with surveillance cases. Within this issue, Louise says a personal farewell to you all.

We would like to wish all our clients a successful 2022 breeding season and remain available to assist with farm animal post-mortem diagnostics.

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Within this newsletter we bring you updates on:

- **DIARRHOEA OUTBREAKS IN ADULT DAIRY COWS**
- **SCHMALLENBERG VIRUS: AN UPDATE**
- **FREE ENDEMIC DISEASE ALERT SYSTEM**
- **A BIG 'THANK YOU' FROM LOUISE RYAN**
- **Interesting cases** to include**:**
  Sudden death in a grower sow due to mesenteric torsion
  Acute death in a group of Highland cows due to Yew toxicosis

DIARRHOEA OUTBREAKS IN ADULT DAIRY COWS

Over recent weeks, there have been reports of diarrhoea in more than 20 housed dairy herds in England, Wales, and Scotland. The pattern of acute onset diarrhoea, with variably severe milk drop, is suggestive of 'winter dysentery'; however, other possible causes, including nutritional factors, should also be considered.

Winter dysentery

Winter dysentery is a highly contagious disease that is caused by bovine coronavirus infection (Hodnik and others 2020). It most commonly occurs early in the housed period, usually affecting adult cattle, but with up to 100% of the herd (including youngstock) sometimes developing signs. Most have watery diarrhoea, but in some herds, as the name suggests, there is a more dramatic presentation with bloody diarrhoea or dysentery. Affected animals are rarely pyrexic, although there may be malaise, loss of condition and reduced appetite. The disease outbreak spreads rapidly, and clinical signs in individuals usually resolve spontaneously in two to three days. A significant reduction in milk yield is commonly reported. Mild respiratory disease, such as coughing, has also been reported. Mortality is uncommon.

Recent cases

Veterinary investigation centres have reported that, on the affected farms, up to 50% of the adult herd has been affected, with a reduction of around 4 to 7 litres of milk production per cow. Most have recovered after a few days without treatment, although some cows have become very sick and been treated with oral fluids and non-steroidal anti-inflammatories. In some herds, Salmonellae have been isolated from affected animals; however, the pattern of the disease outbreak spreading through the herd, and the associated clinical signs, are not considered typical of salmonella infection as the primary cause.

Testing for infectious diseases

Coronavirus is shed in faeces, however, due to the dilution factor in adult cows, and also because virus shedding largely precedes clinical signs, antigen ELISAs on faeces are often negative. Antibodies to coronavirus are common in cattle, so single sample serology is unhelpful, whereas paired serology can detect rising antibody titres in blood samples collected three to four weeks apart. Sampling at least five or six animals is recommended. Other infectious causes of a herd diarrhoea outbreak which should also be considered include bovine viral diarrhoea (BVD) and Schmallenberg virus (SBV) infection (although SBV infection would be unexpected at this time of the year as it is spread by insect vectors). Testing acute blood samples by polymerase chain reaction (PCR) can be done for both infections, or paired serology can be undertaken. Infection by Salmonellae is also possible, and bacteriology on faecal samples is recommended. Clinicians can still make use of sending samples direct to APHA test centres via the Animal Disease Testing Service (ADTS) (https://animal-disease-testing.service.gov.uk/login)

Non-infectious causes

Feed-related causes are also to be considered and investigated as causes of diarrhoea. Sudden changes of constituents, spoilage such as caused by moulds, and too-high inclusion rates of concentrates (which precedes the development of ruminal acidosis) can all contribute. Potential management and nutritional factors should be investigated.

Although there are several recognised causes of herd outbreaks of diarrhoea, we must remain vigilant to the possibility of novel diseases. In Holland, the increased numbers of herds with diarrhoea, accompanied by milk drop and pyrexia, enabled the Dutch Veterinary Surveillance teams to identify SBV infection when it first emerged more than 10 years ago.

Please contact the APHA Veterinary Investigation Centres, or us here at the VPC, to discuss cases further.

Reference Hodnik JJ, Ježek J, Starič J. Coronaviruses in cattle. Tropical Animal Health and Production 2020;52:2809-2816 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7367658/
Figure 1: Seasonality of outbreaks of winter dysentery diagnosed in England, Wales and Scotland 2012-2021 (Veterinary Investigation Diagnosis Analysis [VIDA])

SCHMALLENBERG VIRUS: an update

During 2022, the Animal and Plant Health Agency (APHA) will again offer free of charge testing of samples from lambs, kids and calves born with arthrogryposis or other musculoskeletal deformities.

A fresh brain sample (brain stem is preferred) will be tested free of charge, if submitted to APHA veterinary investigation centres. Please contact the Veterinary Pathology Centre (VPC) or your local veterinary investigation centre for more information and to discuss appropriate sampling, or the submission of a foetus with placenta. The submission of a foetus and placenta may be preferable to investigate other causes of abortion, in addition to Schmallenberg Virus (SBV).

The detection of the virus in brain tissue is dependent on the stage of gestation that the foetus became infected, and therefore a polymerase chain reaction (PCR) test may be negative despite SBV involvement. Therefore, in addition, serum samples can also be submitted from up to 6 cows/heifers, or 6 ewes, including the dams of aborted calves/lambs, to test for antibodies to SBV.

Further information on sampling for investigation of cattle and sheep abortions is available in the diagnostic handbook, also on the APHA Vet Gateway:

Livestock & Wildlife Disease Diagnosis at APHA (defra.gov.uk) (Cattle: Pages 27-28, Small Ruminants: Pages 35-36)

Information on investigating small ruminant abortions can also be found in this focus article in the Veterinary Record:

- Investigating abortions in small ruminants (2020) Veterinary Record 186, 116-117

Image A.

Image B.

Examples of the gross pathology exhibited in calves and small ruminants (sheep and goats) affected by Schmallenberg virus (SBV). In the first image (A), there is a noticeable kyphosis and scoliosis, as well as long limbs which often are unable to flex or extend through the limb articulations (arthrogryposis); (B) shows marked forelimb flexural contraction and arthrogryposis. Mild brachygnathia inferior (shortening of the mandibular bone relative the maxilla) is also seen.

Images courtesy of https://influentialpoints.com/Gallery/Schmallenberg_Virus.htm

FREE ENDEMIC DISEASE ALERT SYSTEM FROM APHA

Livestock keepers and veterinary surgeons are encouraged to sign up to the free endemic disease alert system for farm animals. Through this system, you will receive timely national and regional alerts of disease (including notifiable disease) direct to your email and mobile phone. To sign up send an email to siu@apha.gov.uk or visit https://www.gov.uk/guidance/apha-alert-subscription-service#how-to-subscribe-for-disease-alerts

GOODBYE FROM LOUISE RYAN: VPC COORDINATOR

I wish to bid a fond farewell to all of our clients and colleagues that I have worked with over the last seven years. From the vets in the field grappling with bad signal when I was bombarding them with clinical history questions, to the wonderful practice receptionists I

spoke with, sometimes near daily- thank you for your patience, joviality, and perpetual support! – Louise

INTERESTING CASES

SUDDEN DEATH IN A GROWER PIG CAUSED BY MESENTERIC TORSION

A 7-month-old grower from an outdoor herd was submitted to the Veterinary Pathology Centre after 6 animals in a group of 50 (from a herd of 900) suddenly died. Whilst there was extensive vaccination in the herd, there had been no reported changes to management including diet.

On post-mortem examination the abdomen was diffusely distended and tympanitic. The peritoneum contained a small to moderate amount of dark red, malodorous fluid with yellow friable strands (septic peritonitis). The mesentery holding the jejunum, ileum and colon exhibited an approximate 180 degrees clockwise (dorso-ventral view) torsion. The affected intestinal segments were diffusely enlarged, dark red and filled with gas, and the vasculature was engorged (intestinal venous infarction and ischaemic necrosis). Numerous 1 to 2 cm in diameter rounded stones were present within the lumen of the stomach and colon; lesser numbers were seen within the small intestine. The mesocolon was markedly expanded by yellow gelatinous fluid (mesocolonic oedema).

The cause of sudden death in this sow was a **severe, segmental, acute intestinal mesenteric torsion with infarction, ischemic necrosis, and secondary septic peritonitis**. These findings are typically observed in swine haemorrhagic bowel syndrome. In this particular case, a readily evident predisposing factor was the large number of stones, primarily present throughout the spiral colon and the stomach. Mesenteric volvulus occurs commonly in swine and can be a common cause of sudden death (Jubb et al, 2016). Animals have distension of the abdomen and on opening of the abdominal cavity there are characteristic dark red to black distended loops of intestine (as observed in this case). There is no single, proven cause for intestinal mesenteric volvulus. Factors believed to contribute to torsions and volvulus include: rapid ingestion of a large amount of feed or water (as with once per day feeding), overly crowded pens with associated piling and competition for feeder space, use of highly fermentable ration ingredients that produce excessive amounts of gas in the stomach or colon, and advanced pregnancy. Review of the dietary management for growing and finishing pigs in this herd would be advised.

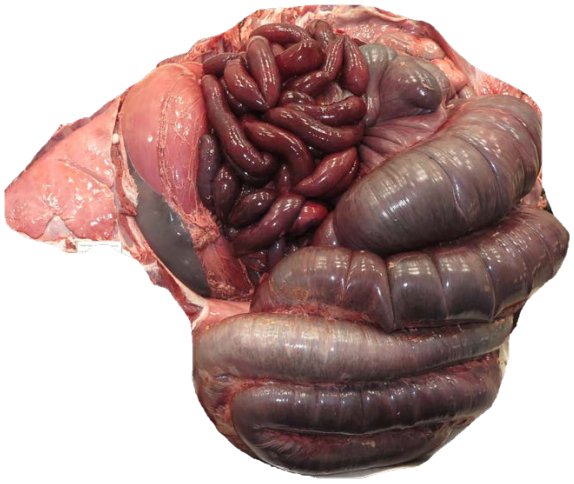

Image C. **Image D.**

Image C shows the mesenteric torsion with distended, dark red loops of small and large intestine. Image D shows the content of the spiral colon with numerous 1-2cm diameter stones.

TWO SUBMISSIONS OF HIGHLAND COWS WITH SUDDEN DEATH FROM YEW (TAXUS BUCCATA) TOXICOSIS

The VPC has received two separate submissions (one of 5 deaths and the other of 3 deaths) of sudden deaths in groups of Highland cows from different herds. Within the groups, some individuals were noted to be ataxic, dyspnoeic, and dying shortly afterwards. No sheep had been co-grazing, and anthrax testing was negative.

In both submissions, the rumen of each animal contained abundant stems and masticated, dark green, waxy, up to 2.5x0.2cm leaves (consistent with *Taxus buccata*; common yew) admixed with rare, dull green, lobed, with distinct light green vein leaves (consistent with *Hedera helix*; common ivy), pale green fibrous material, and liquid ingesta (pH 5.0 [normal rumen pH 6.0-7.0]). The abomasum and proximal small intestine also contained a small amount of *T.buccata.*

Yew poisoning has been recognised in livestock and humans for hundreds of years. In ruminants, microbial degradation of taxines in the rumen is considered important. Yew plants contain a heterogenous mixture of cardiotoxic alkaloids; the major constituents being taxine A and taxine B. Taxine B and its derivatives constitute the main and most toxic group. Taxines act as calcium and sodium channel antagonists within cardiac myocytes and may induce cardiac arrythmia, atrioventricular block and diastolic cardiac arrest. Death through acute heart failure normally occurs in less than 24 hours. However, in cattle, a subacute to chronic intoxication lasting up to 18 days has been reported. As such, remaining animals in the herd who have access to *Taxus* spp. should be carefully monitored. Careful examination of common grazing should be performed, and appropriate fencing and avoidance of contaminated areas should be encouraged.

Image E.

An example of the copious Common Yew (Taxus buccata) within the rumen content of multiple Highland cows

References:

1. Wilson CR, Sauer J, Hooser SB. Taxines: a review of the mechanism and toxicity of yew (Taxus spp.) alkaloids. Toxicon. 2001 Feb-Mar;39(2-3):175-85. doi: 10.1016/s0041-0101(00)00146-x. PMID: 10978734.
2. Handeland K, Vikøren T, Josefsen TD, Madslien K, Valdecanas B, Uhlig S. Yew (Taxus) intoxication in free-ranging cervids. PLoS One. 2017 Dec 27;12(12):e0188961. doi: 10.1371/journal.pone.0188961. PMID: 29281648; PMCID: PMC5744921.

For further information on the services and facilities provided at the VPC please visit our website. Please call us on **01483 689823** to submit any cases using the submission form found here.