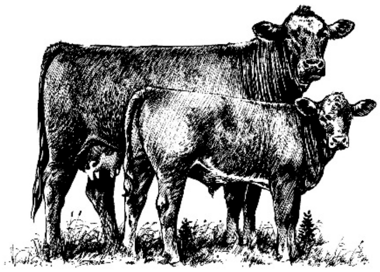
Animal & Plant Health Agency



SRUC

# GB cattle quarterly report

# Disease surveillance and emerging threats

## Volume 27: Q2 – April-June 2020

## Highlights

- **Hot and dry weather affected forage harvesting; potential for increased nematode parasitism as a sequel to this weather – page 2**
- **Outbreak of concurrent tick borne fever (*Anaplasma phagocytophilum* infection) and redwater (*Babesia divergens* infection) in a dairy herd – page 6**
- **Epistaxis in dairy cows associated with mycotic and BVD infections – page 9**
- **Pica in grass-based dairy herds – page 13**

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Editor: Arthur Otter, APHA Shrewsbury
Phone: + 44 (0) 208 0262580
Email: Arthur.otter@apha.gov.uk

# Introduction and overview

This quarterly report reviews disease trends and disease threats for the second quarter of 2020, April to June. 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

## Covid19

'Lockdown' measures introduced in Britain on 23rd March 2020 due to the global Covid19 pandemic continued through April and May with a gradual easing of restrictions subsequently announced in an effort to support the economy whilst still aiming to protect public health. Through lockdown all non-essential workers were required to stay at home and social distancing measures were implemented. Although farmers and veterinarians were identified as key workers, the effect of the requirement to implement social distancing affected the way some veterinary services were delivered. This had a greater impact on the small animal sector compared with farm animals, although there were considerable challenges to performing some on farm procedures such as TB testing and assistance during calving. There was an initial reduction in the amount of non-essential farm work, however surveillance activity continued at a steady rate.

APHA followed guidelines for risk assessment and safe working practices and there was effectively no disruption to the services across the network during the outbreak. All sites were assessed and have been designated to be safe working areas while Covid remains a threat. Practitioners are required to contact their local site, directed by the postcode finder (http://apha.defra.gov.uk/postcode/pme.asp) for triage of suitable cases and risk assessment.

Submissions to all laboratories have been reduced as a consequence of restrictions but APHA has continued to receive abortion submissions throughout the spring calving period. A surveillance focus update on bovine abortions was recently published and is available at https://veterinaryrecord.bmj.com/content/186/18/597.full?ijkey=0jzrYFEsuq7GM&keytype=ref&siteid=bmjjournals

## Weather

During the second quarter of 2020 the principal feature was a long period of dry and hot weather which began in late March and continued until June (Figure 1). The mean rainfall for the quarter was significantly reduced (Figure 2), and this resulted in short term forage shortages across much of England and Wales. This followed problems for some farmers being unable to get onto fields to spread slurry and manure after the very wet February, and this delayed early grass growth.

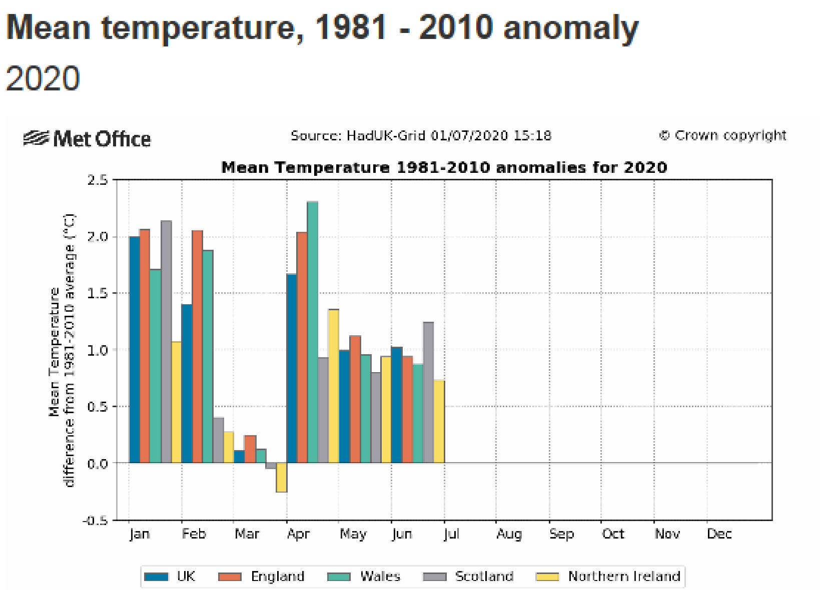


**Figure 1: Mean temperature by month and region, Q2 2020 compared with the 1981-2010 average (Met Office)**

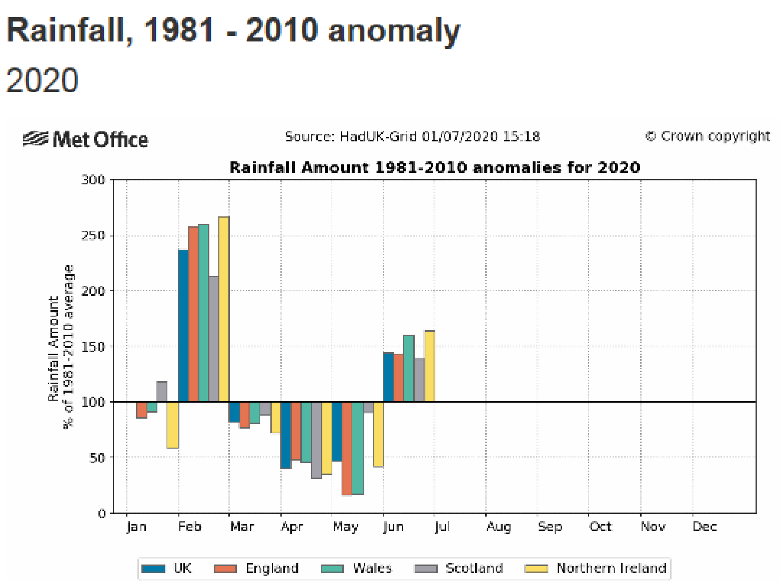


**Figure 2: Rainfall by month and region, Q2 2020 compared with the 1981-2010 average (Met Office)**

The very dry and hot weather through March to May probably accounted for problems encountered on dairy farms in west Wales and the south west of Scotland where 'pine' was encountered (this is discussed in detail on page 13).

As in 2018 when there was similarly a long period of hot dry weather this has the potential to affect endemic parasitic disease; the challenge of nematode parasites will have been reduced over the dry period, and this may mean a greater parasitic challenge to naïve animals later in the grazing season.  There is a statistically significant decrease in the diagnostic rate for parasitic gastroenteritis (PGE) in the second quarter of 2020 compared with the same quarter in 2019. A consequence of this reduced exposure of naïve animals to infective larvae early in the season, is that they may not have developed as much protective immunity, which increases the potential for significant disease later this year. The diagnostic rate for PGE will continue to be monitored.

Reports indicate that most farms have sufficient forage (Figure 3), and maize is considered to be average to good yield/quality.  There has been very little hay made to date as there has been unsettled weather, but there has been more haylage/baled silage made to compensate.

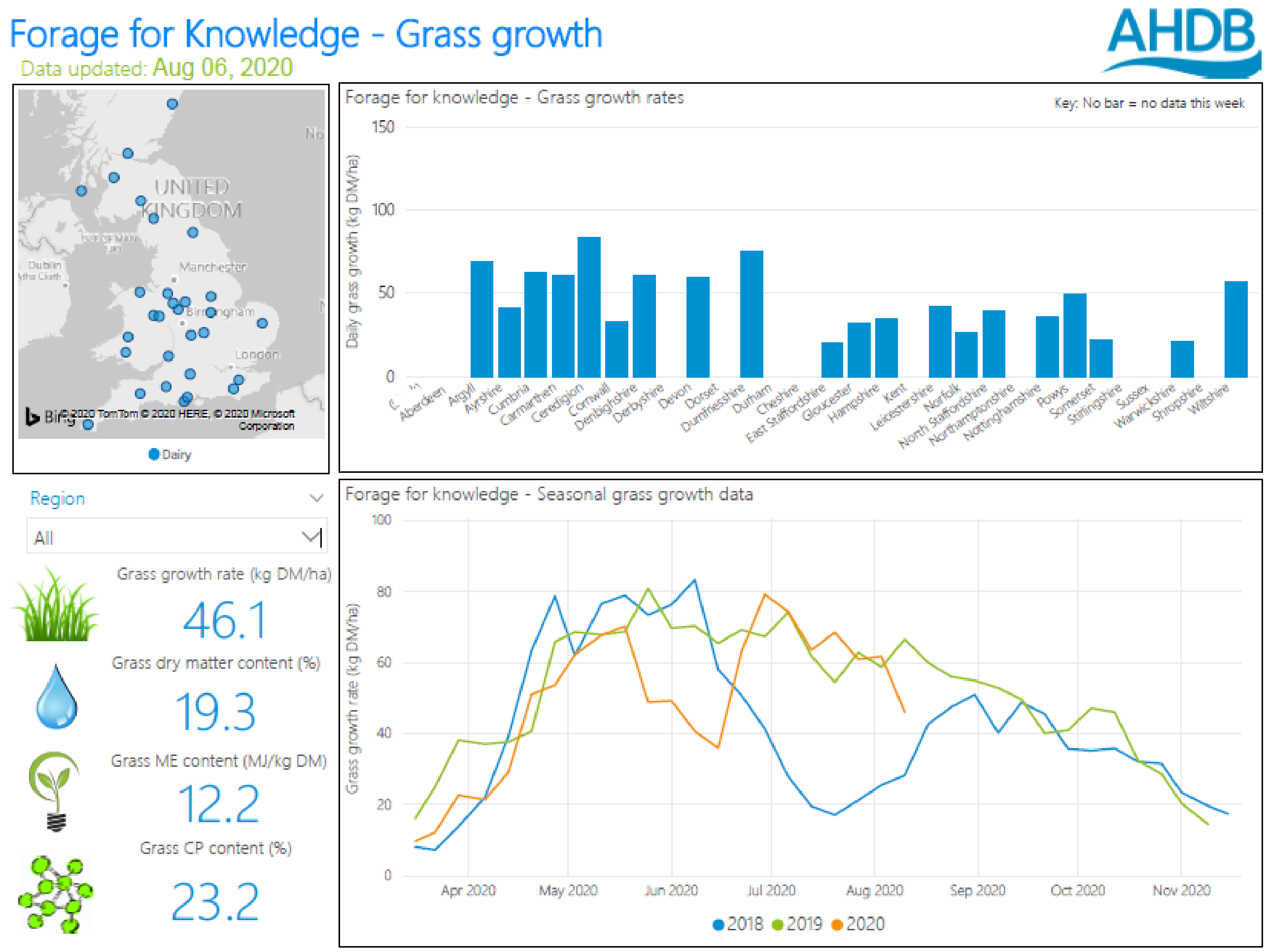


**Figure 3: Forage/grass growth reports for 2020 and comparison with 2018 and 2019 (source AHDB)**

## Dairy

The headline production and economic figures for the second quarter of 2020 were as follows: UK milk output was lower in 2020 during April, May and June, 42.76m litres down when compared to the first 6 months of 2019. The average farm-gate milk price during

May 2020 was 26.83ppl (down 1.01ppl on the average for May 2019). There is the usual variance in milk contract prices with many contracts either holding their prices or increasing very slightly. DEFRA has launched the much-awaited, UK wide consultation into milk purchasing contracts in the UK dairy industry which is due to close in mid-September. During the second quarter of the year the very dry weather resulted in poor grass growth and variable maize establishment and growth. The former has resulted in some excellent, dry first cut silages being made but regrowth of grass for subsequent cuts and that of grazing pastures was significantly limited. This has the potential to impact on both summer and winter feeding costs going forwards.

Although the initial milk price crashes for some farmers precipitated by the onset of the Covid19 lockdown might have eased slightly, there was still significant pressure on liquid milk supplies to the hospitality trade. Overall concerns remain about the security of milk prices going forwards.

Colin Mason, SRUC

### Beef

The relative stability of prices at the end of March ended about 1 week into April, with sharp reductions in prices due to low demand. Retail demand for mince (cheapest cuts), the closure of foodservice channels (normally home to some higher value cuts), and lower hide prices were all reported to have contributed to low prices.

The 'bounce-back' did come in May, however, which saw record-breaking price rises as demand accelerated, with fast-food outlets opening and good weather driving retail beef too. Prices quickly crossed the 5 year average line (about 343ppkg DW) and kept rising.

The dry weather also led to concern over grass shortages. There was increased culling from the dairy herd (driven by both COVID impacts on dairy markets and low grass growth), but the demand was sufficient to take this increased supply without reducing prices until after the end of the quarter. June also saw continued and rapid price rises as lockdown eased and good weather continued. Average prime prices finished the quarter just below 360ppKg, about 20ppKg above the same period last year, and 12.3p above the five-year average. The quarter ended with market analysts advising that Irish beef had the potential to negatively impact the UK price in the coming weeks, as they started increasing production again following COVID restrictions there.

Tim Geraghty, SRUC

## New and re-emerging diseases and threats

Please refer to the annexe on GOV.UK for more information on the data and analysis.

# Unusual diagnoses

## Primary neoplasia of the brain of a yearling

In Q1 2020 an unusual diagnosis of a primary brain neoplasm, presumptively identified as a glioblastoma, was reported in a yearling dairy heifer. It was the third animal in a group of 150 which developed nervous signs, which was initially suspected by the practitioner to be caused by listeriosis. The first two animals were not investigated, the third was euthanased and submitted after it failed to respond to antibiotics and the neoplasm was identified on gross examination of the brain and by histopathology.

Three months later, on the same farm, the 4 year old Friesian Bull started to head press, groan, swing its head and roll its eyes.  It was examined and euthanased on farm and the head submitted. This animal had sired the yearling which was previously diagnosed with the glioblastoma, and it was reported that a total of six heifers on the farm, which were all sired by this bull, had died or were euthanased with signs of nervous disease over the previous 15 months. Additionally, a heifer was recently sent to the slaughter house as it had a palpable uterine mass and was condemned as it had disseminated neoplasia throughout the carcase.

**Figure 4: View of the fixed brain of a 4-year-old bull showing abnormal mass in the right frontal lobe which was identified as a neoplasm of glial cell origin**

Gross examination of the brain identified an abnormally shaped area of the frontal lobe of the brain and histopathology confirmed it to be neoplastic (Figure 4). It was initially presumptively identified as a meningioma but was subsequently re-evaluated together with brain slides of the previously submitted heifer, and both were considered to be composed of cells of glial origin. Labelling of the brains of the two animals using ‘cell markers’ is being considered to investigate further. Neoplasia of the brain is very usual in all domestic animals, and in particular in bovines, and hence the likelihood of having two similar neoplasms in related animals from one herd is remote.

### Outbreak of concurrent tick borne fever (*Anaplasma phagocytophilum* infection) and redwater (*Babesia divergens* infection) in a dairy herd in the south west of England

An outbreak of concurrent tick borne fever and redwater was investigated in a dairy herd in the south west of England. This relatively new unit was set up four years ago through purchasing the entire herd over this time. Sporadic cases of animals passing red urine and having anaemia, indicative of babesiosis, were reported in the last few years, with several cows requiring treatment last summer. Recrudescence of 'latent babesiosis' was also suspected last summer in one animal which showed signs of 'redwater' 160 days after being housed. Following these cases, investigations were carried out into potential underlying immunosuppressive factors, including vitamin and mineral deficiencies, and other infectious diseases. None was identified and vaccination of animals with an imported recombinant babesiosis vaccine was implemented before turnout this spring.

At the beginning of April 2020, 25 cows presented with milk drop, blood in the milk, pyrexia and abortions a couple of weeks after turnout. Large numbers of ticks were noted on the animals and suspicion of tick borne fever was raised (Figures 5 & 6). Nine other animals in the group presented with 'classical' signs of babesiosis including anaemia and red urine. Ticks collected from animals were submitted to the Public Health England Tick Surveillance Scheme and were identified as the hard-tick *Ixodes ricinus*, the most common tick species in the UK. A pan-piroplasm PCR developed by APHA Weybridge was utilised on both blood samples and ticks collected from affected animals. Coinfection of *Babesia divergens* and *Anaplasma phagocytophilum* (the causative agent of tick borne fever) was identified in several cows, with numerous ticks confirmed PCR positive for *A. phagocytophilum*.

Although animals were on good quality grassland pasture and had received vaccination against babesiosis, tick numbers this year have been reported to be very high throughout the grazing season, likely leading to overwhelming challenge in a herd containing previously naïve animals. It has been suggested that piroplasm co-infections can cause an increased severity of clinical signs (Andersson and others 2017), which may also be a factor in this case, however the pathological, immunological and epidemiological aspects of co-infections are poorly understood. Despite the use of prophylactic antibiotics and imidocarb dipropionate, regular ectoparasiticide treatment, lime application to pasture and spraying fields with a synthetic pyrethroid, clinically-affected cattle cases have continued throughout summer, with approximately 45-50 animals affected in total. Investigations into this outbreak are continuing. This case has similarities with another which was reported in the Q2 cattle quarterly report in 2019 which occurred in a 30 cow suckler herd in Dorset https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/828432/pub-survrep-c0419.pdf. That outbreak was unusual as it happened in February, which is early in the year for such heavy tick challenge. Details of this outbreak were subsequently published earlier this year (Johnson and others 2020) https://parasitesandvectors.biomedcentral.com/articles/10.1186/s13071-020-04174-3.

**Figure 5: Photograph of ticks attached to the ventral skin of an affected dairy cow**

**Figure 6: The ticks which were removed from two of the affected cows show typical morphology of *Ixodes ricinus***

## Uncommon manifestations of *Histophilus somni* infection

*H. somni* is primarily renowned for outbreaks of pneumonia, though it is also identified causing septicaemia, thromboembolic meningoencephalitis (TEME), myocarditis, polyarthritis, otitis media, mastitis and reproductive disorders (Wessels and Wessels 2005, van der Burgt and others 2007).

Penrith Veterinary Investigation Centre investigated a disease outbreak in weaned dairy heifers which developed neurological disease. Three animals aged five to six months were affected in a group of 20 over a period of three to four weeks. Two of the calves were found recumbent, having previously not been ill, while the third calf was first noticed to be incoordinated. One of the recumbent calves also exhibited twitching, and after treatment with antibiotic and NSAID was able to stand but was unsteady and had a head tilt. It also had signs of respiratory disease.

Postmortem examinations identified no gross brain lesions in any of the calves, but there were many myocardial abscesses (Figure 7) present in the hearts of two, which also had adhesions to the pericardium, and there was variably extensive lung consolidation in all three animals. *H. somni* was isolated from the heart of one of two calves sampled for bacteriology; treatment with antibiotics was considered likely to have affected ability to culture the organisms from the second calf. Histopathology confirmed a necrotising and suppurative encephalitis in all calves, with vasculitis and thrombosis of the brain also a feature in one (Figure 8), a chronic active necrotising and suppurative myocarditis in two, and in each a fibrinosuppurative bronchopneumonia. Testing for BVD, louping ill and malignant catarrh ruled out these viral infections, while the histopathology was considered typical of infection by *H. somni*.

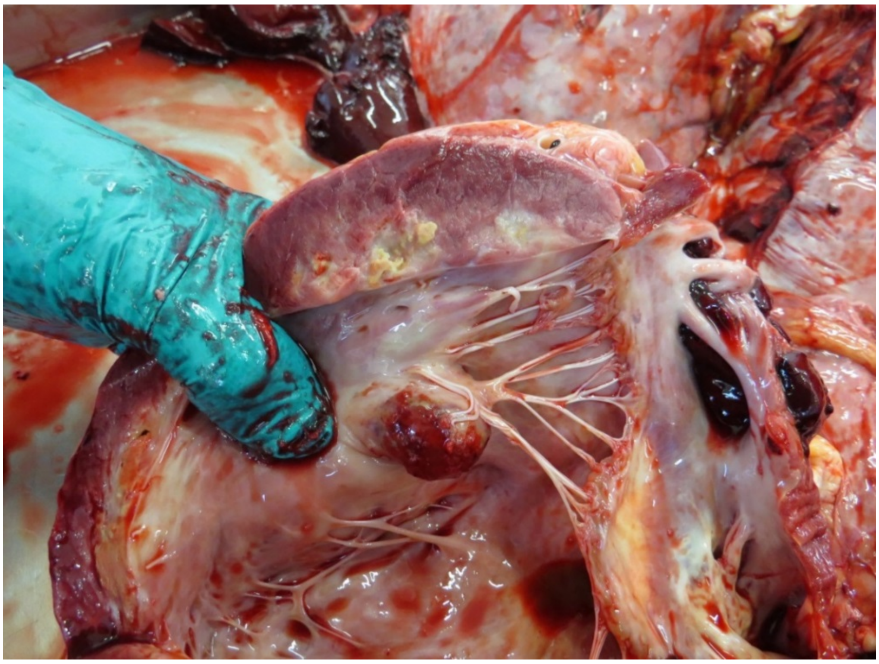

**Figure 7: Multiple myocardial abscesses in a calf with *Histophilus somni* infection**

*H. somni* infections are diagnosed in dairy and suckler herds, and on fattening and rearing premises, in England and Wales. Disease occurs from a few days of age through growing animals, and occasionally in adults. Veterinary Investigation Disease Analysis (VIDA) records over the last five years confirm that *H. somni* is more commonly identified in herds in Scotland and the north of England than elsewhere in England and Wales.

Prevention of infection by *H. somni* can be difficult, especially where cattle are purchased from mixed sources. Vaccination may assist disease control. As for all infectious causes of pneumonia, consideration must be given to all aspects of the management of the cattle, and a useful check-list to discuss with farmers is available at http://beefandlamb.ahdb.org.uk/wp-content/uploads/2018/07/Pneumonia-MOT.pdf.

**Figure 8: Gross pathology lesions of focal darkening at several sites of the brain suggestive of thromboembolic meningoencephalitis which was confirmed by histopathology**

## Epistaxis in dairy cows associated with mycotic and BVD infections

Three dairy cows presented with epistaxis in a housed group of 100. The first in November 2019 was a fifth lactation cow which was 100 days in milk, and after two to three episodes of epistaxis, died. The second case was a dry cow. Following non-specific treatment the nose bleed stopped but the cow remained unwell. The third cow was 100 days in milk and was diagnosed with *E.coli* mastitis two weeks prior to submission. Following administration of hypertonic drip the condition of the cow improved, although she never came back into milk. She started bleeding from the nose and was found dead in the evening of the same day. The cows were housed and fed good quality grass silage, a blend and concentrates. They are vaccinated against IBR. Recent tag testing had identified a few BVD PI animals in the herd.

Postmortem examination confirmed pallor, mastitis affecting one quarter, a pale mottled liver with some very pale foci measuring 1-2 cm, a moderate volume of clotted blood at the nares and within the nasal cavity and several areas of mucosal ulceration on the conchae on both sides of the nasal cavity, one of these areas having a diphtheritic membrane overlying the ulceration (Figure 9). There was also a large area of haemorrhage within the right caudal lung lobe.

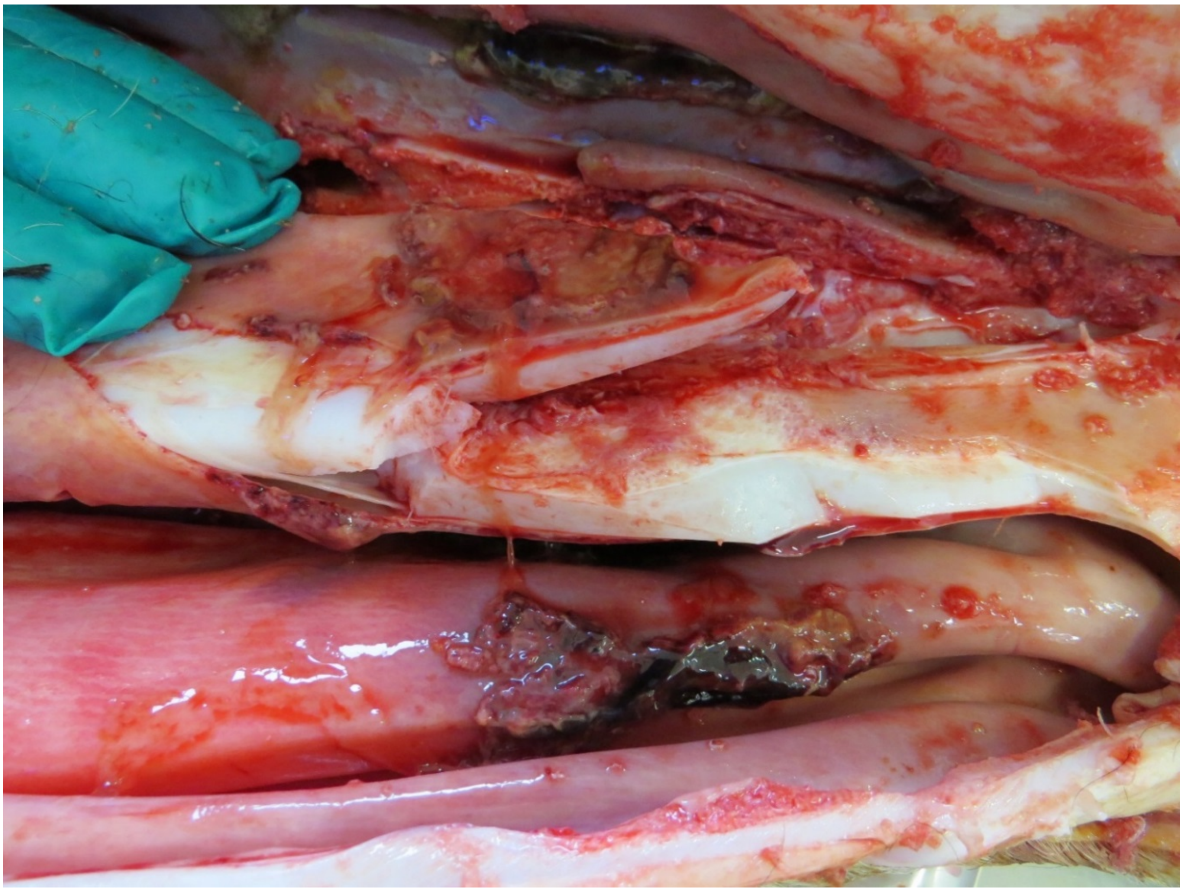

**Figure 9: Mucosal ulceration of the conchae of the nasal cavity, with a diphtheritic membrane overlying an area of ulceration**

No bacterial pathogens were identified but *Aspergillus fumigatus* was isolated from the nasal lesions. No ovine herpesvirus 2 DNA was detected and respiratory viral PCR testing was negative. BVDv-1 was detected in the spleen. Histological examination confirmed:

- severe, multifocal to coalescing, chronic active, suppurative rhinitis with intralesional fungi suggesting a primary mycotic lesion, in addition to granulation tissue and bacterial colonisation
- severe, multifocal to coalescing, chronic active, fibrinosuppurative and necrotising bronchopneumonia with intralesional bacteria and a tentative mixed sarcoma in one of the examined fields
- minimal, multifocal, chronic, lymphoplasmacytic and histiocytic perivasculitis

Immunohistochemistry for BVD indicated an acute rather than persistent infection; even so, this would likely have caused immunosuppression.

## *Coxiella burnetii* infection of a ‘fetal monster’

Three abortions occurred in a week in a dairy herd of 200 cows vaccinated against BVD and IBR. The first occurred at 3 months gestation, the second at 5 to 6 months gestation and the third, which was submitted for examination, at around 6 to 7 months gestation. The calf was received with its placenta which had irregular thickening and poorly-developed flattened pale necrotic cotyledons (Figure 10). The calf had almost no hair and was anasarcic (Figure 11). There was much fluid in the thorax and abdomen, with many cystic cavities present in the abdomen and within the skin, especially over the head and neck. The kidneys were very small and the liver was degenerate. A large ventricular septal defect was present and the heart was rounded in shape. A full length cleft palate was present. An MZN smear of the placental cotyledons identified many intracellular acid fast organisms and these were confirmed to be *Coxiella burnetii* (the cause of Q fever in humans) by PCR testing.

**Figure 10: Placenta of an aborted ‘monster’ calf showing poorly developed cotyledons: *Coxiella burnetii* infection was confirmed**

The conclusion was that the aborted calf had multiple congenital defects which were probably caused by a spontaneous genetic defect, although such problems could also be caused by hereditary origin or through exposure to teratogens. The identification of the *C. burnetii* was unexpected; infection by this bacterium is considered to be fairly widespread in cattle and in most cases causes no clinical signs. This case indicates the potential for any abortion to be infected by this organism, including ‘fetal monsters’ and that hygiene precautions, including handling aborted calves and placentae wearing gloves, should be practiced. Advice on the zoonotic aspects of *C. burnettii* which causes ‘Q fever in people is available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/487806/Q_fever_information_for_farmers_2015.pdf

**Figure 11: Grossly anasarcic aborted fetus**

## Idiopathic tetanus in dairy heifers

‘Idiopathic tetanus’ was diagnosed in four of a group of 52 contract-reared dairy heifers aged 14 to 15 months. They were part of a larger batch of 105, the 52 animals originated from one source, and had been on the premises since the end of January. The first case of suspected tetanus was an animal which was found bloated, with a stiff gait, ‘lock jaw’ and a raised tail head. It could not eat or drink and it didn’t respond to antibiotic and NSAIDs, and was euthanased. Three more similarly affected heifers were seen three to four weeks later; they were moved to housing and although they showed signs of wanting to eat and drink were unable to masticate or swallow. The following day one was euthanased and submitted for examination. The rumen was relatively empty and a single deep ulcer was present in the abomasum which had brown fluid content, with similar fluid also present in the intestine. The abomasal lesions were considered secondary; the lack of other diagnostic pathology and the description of typical clinical signs were considered diagnostic for tetanus. The group of heifers was moved from the field where they had been grazing and they were vaccinated against tetanus. The land they had been grazing consisted of 18 acres of permanent pasture with hedges and fences. The ground was banked with evidence of rabbit burrowing activity and had areas of bare soil. Outbreaks of ‘idiopathic tetanus’, where there is no obvious cause, such as accidental or surgical wounding, have previously been reported in groups of heifers at grass, affecting around 50% of groups of 16 and 17 animals (Wallis 1963, Whitehead and Ellicott 1996). The underlying ‘trigger’ for tetanus in the previous reported cases and in this recent outbreak is undetermined.

## Congenital hepatic fibrosis (CHF)

A third trimester fetus was presented from a third parity dairy cow and found to have several developmental defects including hepatic fibrosis. The fetus had marked abdominal distension due to ascites. The liver was grossly enlarged and had firm parenchyma with a ‘cobblestone appearance’ to the surface (Figure 12). The heart was enlarged with an almost globular shape and the spine was distorted. Routine screening for infectious agents was unremarkable and histology confirmed congenital hepatic fibrosis (CHF).

The connection to the spinal distortion was uncertain but CHF has been associated with skeletal deformities in the Romagnola breed (Testoni and others 2009).

**Figure 12: Diaphragmatic surface of the liver of a calf with congenital hepatic fibrosis showing a ‘cobblestone appearance’**

# Changes in disease patterns and risk factors

Please refer to the annexe on GOV.UK for more information on the data and analysis.

## Systemic disease

### Pica in grass-based dairy herds

During May and June, reports of pica (cows eating stones and other non-nutritive material) were received from grass-based, mainly spring-calving, dairy herds in west Wales and south west Scotland. Similar reports, in smaller numbers, were received in previous years in May and June.

The onset of cows exhibiting pica was in mid to late April. Between 50 and 100% of cows showed signs of pica in the affected herds. Commonly, the cows were seen eating stones from cow tracks, and as a consequence the cows were unwilling to move along tracks. In some herds, consumption of plastic buckets, cubicle mattresses and Astroturf cow tracks was also reported.

In some of these herds pica was the only abnormal sign, the cows apparently otherwise well. In other herds, farmers reported ruminal stasis, inappetance, decreased milk yield and butterfat, haemoglobinuria, anaemia and gastro-intestinal obstruction associated with a small number of deaths. Lead poisoning secondary to pica was diagnosed in one cow in a Scottish herd.

The possible causes of pica include deficiencies of phosphorus or sodium. A lack of dry matter and/or structural fibre, or energy or protein deficiencies may also cause, or contribute to, pica. Pica has also been reported in animals with nervous ketosis and also exhibited as a learned behaviour in cows. The evidence in the literature for these causes is mostly anecdotal.

The results of forage analysis on affected farms indicated higher than average dry matter content. By May, the pasture grass was observed to be entering the reproductive phase with stem and seed heads giving higher structural fibre content, making a lack of dry matter or structural fibre unlikely to be major factors.

The proximity to the coast, in addition to the routine provision of rock salt on the affected farms, made salt/sodium deficiency unlikely on most of the farms.

The haemoglobinuria and anaemia reported in some herds was suggestive of hypophosphataemia, and this was confirmed biochemically on blood samples from cows in some of the affected herds. Cattle in herds managed in 'low-input systems' i.e. reduced supplementation of concentrates, may be at risk of a marginal or low phosphorus status, with the absorption of phosphorus from grass and concentrates inadequate to balance the amount lost in milk. Availability of soil phosphates and their uptake by grass are thought to have been negatively impacted by the very dry spring.

Dry conditions also affected the grass growth rate, which was reduced to around a third of normal for the time of year, and as a consequence many herds experienced grazed grass shortages. Natural water supplies were also low in many areas, which may also have impacted milk yields.

Management of the affected herds to try to overcome the problem has involved attempts at various means of phosphorus supplementation including licks, addition to water, and an increased inclusion in parlour concentrate, in addition to increased concentrate or buffer feeding, and preventing access to stones. The response was variable. Cessation of pica was reported in several herds in the last week of June, attributed to the various interventions, and occurring a few days after the first significant rainfall for several weeks.

A case-control study is planned to investigate herd level risk factors for this condition. We would be interested to hear from colleagues who have received reports of pica this grazing season at carmarthen@apha.gov.uk.

# Enteric system

## Severe Summer Scour Syndrome (SSSS)

An in-calf 19-month-old dairy heifer was euthanased and submitted to investigate the cause of malaise and dysentery in a group of heifers at pasture. The animals had been at pasture for less than two weeks and the onset of clinical signs was reported to be a few days after turnout. Four animals had been affected and died at the time of submission, with two others displaying similar clinical signs. A postmortem examination was performed on farm by the practitioner on the first animal to die. Hepatitis and enteritis were reported.

The animals had received a copper bolus four weeks prior to submission. *Salmonella dublin* infection and *Clostridium sordellii* abomasitis were diagnosed in other animals in the herd with similar clinical signs in the past. The herd is vaccinated against BVD (and tag testing is performed on young stock), IBR, lungworm and clostridial diseases (Bravoxin).

Postmortem examination revealed hepatomegaly and an increased quantity of pale-yellow fluid within the abdominal cavity. There were erosions measuring 1.2 to 2.0 cm on either side of the tongue, the surface of the epiglottis was necrotic and the entire length of the oesophagus was ulcerated with a necrotic exudate on the mucosal surface (Figure 13). Two areas of acute mucosal ulceration were present in the abomasum near the junction with the omasum and adjacent to the pylorus. Little rumen content was present with watery small intestinal content.

**Figure 13: Oesophageal ulceration in a 19-month-old dairy heifer**

No significant patent nematode burden was present and no significant bacterial infection was detected; a yeast species was isolated from the oeophagus. BVD and MCF PCR testing was negative.

Histological examination confirmed:

- hepatic lipidosis consistent with negative energy status
- moderate acute to subacute tubulonephritis
- multifocal, acute, ulcerative, fibrinosuppurative, epiglottitis and oesophagitis
- mild, focal, acute, ulcerative, fibrinosuppurative abomasitis
- lymphoid depletion of the Peyer’s patches

The underlying cause of the ulcerative lesions could not be determined. The histopathological findings suggested a possible toxic effect on renal tubular epithelium and liver, however the lesions were non-specific. Causes of immunosuppression facilitating the colonisation and proliferation of opportunistic bacteria or fungi on the mucosal surface could explain the mucosal lesions.

Although these were 19-month-old heifers, it was their first grazing season. The ulcerative lesions within the GIT and the onset of clinical disease less than two weeks after first grazing are suggestive of severe summer scour syndrome.

The Cattle Expert Group are continuing the project through the 2020 grazing season and are keen to hear from colleagues in practice who suspect the condition. Please discuss in the first instance with your local surveillance provider.

## Idiopathic necrotising enteritis of suckler calves (INESC)

In June Penrith VIC investigated an outbreak of Idiopathic Necrotising Enteritis of Suckler Calves (INESC). Five calves aged three to four months died (including two that were euthanased) in the herd of 50 suckler cows. The affected calves presented with diarrhoea and pyrexia, with no response to antimicrobial and anti-inflammatory treatments, or were found dead. The herd is extensively grazed with water accessible from a river and pond. The cows are vaccinated against BVD virus, *Salmonellae*, and leptospirosis; and there is annual herd screening for BVD virus. Initially visceral samples were received from two calves examined by the practitioner and laboratory examinations raised suspicions of INESC. Following this two affected calves were blood sampled and euthanased, and submitted for postmortem examinations. The first calf had melaena. Haematology confirmed that it was anaemic and marginally leukopenic (not neutropenic), whereas the second calf was only mildly anaemic but markedly neutropenic. There were multifocal transmural necrotising lesions within the alimentary tract (Figures 14 & 15), including severe lesions within the forestomachs and small intestine. In the first calf there was also an associated peritonitis, in addition to markedly enlarged pale kidneys, whereas in the second calf there were less marked intestinal lesions and tongue ulceration.

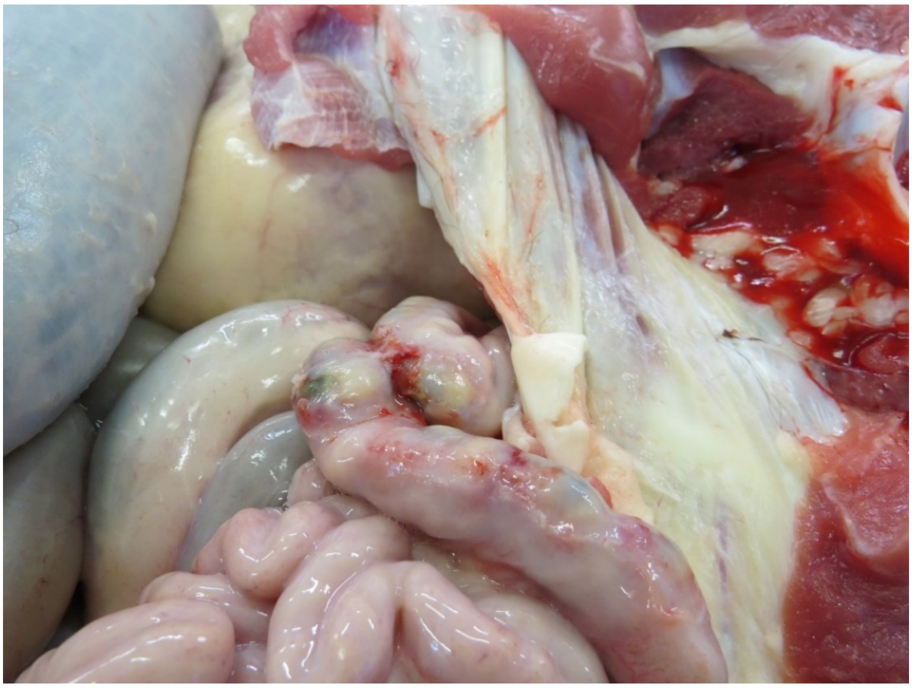

**Figure 14: Serosal lesions including adhesions of adjacent loops of intestine in a calf with INESC**

A range of opportunistic bacteria and fungi was detected in the alimentary tract lesions. Potential immunosuppressive pathogens including BVD virus and *Anaplasma phagocytophilum* were not identified by PCR tests in either calf. Coronavirus was detected in the faeces of the first calf. Histopathological examination of both calves identified severe necrotising ulcerative lesions with bacterial and fungal involvement and a paucity of neutrophils in the inflammatory infiltrates, in addition to lymphoid depletion of Peyer's patches, which is consistent with INESC. The first calf also had a severe necrotising interstitial nephritis. There was no pathology attributable to coronavirus.

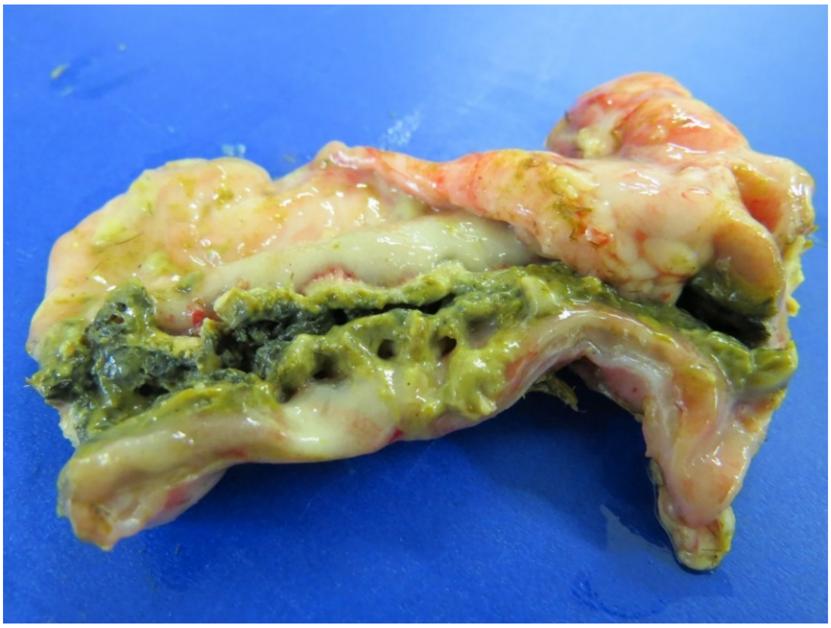

**Figure 15: Mucosal intestinal lesions of a calf with INESC showing coalescing necrosis**

INESC was first recognised in the 1990s, and although a considerable amount of investigation has been undertaken the definitive cause is unknown. The pathology in affected calves suggests an underlying immunosuppressive disorder, possibly of multifactorial aetiology, and there is a spectrum of clinical and pathological severity. It is during the mid-summer months when most disease is identified (Figure 16), which reflects the age prevalence in unweaned calves, cases occurring particularly between 2 and 4 months of age. A review of previous submissions and earlier investigation/research findings is ongoing.

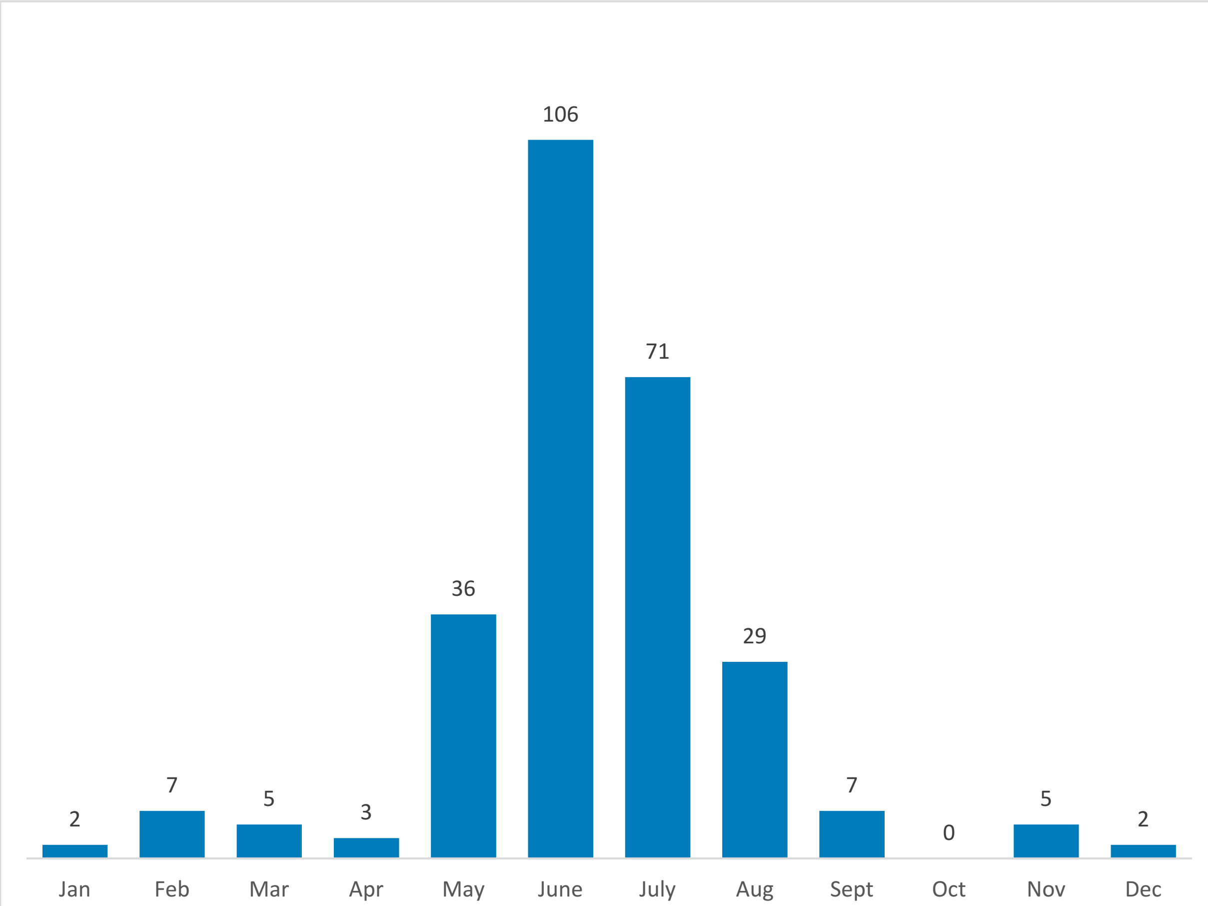


**Figure 16: Seasonality of Idiopathic Necrotising Enteritis of Suckler Calves (INESC) in England, Scotland and Wales 2002-2020**

# Alimentary system diseases

## Parasitic gastroenteritis (PGE)

There is a statistically significant decrease in diagnostic rate for parasitic gastroenteritis (PGE) in Q2 of 2020 for GB and APHA data compared with Q2 of 2019 (Figure 17). This is likely to be due to the hot, dry spring weather reducing survival of infective larvae on the pasture. The wetter weather which occurred from June is expected to lead to an increase in larval challenge in Q3. Furthermore, as there was reduced exposure to infective larvae early in the grazing season, those animals in their first season grazing may not have developed as much protective immunity as might be expected, compared with milder wetter years, and the effect of the parasite challenge will potentially be more severe. The diagnostic rate for PGE will continue to be monitored.

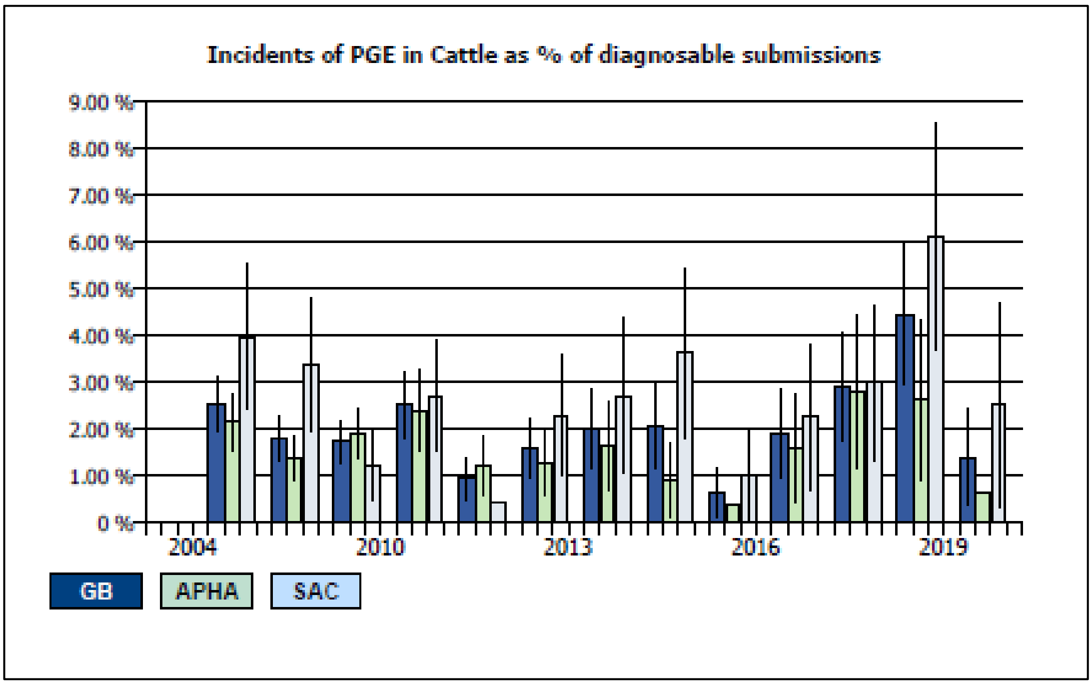


**Figure 17: Parasitic gastroenteritis diagnoses during the second quarter of years 2004-2020**

## Calves

No significant disease trends were identified in Q2 2020.

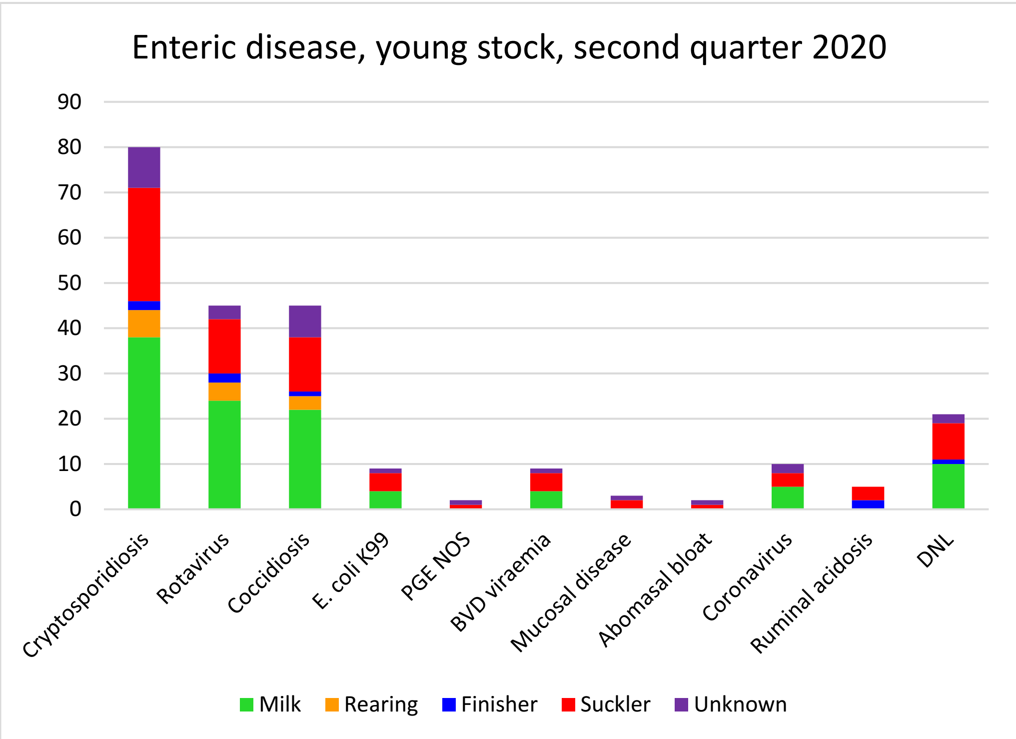


**Chart 1: Enteric diagnoses for young stock during the second quarter 2020**

# Interesting cases

## Abomasal ulceration in a neonatal dairy calf with milk powder a potential ‘trigger’

A new batch of milk powder was started however all but one of around 20 neonatal dairy calves refused to drink more than a small amount of the reconstituted milk. A few days later the calf which had drunk the full amount offered was found recumbent and fitting; it was euthanased and submitted for postmortem examination. The suspect batch of milk powder was replaced by the manufacturer, with all other calves reported to be drinking normally. Postmortem examination revealed a moderate quantity of brown fluid and milk clots in the abomasum which had marked generalised inflammation and a deep ulcer measuring approximately 2cm, with smaller adjacent ulcers, in the greater curvature. Other viscera were congested and a ZST indicated insufficient systemic colostrum intake. The severe ulcerative abomasitis was considered to have caused the calf to become recumbent, necessitating euthanasia.

We have identified abomasal disease, including ulceration, with increased prevalence over recent years. It is difficult to know what is the cause in many of these cases; a review of feeding practices, hygiene and management aspects is recommended when such cases are identified. In this case, given the history of the group of calves refusing or reluctant to drink the reconstituted milk, the milk powder was considered the potential ‘trigger’ to the ulcerative abomasitis. An alert was circulated to other APHA, SRUC and partner surveillance providers, however, we received no other reports of similar problems with milk powder in other herds.

## *Toxocara vitulorum* infection in a suckler calf

A five-week-old South Devon suckler calf was presented for examination after being unexpectedly found dead. Intestinal volvulus was diagnosed on postmortem examination. Two other calves in the group of 230 cows with their calves had died; the practitioner commented that *Toxocara vitulorum* infection was identified in the first of these calves (it had previously been identified in this herd but monitoring/treatment had ceased). Infection by the nematode parasite *T. vitulorum* was not recognised in cattle in the UK until it was identified in a UK suckler herd in 2007 (Jones and others 2009), and since has rarely been detected. Infection in calves is lactogenic, acquired from the dams in colostrum or milk and the parasites can cause significant clinical disease including diarrhoea, poor thrift and potentially intestinal obstruction. Once the parasite is established in a herd, specific control measures are required to prevent disease occurring in the calves; treatment of calves between 10 and 16 days of age has been recommended (Roberts 1992).

## *Clostridium perfringens* type D infection in calves including one born prematurely and another affected shortly after disbudding

*Clostridium perfringens* type D infection was diagnosed in two bovine submissions to Penrith VIC from different farms in May. The first submission was a premature calf from a suckler herd which was experiencing problems with abortions and stillbirths; late third trimester calves were born dead, or born alive but weak with death occurring within a few hours. At least eight calves had been affected in the group of 100 cows which are vaccinated against BVD. The affected calf was born alive and survived for a few hours. There were no significant gross postmortem findings. It had a few milk clots in the abomasum, but little intestinal content. No infectious organisms were identified, however, histopathological examination found vascular changes in the brain which were characteristic of focal symmetrical encephalomalacia due to injury by *C. perfringens* epsilon toxin. As there was scant intestinal content toxin testing was not performed.

*C. perfringens* enterotoxaemia has been identified in a wide range of calves and also adult animals; a report on the disease occurring in one-day-old calves was previously published by APHA (Watson and Scholes 2009). The diagnosis did not explain the previous abortions in the herd, and the submission of further calves and placentae was recommended if the problems continued.

The second submission was a two-week-old Holstein dairy calf that developed neurological signs within a few hours of being disbudded with a hot iron, shortly followed by death. Twenty calves, all reported to be healthy, were disbudded, the 19 others making an uneventful recovery. On postmortem examination the calf was found to have been diarrhoeic and had scant intestinal contents. Cryptosporidia were detected in the faeces. There was no significant gross pathology to explain the neurological signs. Histopathological examination confirmed lesions typical of *Clostridium perfringens* type D enterotoxaemia in the brain; there was no indication that the neurological signs and death were due to the disbudding procedure.

*Clostridium perfringens* type D disease usually occurs sporadically in cattle. Affected animals are often found dead, although terminally, neurological signs may be observed. Examination of the intestinal contents for clostridial toxins alone is not considered diagnostic as epsilon toxin can be found in clinically unaffected animals. Furthermore, absence of toxin does not rule out disease. Histopathological examination of brain is required for confirmation.

**Respiratory system**

There have not been any statistically significant changes in trends over Q2 of 2020 compared to the same quarter of previous years.

A rising trend has been noted for the percentage of diagnosable submissions where ***Histophilus somni*** pneumonia was found in Q2 in England and Wales (Figure 18). The level is similar to Q2 of 2011, albeit slightly elevated. The biggest increase in diagnoses was seen in pre-weaned calves in the North of England.

Diagnoses of ***Pasteurella multocida*** infection have continued an upward trend in Scotland over Q2 (Figure 19), being at an all-time high again, although there is not such a significant increase, compared with Q2 2019. The increase has been mostly recorded in dairy herds.

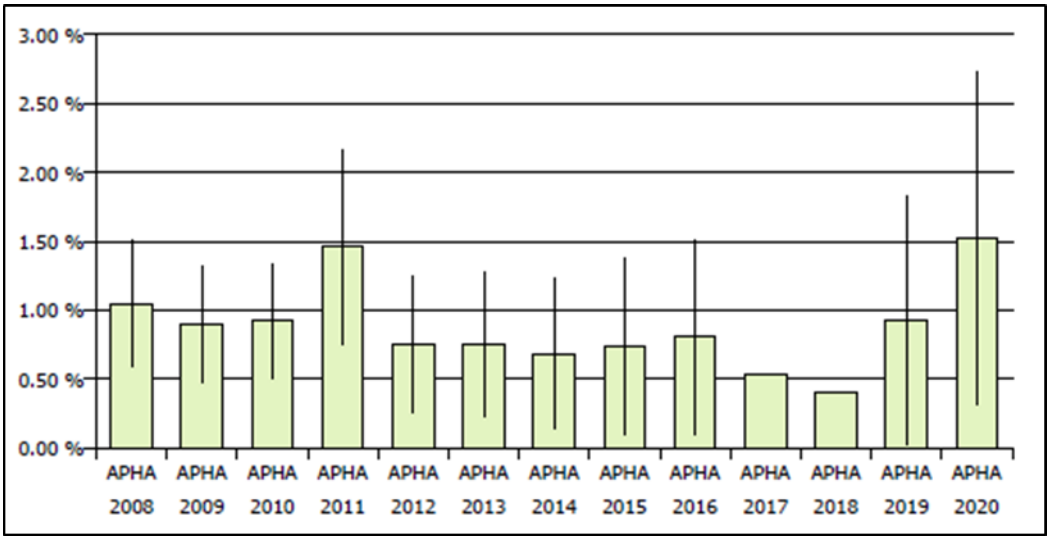


**Figure 18: APHA incidents of *H. somni* in cattle as % of diagnosable submissions in Quarter 2**

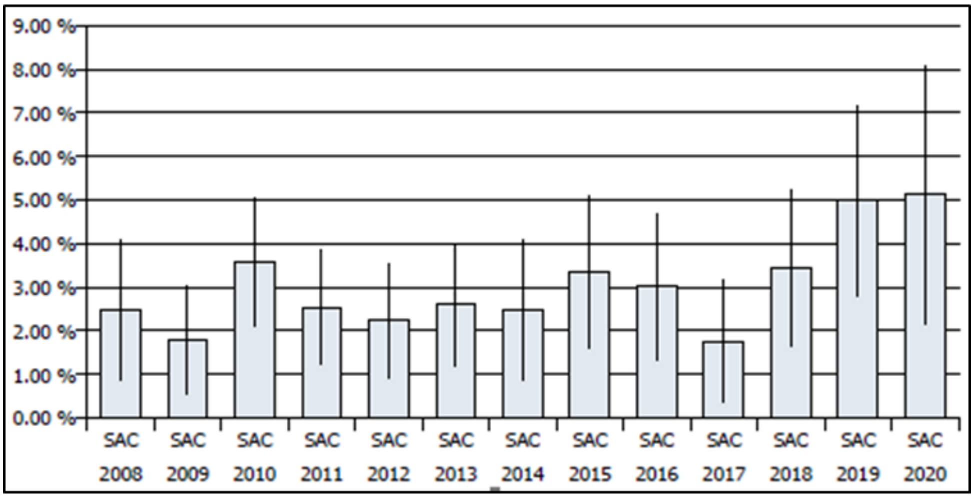


**Figure 19: SRUC incidents of *P. multocida* in cattle as % of diagnosable submissions in Quarter 2**

The upward curve described by the percentage of diagnoses in both pathogens is not mirrored by the overall GB figures and the Cattle Expert Group will continue to monitor these trends.

# Horizon scanning

## Bluetongue (BTV) update

In **North Macedonia**, fourteen outbreaks of BTV-4 have been reported since the beginning of July. These are the first outbreaks to be reported in North Macedonia since October 2014, when the country experienced a large number of BTV-4 cases affecting over 83,000 cattle, sheep and goats. The disease then, was epidemiologically linked to outbreaks in neighbouring Bulgaria and Greece. Only sheep and goats have been reported to be affected in the current outbreak. The Faculty of Veterinary Medicine for the

National Laboratory, in Skopje, is sequencing this current strain to compare it to the virus strain that was circulating in 2014 (OIE, 2020).

Elsewhere in Europe, in southern **Italy**, sixteen outbreaks of BTV-4 have been reported in 2020. In addition, there were two outbreaks of BTV-1 in Sardinia and Sicily in February and June. The whole of Italy is now a restricted zone for both serotypes 1 and 4. Following active surveillance in April, **Greece** reported an outbreak of BTV-4 in a sheep flock on Samos, an island close to the coast of Turkey. Greece is a restricted zone for BTV-4 only. Greece has also reported three outbreaks of BTV-16 in sheep and cattle on the island of Lesvos, and one on Samos between January and April. In February, **Spain** reported BTV-4 in a captive Black wildebeest (*Connochaetes gnou*) in Malaga, which is a region of Spain within the restriction zone for BTV-4.

One outbreak of BTV-8 in cattle was reported in **France** at the end of January; there were five outbreaks in **Belgium** between January and March, and two in **Switzerland** in January and March. A map of the BTV situation is shown in Figure 20.

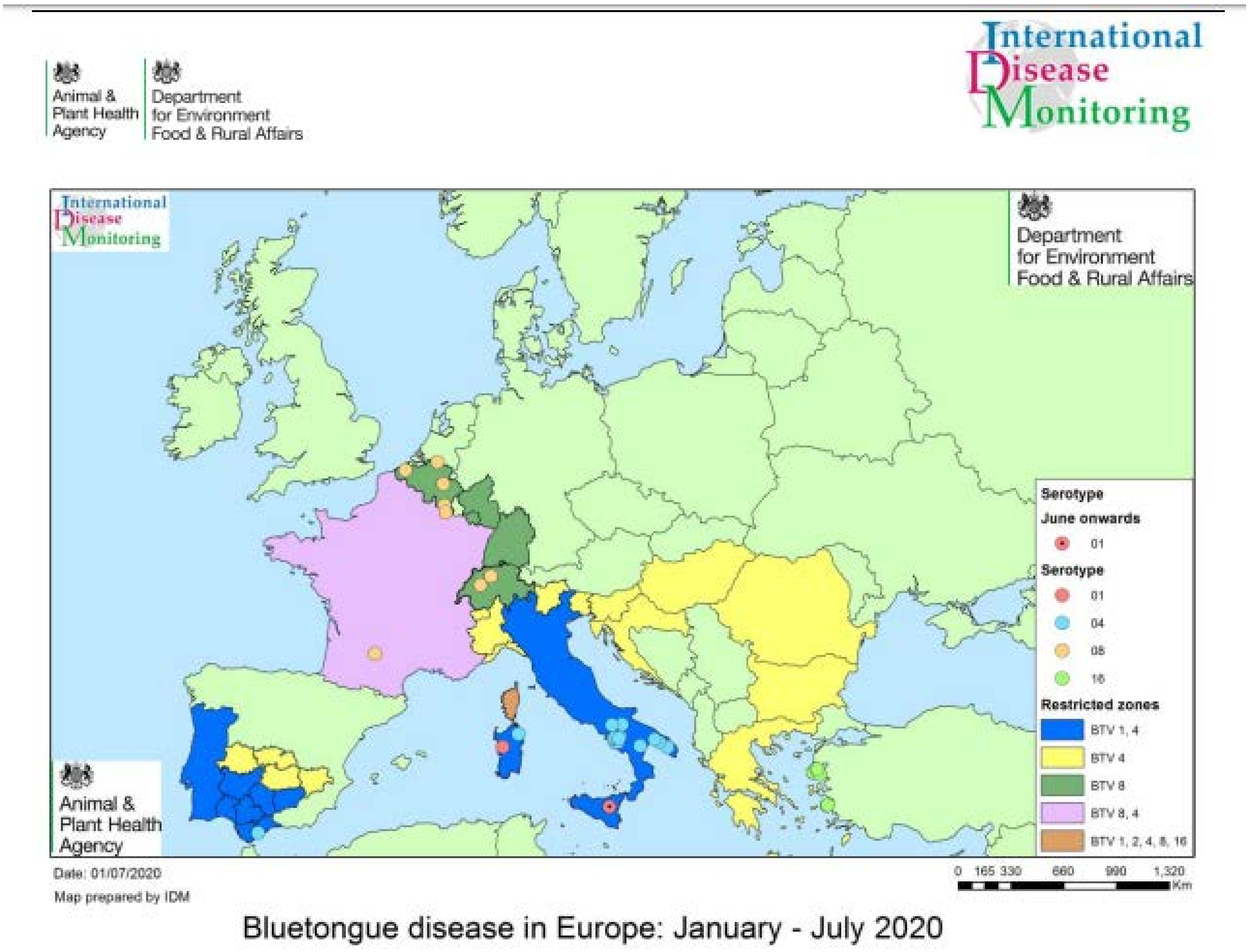


**Figure 20: Bluetongue disease in Europe January to July 2020**

The potential risk pathways for BTV-4 from southern Europe to the UK are through importation of infected livestock, rather than windborne incursion of infected midges. It remains to be seen how BTV-4 in southern Italy and Macedonia will spread over the summer months through the vector season. There have been no recent imports from the affected areas of North Macedonia recorded on TRACES; however, albeit small, some risk always remains from illegal imports of animals or germplasm.

The risk of introduction of BTV-4 or BTV-8 to the UK continues to be considered **LOW.**

Livestock owners and veterinary practitioners in the UK should note that an incursion of BTV-8 could result in trans-placental transmission and infection of fetuses in cattle and sheep. Bluetongue should therefore be considered as a possible differential when investigating poor fertility and offspring born with congenital brain malformations.

Livestock owners are strongly advised to source replacement stock responsibly and consult with their private veterinary practitioners to put in place controls preventing the introduction of Bluetongue. Assurances should be sought from traders that BTV-susceptible animals are fully protected prior to travel. This means that additional guarantees should be obtained certifying that the purchased animals have been correctly vaccinated and/or have built up sufficient immunity to protect them against the relevant BTV serotypes which are circulating in their region of origin.

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

# Chemical food safety

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

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/883481/pub-chemfood0120.pdf

# References


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