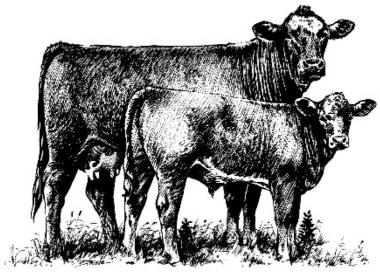
Animal & Plant Health Agency



SRUC

GB cattle quarterly report

Disease surveillance and emerging threats

Volume 28: Q1 January – March 2021

Highlights

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Introduction and overview

This quarterly report reviews disease trends and disease threats for the first quarter of 2021, January - March. It contains analyses carried out on disease data gathered from APHA, SRUC Veterinary Services division of Scotland's Rural College (SRUC) and partner postmortem providers; and intelligence gathered through the Cattle Expert Group networks. In addition, links to other sources of information including reports from other parts of the APHA and Defra agencies are included. A full explanation of how data is analysed is provided in the annexe available on GOV.UK
https://www.gov.uk/government/publications/information-on-data-analysis

Issues and trends

New Postmortem Providers join APHA's Scanning Surveillance Network in England and Wales

The APHA's postmortem examination and diagnostic testing service provides a major component of the GB scanning surveillance network. The network works closely with vets and farmers to detect and investigate new or re-emerging disease and diagnose endemic diseases in farm animals.

The APHA Surveillance Intelligence Unit and Surveillance and Laboratory Services Department are very pleased to announce that during January and February 2021, three additional postmortem examination (PME) providers have joined the scanning surveillance network. These are the Universities of Cambridge, Liverpool and Nottingham.

This broadens the expertise of, and contributors to, livestock disease surveillance in England and Wales and also brings livestock premises in the areas they cover closer to a postmortem provider.

The new PME providers join the seven current PME Providers (Royal Veterinary College, Universities of Surrey, Bristol, Cambridge and Liverpool, the Wales Veterinary Science Centre, and SRUC Veterinary Services St Boswells) that work together with the six APHA Veterinary Investigation Centres (VIC), all of which will continue their valued contribution to scanning surveillance.

Key points about accessing PME in APHA's scanning surveillance network:

- Each PME Provider has an assigned area as shown in colour on the map on this link: http://apha.defra.gov.uk/documents/surveillance/maps/england-wales-map20.pdf
- Within each assigned area, the hatched area shows where premises are eligible for free carcase collection and delivery of animals to the PME Provider
- Premises within non-hatched areas need to arrange to deliver animals themselves

- The postcode search tool identifies and provides contact details for the allocated PME provider and indicates if the premises is eligible for free carcase collection. This is based on the postcode of the premises from where an animal is to be submitted rather than a veterinary practice: http://apha.defra.gov.uk/postcode/pme.asp
- To arrange a PME, the vet calls the relevant PME provider to speak to the duty VIO/vet
- There will be some livestock premises for which the allocated PME provider has changed, and the free carcase collection service may no longer be provided for some holdings. The APHA postcode search tool allows farmers and vets to see the situation for individual premises.

More information about APHA's scanning surveillance and diagnostic services is available on Vet Gateway (link) below and in the attached farmer and vet information leaflets which include a map showing the PME sites.

http://apha.defra.gov.uk/vet-gateway/surveillance/index.htm

Please do let me know if you have queries which are not addressed in this communication, or contact the APHA Surveillance Intelligence Unit SIU@apha.gov.uk for more information.

Weather

Wintry conditions occurred in the first week of January, with the high ground of northern England and Wales affected by snow. Storm Christoph swept across the country on 20th to 21st January, causing significant flooding problems. February was wetter with rainfall 16% of average overall, but this was followed by a dry March (**Figure 1**). While this was good for calving, the subsequent grass growth was poor. The current parasite forecasts suggest that these wet and dry periods, and temperature fluctuations (**Figure 2),** are likely to have an impact on the patterns of parasite larval burdens in Q2 2021.

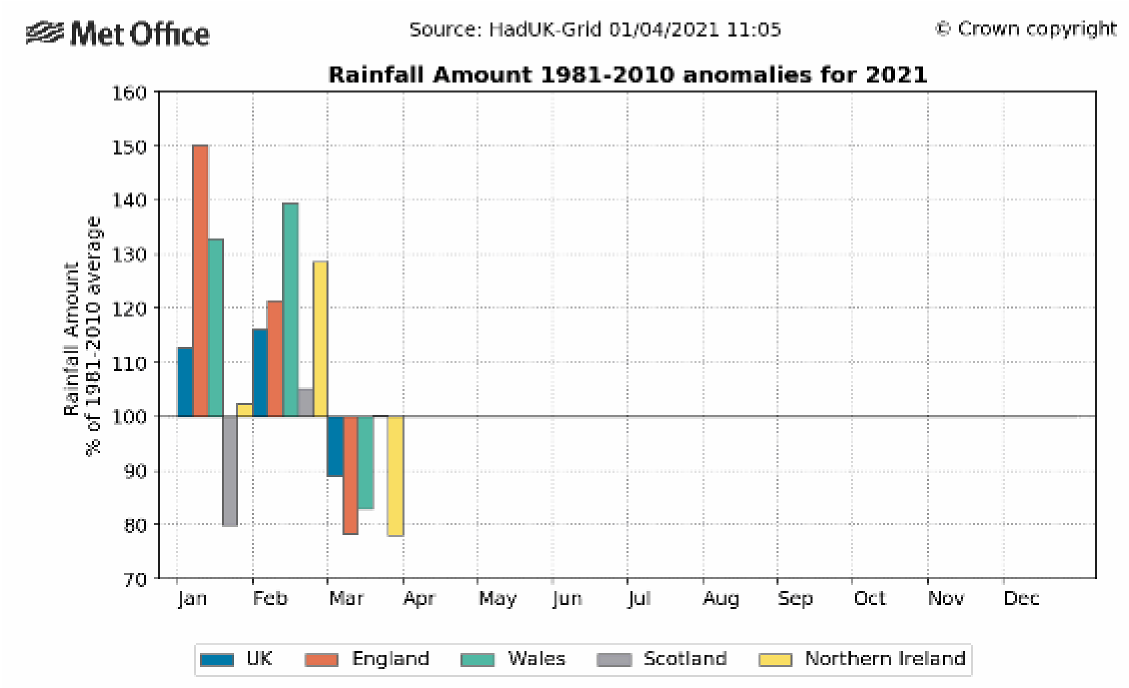

Figure 1 Rainfall amount 1981-2010 anomalies for Q1 2021

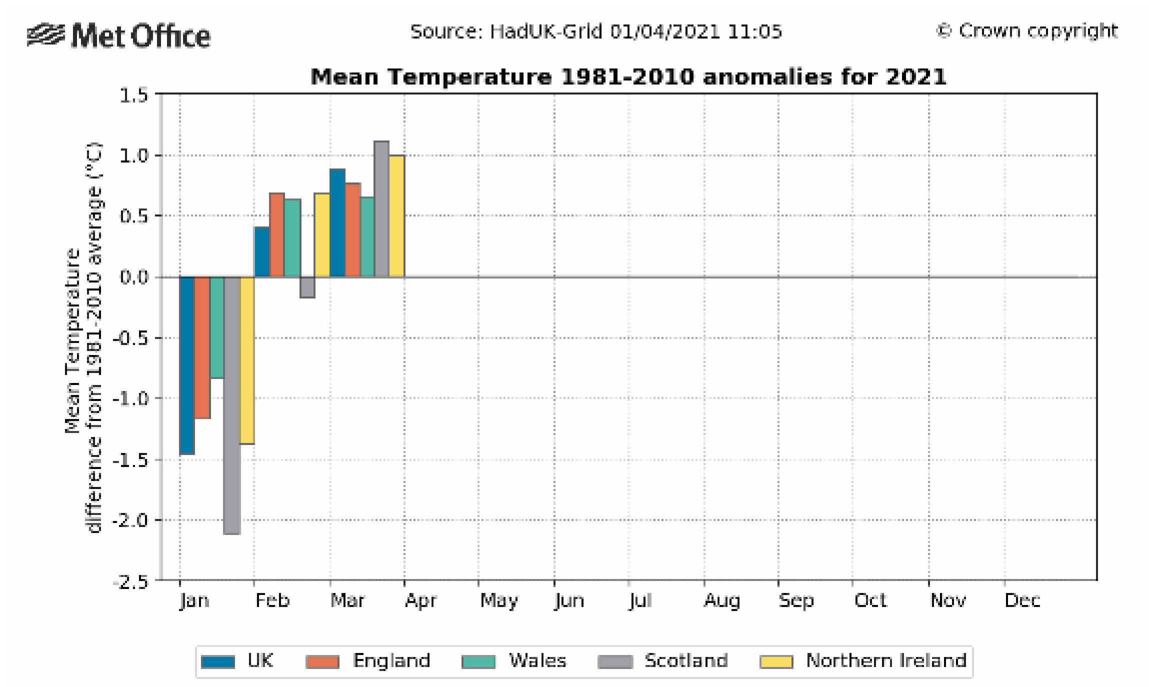

Figure 2 Mean temperature 1981-2010 anomalies for Q1 2021

A recent meeting of companion animal vets, reported in the Veterinary Record, suggests that ticks are likely to be detected all year round in the UK due to climate change.

Loeb J (2021) **Ticks are now a year-round problem.** Veterinary Record 188 (9) 326-327

https://doi.org/10.1002/vetr.460

Beef update

Beef markets generally moved from strength to strength in early 2021, with average prime prices continuing to increase through January. After steadying in February, they still remained around 34ppKg (~10%), above five-year averages, and well ahead of 12-months previous. When prime prices steadied (at a good price), cull cow prices started to rise. This is typical for the early months, as cheaper manufacturing beef demand increases after Christmas.

It wasn't long before prime prices rose further however, and by the end of March the average price was getting close to 400ppKg. Reduced throughput (1.7% down on 2020), with continuing strong and growing retail demand, drove the high prices.

New and re-emerging diseases and threats

Schmallenberg virus enhanced surveillance

Like other orthobunyaviruses, Schmallenberg virus (SBV) typically shows three-to-five-year cycles of infection. Therefore, SBV was anticipated to cause disease in 2020/21, following its previous identification in the UK in 2012/13 and again in 2016/17. APHA has been offering free of charge SBV surveillance testing for small ruminants and cattle during the spring 2021 lambing and calving seasons. The findings from this enhanced surveillance will be reported later in the year. Three cases, for which SBV testing was undertaken, are discussed below.

Case 1 - A two-day-old crossbred Aberdeen Angus calf, from a herd of 140 dairy cows, was euthanased because it had a spinal deformity and had struggled to stand and suckle, although it was born unassisted. Postmortem examination (PME) at APHA Shrewsbury VIC showed marked scoliosis of the lumbar spine (**Figure 3),** but the limb joints had a full range of movement. Arthrogryposis, which is a characteristic feature of in utero SBV infection, between 80 and 150 days of gestation in cattle, was not present. The brain and the spinal cord were grossly unremarkable. Fibrinous polyarthritis and omphalitis, reflecting post-natal bacterial infection, were identified, and the anus was imperforate. Polymerase chain reaction (PCR) testing on the brain confirmed SBV infection, however histopathology did not identify necrosis and dysplasia of the ventral horn of the spinal cord, which the characteristic lesions of SBV, in the affected lumbar spine instead, diplomyelia (duplication) of the lumbar spinal cord was present, the cause of which is uncertain and is considered most likely a spontaneous congenital malformation. There was also a mild non-suppurative encephalitis, which may reflect late gestational SBV infection.

Figure 3 Scoliosis of the lumbar spine of a two-day-old calf

Case 2 - A four-day-old heifer from a 550-cow dairy herd was also examined for SBV infection at APHA Shrewsbury VIC. It was euthanased because it exhibited generalised weakness. No gross brain or spinal cord pathology was present and there were no significant musculoskeletal lesions. A PCR test on brain tissue did not detect SBV. Histopathology identified a multifocal non-suppurative encephalitis and myelitis, with a few suspect protozoa, in addition to asymmetric dysplasia of the sacral cord. Subsequent PCR testing of the brain confirmed *Neospora caninum* infection. The nature of the non-suppurative encephalomyelitis was suggestive of possible protozoal and viral infection; and therefore, in this case, it was considered that a combination of neosporosis and SBV infection may have accounted for the central nervous system lesions. Other potential viral causes had been ruled out.

Case 3 - A veterinary practitioner delivered a calf, which had schistosomus reflexus malformation, by caesarean section, in a small herd of 10 suckler cows. The next calving was reported by the farmer to have been unassisted, with one live normal calf and one abnormal calf delivered per vaginum. The vet was concerned about possible SBV infection and the abnormal calf was submitted for examination. The gross pathology in this calf was again consistent with schistosomus reflexus malformation **(Figure 4)** and the SBV PCR test proved negative. There has been debate about the cause of schistosomus reflexus and a 20-year study in Australia concluded that it was likely to be a spontaneous defect with no breed association (Knight 1996). There are also reports of twins with one affected and one normal calf, as in this case.

Figure 4 Calf with malformation typical of schistosomus reflexus

Since detection of the virus in the fetal brain depends on the stage of gestation when the fetus became infected, a negative PCR test does not rule out in utero infection. The real-time PCR test is less sensitive for cattle than it is for sheep; and only a relatively small proportion of SBV infected calves are PCR positive. In some cases, testing of serum samples from a representative number of cows, including any that have aborted (particularly with characteristic gross pathological changes in the calf), is indicated, in order to detect antibodies to SBV in the dam.

Knight RP. The occurrence of schistosomus reflexus in bovine dystokia. *Australian Veterinary Journal* 1996;73:105-107

Salmonella Typhimurium DT 116 incidents in cattle

During Q4 2020, five incidents of *Salmonella* Typhimurium DT 116 in cattle were identified. Four of these were in North Wales and one was in England, which was also linked to equine infections. Four human cases were also identified in a similar area of North Wales, although the epidemiological links of these human and cattle cases are still being investigated. On the worst affected farm, 30 cows out of 750 exhibited clinical signs including diarrhoea, malaise and milk drop over a short time period associated with block calving and 17 of these cows died, although no *Salmonella* was isolated from calves and illness in the herd resolved spontaneously before the introduction of vaccination. The potential sources of the infection included bought-in cows, wild birds (particularly seagulls), waste bread used as a feed source (which can also lead to digestive disruption) and human carriage of the infection, possibly amplified by rodents and feral cats which were noted as being problematic on the farm. The impact of disease on the other farms was limited, and no further animal or human cases have been reported since November 2020. More information on salmonellae in cattle in the UK can be found at the link below.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/917011/salm-livestock-prod-gb19.pdf

Changes in disease patterns and unusual diagnoses

Digestive system disease

Cryptosporidiosis

Cryptosporidiosis was diagnosed in 20% of the submissions, for which it was tested, in Q1 2021. This was a higher rate than the previous four years for Q1, which had been 16% of diagnosable submissions for Q1 2017-2020 **(Figure 5).**

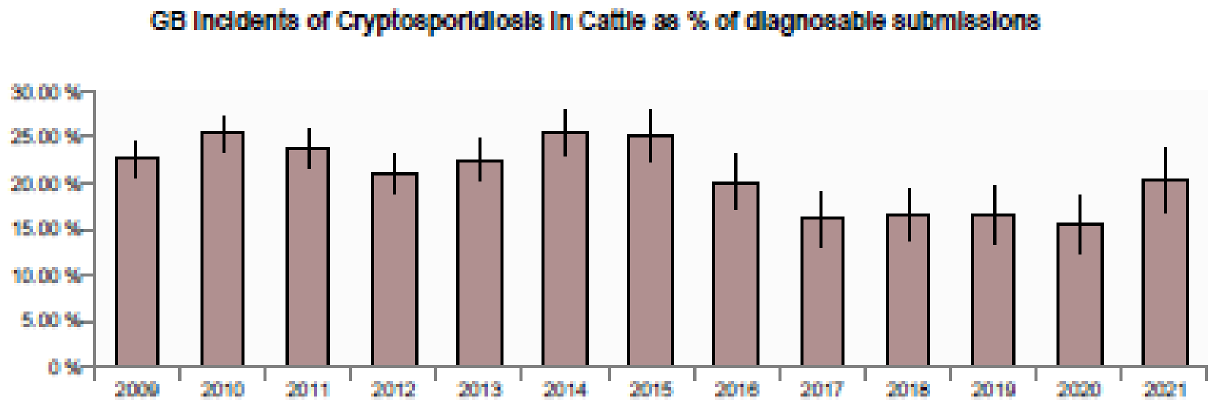

Figure 5 GB incidents of Cryptosporidiosis in cattle as % of diagnosable submissions for Q1 2009-2021

The Moredun Research Institute have recently undertaken some research on cryptosporidiosis and control of this disease. There are helpful farmer information sheets on control of this disease at the link below:

https://www.moredun.org.uk/research/diseases/cryptosporidiosis

Abomasal disorders

APHA has reported an increase in abomasitis cases in calves over the last two quarters compared to previous years – this was discussed in the report for Q4 2020. The following risk factors are important to consider when investigating abomasal disorders:

- has optimal colostrum management been ensured?
- has the milk powder been reconstituted to the correct dilution?
- is the milk fed at the correct temperature?
- are the teats clean and undamaged and minimise the risk of over-fast drinking?

- is the quantity of milk fed regulated so that calves are not overfed or receive varying amounts?
- is there fresh water and suitable forage provided?

This report also discusses abomasal disease in calves:

https://www.vettimes.co.uk/article/increasing-incidence-of-abomasal-disease-in-calves/

Possible Idiopathic Necrotic Enteritis in a 12-week-old suckler calf

A 12-week-old Belgian Blue cross suckled calf was reported to be not thriving for three weeks. It was observed be ataxic when walking, did not want to suck and it had difficulty breathing and pale yellow/white sclera.

Significant postmortem findings were a pale carcase, tracheitis, pneumonia, pleuritis, pericarditis, oral and gastrointestinal tract ulceration **(Figure 6),** pale kidneys and hair loss with scaling on the head and shoulders.

Figure 6 Oral ulceration in a calf with suspected Idiopathic Necrotic Enteritis

Histopathology of intestine, kidney and sternal haematopoietic tissue demonstrated lesions that could be consistent with Idiopathic Necrotic Enteritis (INE). There was a notable lack of neutrophils and other leukocytes, suggesting a fundamental impairment of innate immunity/inflammatory response, and hypoplasia/atrophy of the sternal haematopoietic tissue, which has been reported in cases of INE. This is a disease of spring born suckler calves usually aged 6-12 weeks old, has a similar presentation to mucosal disease and the aetiology is unknown. Ulceration is usually seen in the mouth, oesophagus, fore stomachs and intestine.

Coronavirus enteritis

Two outbreaks of enteritis in unweaned calves were associated with coronavirus infection. One case was diagnosed by postmortem examination of a 2-week-old Holstein-Friesian heifer. It was the third calf of a group of 20 to develop scouring over a period of one week. The calves were given colostrum for the first five feeds, using a teat on a bucket, and then they moved onto reconstituted milk powder twice daily. Halofuginone was administered for the first 3 days. Gross findings were haemorrhagic enteropathy and peritonitis. Coronavirus and cryptosporidia were detected in the intestinal content. The coronavirus infection was considered the most likely reason for the haemorrhagic enteritis, as the virus causes damage to the crypt epithelial cells in the small and large intestine. Peritonitis is an uncommon sequel.

Respiratory system

In Quarter 1 of 2021, compared to previous years, we have noticed an increase in diagnoses of interstitial pneumonia in Scotland, in both dairy and suckler herds and across all age groups. The overall numbers are small and therefore not statistically significant at this point. The cattle group will continue monitoring the trend.

Scotland has also seen a significant increase in other respiratory pathogens in Quarter 1 of 2021 compared to previous years. The percentage of diagnosable submissions, where a diagnosis of pneumonia due to *Mycoplasma bovis* **(Figure 7),** *Mannheimia haemolytica* **(Figure 8)** and IBR have been reached, is at an all-time-high for Scotland this quarter, compared to the same quarter of previous years. The situation is mirrored by APHA (and therefore GB figures) only in the case of *M. haemolytica.*

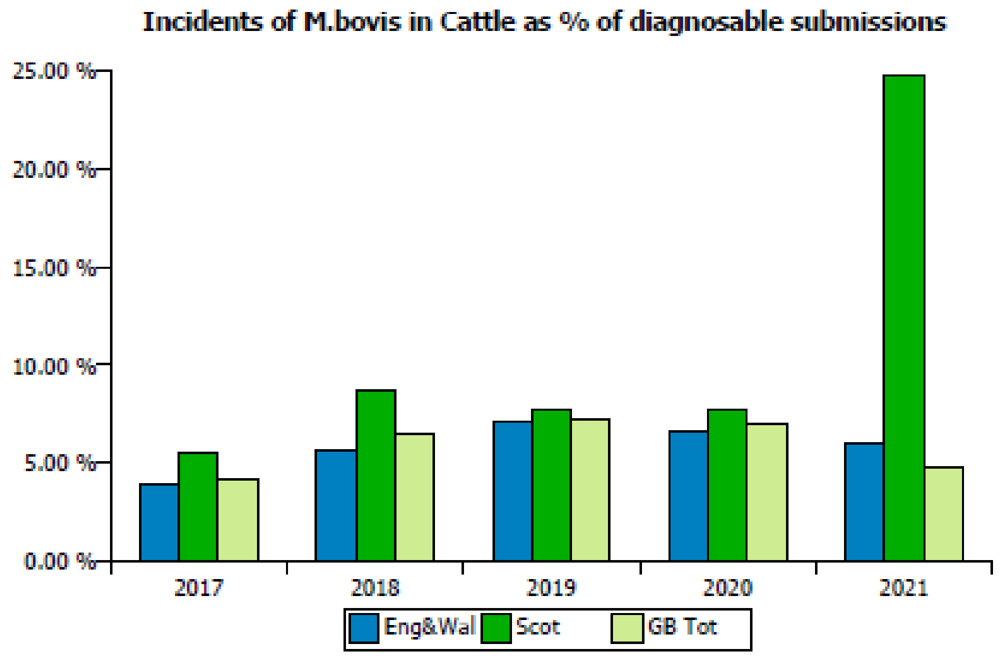

Figure 7 GB Incidents of Mycoplasma bovis in cattle as % of diagnosable submissions for Q1 2017-2021

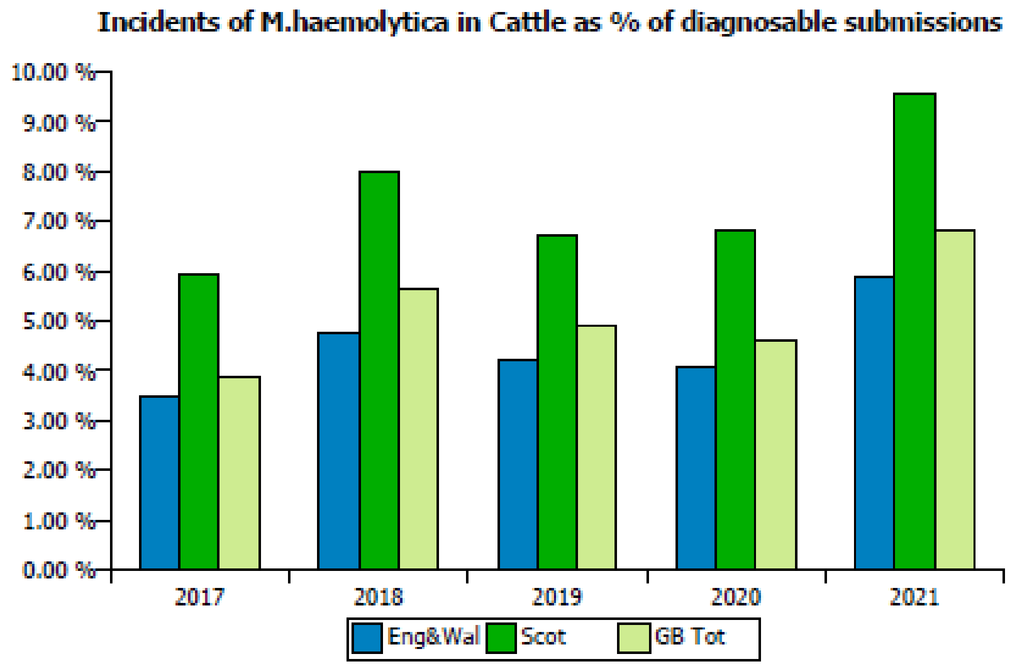

Figure 8 GB Incidents of Mannheimia haemolytica in cattle as % of diagnosable submissions for Q1 2017-2021

Systemic IBR and cryptosporidiosis in a pre-weaned dairy calf

A 14-day-old calf, from a 150-cow dairy herd, was submitted to investigate the cause of respiratory signs and death in four similarly aged pre-weaned calves. This calf initially showed respiratory signs at five-days-old, which gradually worsened despite treatment.

Significant postmortem examination (PME) findings included poor bodily condition, navel infection, swollen liver with white pinpoint lesions, lung consolidation and opacity of both lenses. *Cryptosporidium* spp. was detected in faeces, and Bovine herpesvirus 1 (BovHV-1), the cause of IBR in cattle, was detected by PCR from the respiratory tract.

It is unusual to detect IBR in an animal of this age, and follow-up histopathology was requested by the Cattle Expert Group as part of on-going surveillance. Histopathology of the liver demonstrated a multifocal, necrotising hepatitis, which given the PCR results, was suspected to represent BovHV-1 infection. This was confirmed by immunohistochemistry. Only minor, terminal changes were apparent in the lungs, and lung tissue tested negative for BovHV-1 on immunohistochemistry. These histopathological findings indicate systemic infection with IBR, which can occur spontaneously in neonatal calves, either due to congenital infection or due to infection shortly after birth. Calves with failure of passive transfer are especially susceptible, and disease can be prevented by feeding colostrum from vaccinated dams. Co-infection of BVD and systemic IBR has been previously demonstrated in calves. Lens opacities can occur as a result of viral, nutritional or toxic insults between 30-60 days gestation, when the lens is forming. Further investigation into the BVD and IBR status of the herd was recommended.

Disseminated adenocarcinoma in an adult dairy cow

A 9-year-old dairy cow was examined postmortem from a herd of 120 cows. It had exhibited increased respiratory effort and nasal discharge in the last 10 days before it died, despite symptomatic treatment using antibiotic and NSAID. Multiple caseonecrotic lesions varying in size from 2mm to 50mm, which were white or yellow, were present throughout all the lung lobes (**Figure 9).** There were also similar lesions in the thoracic lymph nodes. Some of the lesions had a ‘gritty’ (calcified) texture when incised **(Figure 10).**

Figure 9 Multiple white or yellow masses within the lungs of a dairy cow; these were confirmed by histopathology to be an adenocarcinoma

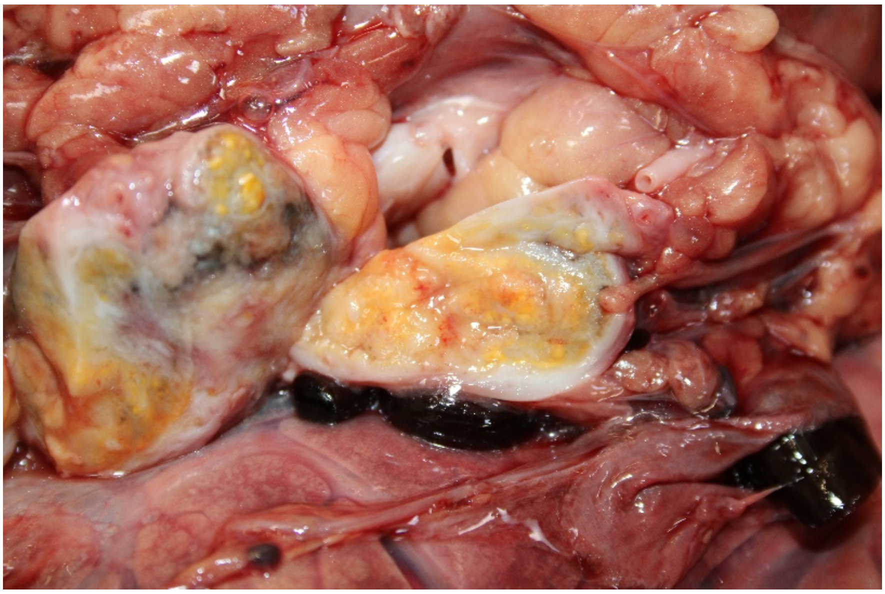

Figure 10 A sectioned mass with a caseonecrotic centre and a fibrous capsule

Bovine tuberculosis was suspected and the APHA Field Services were informed. Samples from the lesions were collected and sent for mycobacterial culture, which proved negative. Histopathology was undertaken and revealed that the lesions were a disseminated neoplasm of epithelial origin, most likely an adenocarcinoma. All neoplasms in cattle, except haemangiomas, papillomas or warts, should also be reported to APHA Field Services to rule out the possibility of enzootic bovine leucosis (EBL).

Nervous System

There were several interesting nervous system / nervous signs cases in Q1 2021.

Axonopathy in dairy heifers

Three of a group of 18 dairy calves, aged approximately 6 months, in a herd of 190 cows, were noticed to develop an unusual high-stepping type of gait, slight tremor and ataxia. The tail head was also raised and the worst affected had difficulty rising from being recumbent. The two worst affected were euthanased and examined postmortem. No significant gross pathology was detected other than enlargement of the costochondral junctions in one, and anteroventral lung consolidation in the other; the brains and spinal cords were unremarkable. Histopathology identified an axonopathy in the spinal cords of both animals. The cause is uncertain. Such changes could arise with focal compressive lesions, such as vertebral body trauma or osteomyelitis, but none was identified and would be unlikely in two animals. Other possibilities are toxicity (in the past organophosphates were associated with such pathology), or metabolic or genetic disorders. The heifers were being reared on a home-mix ration, and a metabolic deficiency was considered the possible cause. A review of the diet was going to be undertaken.

Encephalitis of unknown aetiology in a 22-month-old fattening steer and a 10-month old beef heifer

A fattening steer aged 22 months had exhibited a rapid onset change in behaviour including aggression, with a paddling gait of the hind legs, leading to recumbency, prior to being euthanased. It was the only animal affected in a group of 15. There was no significant gross pathology found postmortem. Histopathology identified a multifocal non-suppurative encephalomyelitis and ganglionitis. These lesions were suggestive of viral infection; further testing by PCR for ovine herpesvirus-2 (OvHV-2) ruled out malignant catarrh, but the specific cause was not determined. Viral microarray will be used to investigate further. Astrovirus infection has previously been diagnosed in animals of this age with similar lesions.

A 10-month-old Belgian Blue heifer in a group of four animals was ill and had a temperature of 40ºC. She was treated with antibiotic and a NSAID, and there was a slight reduction of temperature to 39.6ºC the following day. Fluid therapy and multivitamins were also administered but by the evening it was difficult to open the animal’s mouth and signs progressed to include blindness, head pressing, and aimless walking even when haltered. The heifer died within 24 hours. None of the three other animals in the group was affected. No significant gross pathology was identified postmortem. Kidney lead assay and bacteriology were unremarkable. A moderate, multifocal, acute, necrotising, neutrophilic and lymphohistiocytic encephalitis was identified by histopathology. These lesions were unusual, but not indicative of a specific aetiology. The lesions had an angio-centric pattern suggestive of malignant catarrh, but the PCR for OvHV-2 was negative. Extensive molecular virological testing did not detect any other viruses in the brain. A protozoal infection (though no organisms were detected), or an unusual presentation of thrombotic meningoencephalitis (caused by *Histophilus somni*), cannot be ruled out, however the cause of the neuropathology remains undetermined.

Unusual brain lesions in an 18-month-old steer

An 18-month old Aberdeen Angus-cross steer was euthanased after a 3-month history of progressive salivation, drooling and weight loss. It had failed to improve when treated with penicillin and streptomycin. Actinobacillosis (‘wooden tongue’) was considered a possible cause, however there were no gross or histopathological lesions of the tongue, oral cavity or oesophagus. Moderate, multifocal, axonal degeneration and gliosis were identified in the brainstem in addition to congestion, perivascular oedema and haemorrhage in the grey matter and mild gliosis of the hippocampus. The histological changes were considered to be non-specific.

Congenital hydrocephalus in a Dexter calf

A full-term stillborn Dexter calf from a 27-cow herd was examined postmortem. Profound ataxia and opisthotonos were reported in the two previous calves born. The herd was not vaccinated against any infectious agents. The calf had a domed cranium and mild brachygnathia superior. The lateral ventricles of the cerebrum were markedly distended by cerebrospinal fluid (hydrocephalus) and the calvarium was moderately thickened.

Hydrocephalus is the abnormal accumulation of fluid in the cranial cavity; in this case the excess CSF was within the ventricular system (internal hydrocephalus). This congenital malformation may be inherited or acquired. The most commonly identified specific causes of acquired hydrocephalus in cattle are *in utero* infection by bovine viral diarrhoea virus (BVDv), bluetonguevirus (BTV) and Schmallenbergvirus (SBV). As bluetongue was a – potential differential diagnosis the case was reported to the APHA Field Services. PCR testing for BTV was negative, and subsequent testing for BVDv and SBV also proved negative.

At least six forms of congenital hydrocephalus have been identified in cattle. In congenital hydrocephalus, the site of obstruction is quite often not identifiable. The cavitating cerebral defects of hydranencephaly (where the brain’s cerebral hemispheres are thinned) and porencephaly (cysts or cavities in the cerebral hemisphere(s) are associated with internal hydrocephalus. In this Dexter calf it was considered likely to be an *ex vacuo* or compensatory hydrocephalus occurring due to a loss of cerebral tissue. Hydrocephalus also occurs in association with chondrodysplasias, especially in the ‘bulldog’ breeds of cattle. Type 5 hydrocephalus is one such form and has been reported in Dexter and Jersey cattle. The disease is a recessive trait with calves either aborted or stillborn. Animals that survive to term can also have arrested development of the nasal bones and maxillae (as in this case), achondroplasia, kyphosis and cleft palate.

Congenital hydrocephalus is frequently associated with malformation of the cranium as in this case. Whether cranial malformation occurs or not depends on the time of onset of the hydrocephalus relative to the degree of ossification of the cranial bones and the development and strength of the cranial sutures, as well as the rate at which the fluid accumulates. The lateral and third ventricles are usually the most severely affected. Extensive cranial malformation resulting from congenital hydrocephalus can lead to dystocia. Where increasing numbers of calves are being born with this defect, as on this farm, it is recommended to evaluate the genetics of the animals used for breeding.

Suspected hypomagnesaemia in weaned dairy calves

Tonic-clonic seizures and hyperaesthesia were reported in a 5-month-old dairy cross calf which died within 24 hours. It was the fourth similar case in calves accommodated in one pen over a period of around three months. The calves were fed clamp grass silage, top-dressed with biscuit meal and either brewer grains or an additive containing products from cereal and distilling industries. There was no gross or histopathological brain pathology. A discrete cranio-ventral pneumonia was present associated with *Histophilus somni* infection. Lead analysis on the kidney excluded toxicity. The aqueous humour magnesium was marginally low but not diagnostic.

A farm visit was undertaken. Blood samples were collected from 11 cohorts, including one animal which was reported to have previously had seizures, though did not die, and another which was observed to be hyperaesthetic and ataxic at the visit. There were marginally low serum magnesium concentrations in eight calves (0.6 to 0.8 mmol/l: reference interval 0.8-2.0 mmol/l), and low or marginal calcium concentrations in five 1.2-2.0 mmol/l; reference interval 2.0-3.0 mmol/l) (**Table 1)**. It was suggested that hypomagnesemia, possibly combined with marginal calcium levels, or other trace element issues, was the cause of the nervous signs. This was likely to be associated with variable dietary intake, and re-evaluation of feeding was recommended.

Table 1 Serum magnesium and calcium levels in the 11 calves with suspected hypomagnesaemia examined at the farm visit

Calf	History	Calcium (2.0-3.0 mmol/l)	Magnesium (0.8-2.0 mmol/l)
1	-	2.5	0.9
2	-	2.1	**0.8**
3	-	2.2	**0.7**
4	-	2.5	0.9
5	-	**2.0**	**0.7**
6	Ataxic/hyperaesthetic at visit	**1.8**	**0.6**
7	Frothing at mouth at visit	**1.9**	**0.8**
8	-	**2.0**	**0.7**
9	-	2.3	0.9
10	-	2.5	1.0
11	Past seizuring	**1.2**	**0.6**

Skin

Psoroptic mange in beef cattle

A group of 12-18-month-old, market-purchased, housed beef-finisher cattle was presented to the private veterinary surgeon with severe dermatitis. Clinical findings included hair loss, reddening and crusting of the skin along the back, extending from the shoulders to the tail head **(Figure 11).** Approximately 25 animals were affected and there were a further 125 in-contact animals. Skin scrapes, hair plucks and scab samples were taken and *Psoroptes* mites were identified at APHA Carmarthen VIC parasitology laboratory by microscopic examination **(Figure 12).** The *Psoroptes* species found in cattle, though indistinguishable from *P. ovis* in sheep, appears to be a cattle-adapted strain and has failed to establish in sheep (Mitchell and Damaso Peksa 2018).

One animal in the group, showing signs of ill-thrift and poor growth, tested positive for BVD virus by PCR. It was speculated that BVDv may have contributed to immunosuppression in the group, predisposing to a more severe mite infestation.

Figure 11 Hair loss, reddening and crusting of the skin along the back in cattle with Psoroptes mite infestation (Image courtesy of the practitioner)

Figure 12 Microscopic view of a Psoroptes mite from the affected cattle

Psoroptic mange is rarely reported in cattle in GB; there have been 19 VIDA diagnoses of *Psoroptes sp* in the last 10 years. It is reported to be common in some mainland European countries. Clinical signs are due to an allergic dermatitis and can be very severe. They include intense pruritus, exudative dermatitis, hair loss and marked weight loss. Signs tend to improve at turnout, but can recur when housed for the winter. Control is challenging as macrocyclic lactones (ML) are the only licensed acaricide for *Psoroptes* in the UK, but the response to treatment is often poor; and they are even less effective if applied topically. Resistance of *Psoroptes ovis* to macrocyclic lactones was reported by Wouter van Mol and others (2020) in Belgian Blue cattle.

Although MLs are the only licensed product, there is evidence to suggest that pour-on permethrin products are more effective. In this case, affected cattle were clipped and scabs removed, before three treatments with a pour-on permethrin solution were applied at fortnightly intervals following the cascade principles, with repeat skin scrapes examined microscopically to evaluate efficacy of treatment. Treatment of all in-contact animals was also advised by the private vet. It was not possible to move the animals to clean housing after treatment. Live *Psoroptes* mites were still detectable two weeks after the second treatment, but mites were not detected in skin scrapes after three treatments. Ten animals with severe lesions were also treated with meloxicam as an anti-inflammatory. Due to difficulties associated with treating this disease, it was advised by the private vet to slaughter the cattle before winter housing.

In this case treatment efficacy may have been reduced by the fact that the animals could not be moved to a clean environment after treatment. It can be hard to identify infected animals which are carrying a low number of mites and therefore this should be considered when buying-in new cattle from another herd.

Mitchell, S.& Damaso Peksa, A (2018) Important ectoparasites of sheep and cattle. *Veterinary Practice* https://veterinary-practice.com/article/important-ectoparasites-of-sheep-and-cattle

van Mol, W., De Wilde, N., Casaert, S., Chen,Z., Vanhecke, M., Duchateau, L. & Claerebout, E. (2020) Resistance against macrocyclic lactones in Psoroptes ovis in cattle. *Parasites & Vectors* 13:127

Reproductive system

The potential role of mollicutes in reproductive disorders in cattle

The Cattle Expert Group has recently been discussing the potential role of mollicutes in reproductive disorders in cattle, with the APHA Mycoplasma Department at Weybridge.

Mollicutes is a class of bacteria distinguished by the absence of a cell wall and include *Ureaplasma diversum*, *Mycoplasma bovigenitalium* and *Mycoplasma bovis* and they are reported to be associated with fertility and abortion problems in cattle. *M. bovigenitalium* and *U. diversum* have been isolated from the urogenital tracts of apparently healthy animals, yet are also associated with fertility problems and abortion (Doig, 1981, Petit et al., 2008, Hazelton et al., 2018); these organisms have also been implicated as opportunists in pneumonia and mastitis. *M. bovis* is a major pathogen of cattle causing pneumonia, arthritis and mastitis, but it also associated with disorders such as keratoconjunctivitis, otitis media, meningitis and abortion. APHA will be increased testing for the involvement of these organisms in bovine abortion investigations in the future.

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Centre of Expertise for Extensively Managed Livestock

The COEEML was developed by APHA to address potential surveillance gaps for extensively managed animals. Extensive management of livestock potentially makes regular, or close inspection, for checking stock and disease detection more challenging. The Centre is based at the APHA Veterinary Investigation Centre in Carmarthen however, it is a Great Britain-wide resource and forms part of the wider veterinary surveillance system operated by APHA.

On 9th December 2020, expert speakers from the fields of animal and human health came together to talk about tick-borne diseases, via a webinar organised by the APHA Centre of Expertise for Extensively Managed Livestock.

Paul Phipps, a scientist based at APHA Weybridge in the Wildlife Zoonoses and Vector Borne Disease Research Group, delivered the first talk describing the role of ticks as important disease vectors, and how their geographical range, abundance and period of activity seems to be changing in the UK.

- Paul Phipps - Virology APHA Weybridge – 'Tick borne diseases in livestock in the UK' - https://www.youtube.com/watch?v=4AmfItYs_Aw

Dr. Jolyon Medlock, the PHE Head of Medical Entomology, presented findings from the PHE national Tick Surveillance Scheme (TSS), which was established in 2005, to monitor tick distribution and seasonality on a nationwide scale.

Katie Lihou, a PhD student in the department of Veterinary Parasitology and Ecology at the University of Bristol, gave an overview of her research into the distribution and prevalence of ticks and tick-borne disease on sheep and cattle farms in Great Britain.

- Katie Lihou – PHD Student – University of Bristol - 'The distribution and prevalence of ticks and tick-borne disease in cattle' https://www.youtube.com/watch?v=FrSAxXTBoRw

Suzanna Bell, vector borne disease discipline champion within APHA and Veterinary Investigation Officer at APHA Shrewsbury, covered the diagnosis, treatment and management options for tick-borne diseases in livestock, including Tick-borne Fever, Louping ill, Redwater Fever (bovine babesiosis) and Tick pyaemia.

- Suzi Bell - APHA Shrewsbury – 'Tick borne diseases of livestock – Diagnosis and treatment' https://www.youtube.com/watch?v=pG5cYmaBwpg

To end the webinar we had two interesting case studies, firstly from Bev Hopkins, a Veterinary Investigation Officer at the Wales Veterinary Science Centre, who presented a case of high mortality in a sheep flock, caused by co-infection with Louping ill virus and Tick-borne Fever.

Harriet McFadzean, a Veterinary Investigation Officer at APHA Starcross, presented a case of Redwater Fever (bovine babesiosis) and Tick-borne Fever in a small beef herd in Dorset, associated with early and high burdens of ticks on pasture. Both cases demonstrated how significant losses can be incurred by cattle and sheep farmers as a result of tick-borne diseases.

- Bev Hopkins - Wales Veterinary Science Centre – Case study – 'High mortality in a sheep flock caused by coinfection with Louping ill virus and Tick Borne Fever' https://www.youtube.com/watch?v=6ahYJ0U1Nnk

- Harriet McFadzean - APHA Starcross – Case study – 'A tale of two tickborne diseases' https://www.youtube.com/watch?v=vtC1EIvX6dI

Chemical food safety

Acute fertiliser poisoning in a group of beef cattle

Eleven of a group of 12 Hereford-cross beef cattle aged 6 months were found dead. Two were examined postmortem after the practitioner completed an investigation for anthrax and ruled out this notifiable disease. The group had been vaccinated with a multivalent *Clostridium spp.* vaccine earlier that day and then turned out onto new grazing. A make-shift trough water source had been used to provide water for the animals. The two carcases were markedly bloated and had submucosal and intramuscular haemorrhages, and a necrotizing vasculitis in the trachea. Analysis of the drinking water in the trough revealed a total nitrogen concentration of >160mg/l and ammonium nitrogen of 12.6mg/l (the normal ammonium nitrogen concentration in drinking water is <0.05mg/l). It was subsequently discovered that the water trough had previously been used to store nitrogen-containing fertiliser (the exact product was never confirmed) which had caused toxicity when the water was consumed. Accidental, acute fertiliser poisoning results in the formation of excessive ammonia production in the rumen with rapid absorption into the circulation, overwhelming normal detoxification. Clinical signs usually occur within 30 minutes and can include agitation, ataxia, muscle tremors, excessive salivation, hyperthermia, regurgitation, laboured breathing and abdominal bloat rapidly followed by recumbency, convulsions and death.

Suspected urea toxicity in a group of cows

Two cows were examined postmortem during February to investigate the cause of sudden death. Eight cows had died in a group of 12 cows which were housed with calves at foot. The ambient temperatures had been below freezing for three days and the water supply to this group had frozen. An Intermediate Bulk Container (IBC) was filled by hosepipe with 1000 litres of water and all the group drank from this supply. Shortly after drinking the cows exhibited seizures, ruminal bloat, nystagmus and recumbency. Eight cows died within eight hours of drinking. Other cattle on the farm with an alternative water supply were not affected. It was then reported by the farmer that the IBC may have previously contained a detergent solution which was used for cleaning wagons/trailers. The cleaning solution contains 32.5% urea. It was considered likely that urea/ammonia toxicity was the cause of death. The clinical signs were consistent with hyperammonaemia, excess levels having been generated by the rumen.

The latest Chemical Food Safety report can be found at this link:

https://www.gov.uk/government/publications/chemical-food-safety-reports

Horizon scanning

Bluetongue (BTV) update

BTV in Europe October 2020 – March 2021 are shown in **Figure 13**. In March, in Europe, the following cases of BTV were reported:
Belgium: One case of BTV-8 in cattle was reported to OIE in March. Greece: In March, there were 13 reports of BTV-16 and 11 reports of BTV-4.

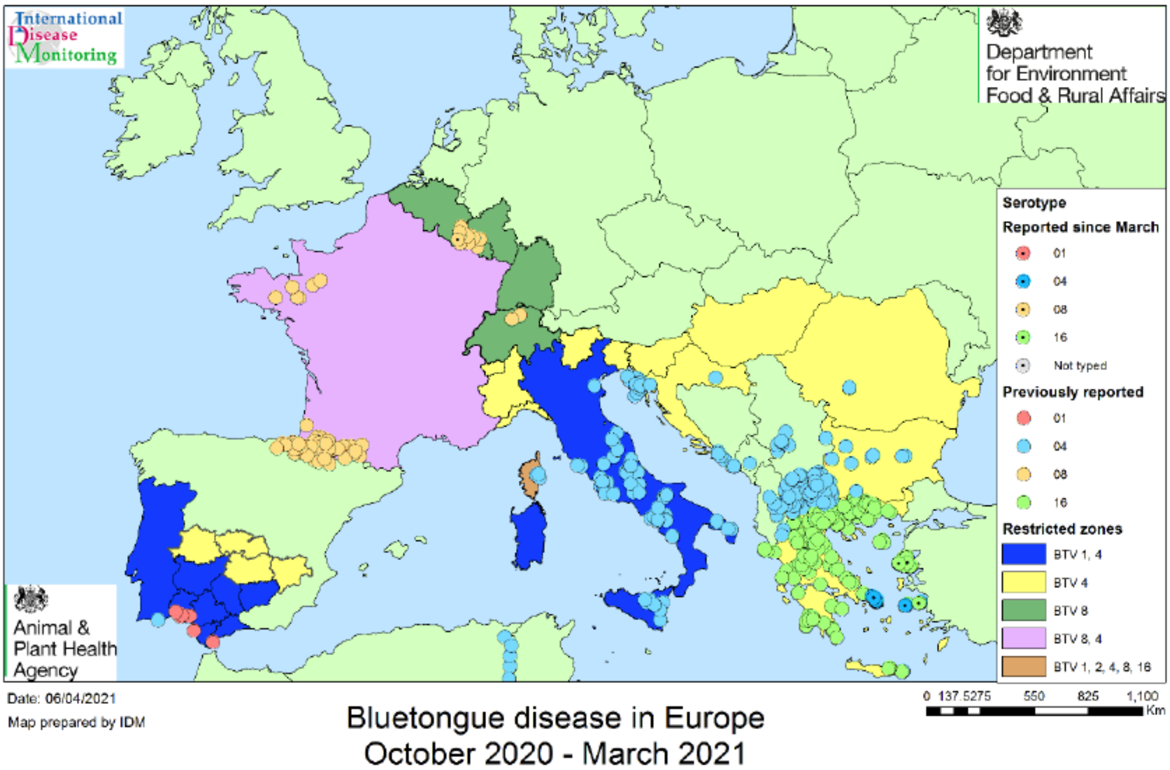

Figure 13: Bluetongue disease in Europe October 2020 – March 2021

https://www.gov.uk/government/publications/bluetongue-virus-in-europe

APHA have released a series of animations on Facebook and Twitter to inform keepers of BTV. https://www.facebook.com/APHAGov/

For more information, see the updated situation assessment, at:
https://www.gov.uk/government/publications/bluetongue-virus-in-europe

Publications

APHA Staff

FENEMORE, C., FLOYD, T. & MITCHELL, S. (2021) Rumen Fluke in Great Britain. Journal of Comparative Pathology 184, 31-36

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Other publications of interest

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Evans CA; Woolford L; Hemmatzadeh F; Reichel MP; Cockcroft PD (2021) Pathological lesions of lambs infected in utero with bovine viral diarrhoea virus type 1c (BVDV-1c). Veterinary Record 183 (3) 187-196

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Wernike, K. & Beer, M. (2020) Schmallenberg Virus: To Vaccinate, or Not to Vaccinate? Vaccines 8, 287

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