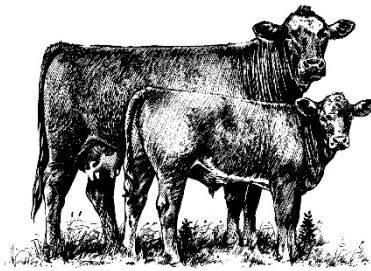




Animal &  
Plant Health  
Agency



## GB cattle quarterly report

### Disease surveillance and emerging threats

---

Volume 26: Q3 – July-September 2020

---

#### Highlights

- Husk and parasitic gastroenteritis in suckler cows – page 5
- ‘Tyre wire’ and abomasal disease - page 6
- Chiari-type II malformation and spina bifida in a calf - page 9
- Bluetongue update – page 15

#### Contents

Introduction and overview .....	1
Issues and trends .....	1
New and re-emerging diseases and threats .....	3
Unusual diagnoses .....	4
Changes in disease patterns and risk factors .....	12
Horizon scanning .....	15
References .....	17

Editor: Gareth Hateley, APHA Lasswade  
Phone: + 44 (0) 208 5654357  
Email: [gareth.hateley@apha.gov.uk](mailto:gareth.hateley@apha.gov.uk)

# Introduction and overview

This quarterly report reviews disease trends and disease threats for the third quarter of 2020, July-September. 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

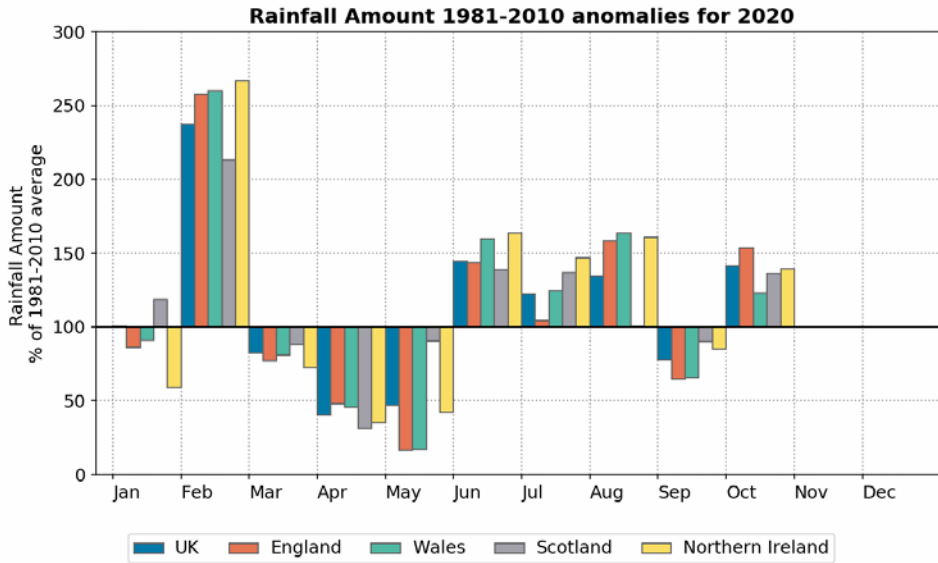
### Covid19

APHA, SRUC and partner postmortem providers took all reasonable preventative measures in view of the ongoing Covid19 situation and developed contingency plans in place to manage services across the network during the outbreak. They have continued to provide a diagnostic service for livestock through carcasses submitted for postmortem examination and from samples submitted by post for diagnostic testing and, for APHA sites, vets were reminded to contact their local site as directed by the postcode finder:

<http://apha.defra.gov.uk/postcode/pme.asp>

### Weather

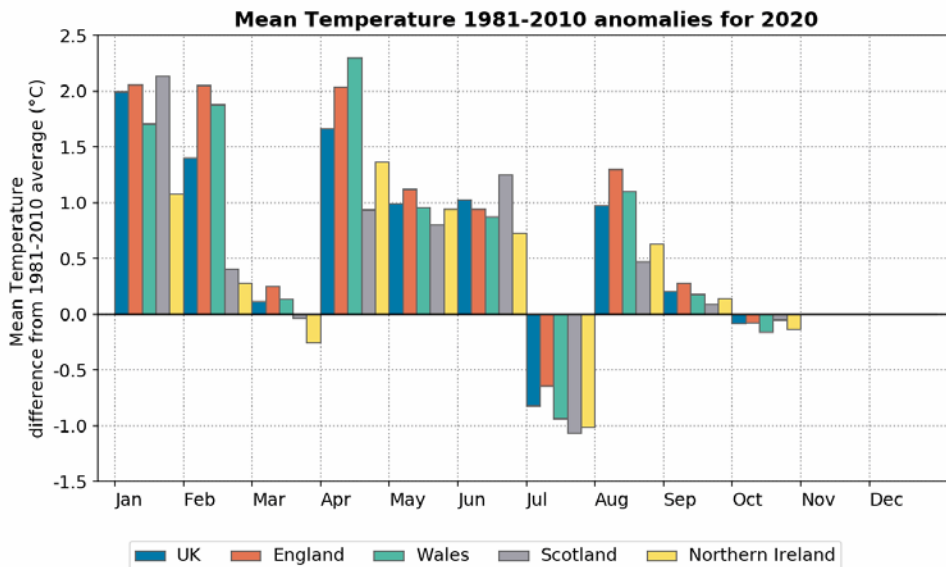
Rainfall in July and August was generally around 150% of the 1981-2010 average (Figure 1), and the mean temperature in July was 0.8°C below the 1981-2010 average (Figure 2). This was accompanied by lower levels of sunshine in July-August, and led to slower crop growth in several areas. This in turn led later in the season to reduced yields, particularly of forage and straw for bedding. This led to advice being issued to farmers (see <http://apha.defra.gov.uk/documents/surveillance/diseases/bedding-shortage-info-jan18.pdf>) and the NFU opened its forage bank. This was mitigated to some degree by a warmer drier September but some areas have experienced bedding shortages.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
UK	100	237	82	40	47	144	122	135	77	142		
England	86	258	77	48	17	143	104	158	65	154		
Wales	91	260	81	46	17	160	124	163	65	123		
Scotland	119	213	88	31	90	139	137	100	90	136		
Northern Ireland	59	267	72	35	42	163	147	161	85	139		

Figure 1 Rainfall by month and region, Q3 2020 compared with the 1981-2010 average (Met Office)

Mean temperature by month and region, Q3 2020 compared with the 1981-2010 average (Met Office)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
UK	2.0	1.4	0.1	1.7	1.0	1.0	-0.8	1.0	0.2	-0.1		
England	2.1	2.1	0.2	2.0	1.1	0.9	-0.6	1.3	0.3	-0.1		
Wales	1.7	1.9	0.1	2.3	1.0	0.9	-0.9	1.1	0.2	-0.2		
Scotland	2.1	0.4	-0.0	0.9	0.8	1.2	-1.1	0.5	0.1	-0.1		
Northern Ireland	1.1	0.3	-0.3	1.4	0.9	0.7	-1.0	0.6	0.1	-0.1		

Figure 2 Mean temperature by month and region, Q3 2020 compared with the 1981-2010 average (Met Office)

Such climatic factors, especially the increasing mean temperature, have the potential to influence endemic disease impact, for example, by influencing the survival rate of endoparasite larvae overwintering on pasture.

## **Dairy**

Cumulative UK milk production for 2020/21 now stands at 7,616.12m litres. This is 35.54m litres lower than at the end of September 2019. In spite of many milk contracts offering a slight increase in prices recovering from the falls during the start of the Covid pandemic, the UK average milk price for September 2020 is estimated at 28.72pence per litre (ppl). This is 0.49ppl lower than the average price received during September 2019.

Forage production including the maize harvest has been completed with good quality forage available for cows through the winter. For grazing cattle, grass supply has been reducing quickly through the late summer period with some grazing herds housing earlier than normal.

## **Beef**

Generally, UK beef prices in Q3 have been very good. Prime cattle prices started the quarter 10 pence per Kg deadweight (ppKg DW) above 5 year average, and rose sharply again through August, peaking at a five-year high of over 370ppKgDW in late August. Domestic demand was high, with average year-on-year increase of 15% in August and 10% in September, across all product types. Both imports and exports were reduced against year-on-year comparisons (though 2019 had unusually high exports). Prices did drop during September, though ended the quarter well above the five-year average (~15ppKg average for prime cattle).

Straw prices were reported to be increasing over the quarter, with low yields in some areas (price varies significantly in different regions) and there are some concerns about the quality and quantity of the straw supply for the coming winter with some reports advising exploring alternative bedding where available. These might impact bedding choice for youngstock, and could have hygiene and diet composition implications for dry cows.

Total UK cattle numbers were reported to continue to decline in July BCMS reports, with cattle under 24 months down 1%, and breeding aged female cattle (dairy and beef) down 3%.

## **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

## ***Mycobacterium avium* subspecies *paratuberculosis* infection in yearling beef cattle**

Two fattening yearlings were euthanased and presented for postmortem examination with a history of diarrhoea and wasting. Loss of condition in around 1% of the yearlings had been recognised as a problem over several years on the farm. In one animal, mild thickening of the ileum was identified and, in both, the mesenteric lymph nodes were enlarged. *Mycobacterium avium* subsp. *paratuberculosis* (Map) was detected by PCR in the faeces of both animals. Characteristic histopathological lesions of Johne's disease were not detected; however, these lesions are not always evenly distributed within the intestine, especially in early cases. Mild gastric and enteric pathology, consistent with nematode parasitism, was identified although it was not considered likely to be clinically significant. The identification of Map in such young cattle is unusual and is a reminder of the potential for Johne's Disease to occur in immature cattle. Targeted testing of the herd and establishing a Johne's action plan for the herd was recommended.

## **Selenium over-supplementation of young calves**

At least seven Limousin-cross calves died at about one month of age over a period of 10 weeks in a 250-cow dairy herd. Affected calves were reported to become weak, especially on their hind legs, and some were diarrhoeic. They progressed to recumbency, adopting a position with their hind legs splayed behind, and subsequently died. There was also hair loss on pressure points and on their heads. They were fed two litres of whole milk twice a day, sometimes supplemented with reconstituted milk replacer if sufficient fresh milk was not available, and an adult dairy cow concentrate from two weeks of age. They were also injected with a combined selenium, copper and zinc oxide preparation every 10 days. One calf was presented for examination having received three such injections by the time it died. The calf was in poor condition with hair loss and scaling of the skin around the base of the pinnae and over the dorsal aspect of the thorax. White and dark grey plaques were present on the rumen mucosa in addition to large numbers of small erosions.

Histopathology identified a moderate multifocal subacute suppurative rumenitis, mild multifocal subacute suppurative dermatitis, mild multifocal chronic active tubulointerstitial nephritis and evidence of leucocytosis. The liver selenium concentration was 25.6 mg/kg DM (reference interval 0.9-1.75 mg/kg DM). Although a higher selenium concentration is normally found in neonatal calves compared with adult cows, the biochemical results were indicative of over-supplementation of selenium. The clinical signs and pathology affecting the rumen and skin may have been due to subacute or chronic selenium toxicity. It was advised that the selenium supplementation should be reduced and that the calves should be fed consistently, either with fresh milk or milk replacer, in addition to a concentrate ration formulated for dairy calves.

## Dictyocaulosis and parasitic gastroenteritis in suckler herds

From the end of June, dictyocaulosis ('husk') and parasitic gastroenteritis (PGE) were diagnosed in APHA Veterinary Investigation Centres (VIC) in England and Wales. Although more commonly identified in dairy and rearing herds, two incidents in suckler herds indicate the potential for these parasitic diseases in all types of cattle.

An outbreak of husk in one suckler herd caused the death of three cows. The third cow to die was submitted for postmortem examination. The cow was reported to have shown marked respiratory distress for two days which did not improve with antibiotic, NSAID and steroid treatments. The lungs were over-inflated with widespread interlobular emphysema, and there were many air bullae in the caudal lobes. Small numbers of adult lungworm were identified within the smaller bronchi, and histopathology confirmed a severe chronic and active suppurative and lymphoplasmacytic bronchointerstitial pneumonia with many intra-lesional lungworm larvae, indicating that pathology was associated with prepatent as well as patent lungworm infection and confirming a diagnosis of husk.

PGE was diagnosed in a recently-calved two-year-old suckler heifer. She was one of a group of 20 reported to be losing weight, some with diarrhoea. The group had only been at grass for two months and had been treated with a macrocyclic lactone anthelmintic when housed in the autumn. Postmortem examination of the heifer identified a diffusely thickened and inflamed abomasal mucosa, intestines dilated with liquid contents, and enlarged mesenteric and gastric lymph nodes. Although there were only 40 trichostrongyle-type worm eggs per gram within the liquid large intestinal contents, estimation of the total worm burden in the abomasum confirmed a very high burden of 264,000 *Ostertagia ostertagi*, 300,000 *Trichostrongylus axei* and 652,000 immature L4 parasites. Immediate anthelmintic treatment of the remaining animals was recommended in addition to provision of supplementary concentrate.

These cases were noteworthy as both husk and PGE are uncommon in suckler herds, especially in older animals which are not in their first grazing season. This year's very dry hot spring may account, in part, for these cases, as suckler cattle are usually considered to have sufficient exposure to parasites during grazing seasons to become immunised, yet the findings in both cases suggested a lack of protection. The spring weather will have significantly reduced exposure to the parasites on pasture, and the grazing and worming history of the herds may indicate why such a severe reaction to the parasites occurred this year. Practitioners should consider husk as a differential for coughing in all herds, and at any age, if cattle are at pasture. PGE is possible in any grazing animals which are failing to thrive and especially if diarrhoeic; it should be borne in mind that faecal worm egg counts are less reliable for identifying significant parasite burdens in cattle, compared with sheep. Further advice on parasitic diseases and their control is available at <https://www.cattleparasites.org.uk/>.

## **'Tyre wire' disease and abomasal pathology**

In England and Wales a total of 409 diagnoses of traumatic reticuloperitonitis were made from 2002 to 2020, with 333 (81.4%) of the cases in dairy herds and 386 (94.4%) in adult animals. A range of different foreign bodies has been identified, with broken wires (mostly from rotting vehicle tyres which are used to weight silage clamp covers, and from fencing) reported to be most commonly associated with lesions in a slaughterhouse survey (Cramers and others 2005). Nails and screws can similarly penetrate the wall of the reticulum, in addition to other metallic objects including broken mixer wagon parts (Daniel and Smith 2008) and metallic fragments attached to magnets (Orpin 2007).

An unusual manifestation of disease was identified at APHA Carmarthen VIC. Two dairy cows in a large herd were found recumbent. The herd was being fed a total mixed ration and it was reported that a new silage clamp had recently been started. Both animals died before treatment could be attempted and one was received for postmortem examination. Fibrous adhesions were present between the liver, diaphragm, abdominal wall and the abomasum. There were necrotic and purulent tracts within the wall of the abomasum, and within one of these was a three centimetre tyre wire (Figure 3 shows a typical incident). The findings indicated that, in this cow, the ingested wire had passed from the fore-stomachs into the abomasum where it had penetrated the abomasal wall causing purulent infection and localised peritonitis. The rumen was distended with feed but there was very little intestinal content, suggesting that the abomasal pathology had prevented the passage of ingesta. Within the liver were irregular small pale lesions, which were likely caused by embolic infection secondary to the abomasal lesions, and were probably the cause of death.

When alimentary tract lesions caused by tyre wires are identified it is essential to assess all tyres being used to weight silage sheets on the farm. Any tyres which are disintegrating should be disposed of at a waste recycling centre. In view of this risk, ideally tyres should not be used at all for this purpose, and an alternative means of weighting, such as straw bales or gravel bags, is preferable. The use of magnetic boluses for cows and installation of magnets in the mixer wagon on farms where the disease is identified, can reduce the future risk of alimentary tract lesions.





**Figure 3 Typical case of reticuloperitonitis caused by tyre wire, shown *in situ*, in this example involving the pericardium**

### **Abortion outbreak associated with feeding spoilt straights in a dairy herd**

An aborted calf was submitted from a 400-cow herd, to investigate five abortions in a month. No infectious agents were identified. It was reported that a considerable number of the milking cows were diarrhoeic, and subsequently 12 more abortions occurred over a 24-hour period. No infectious cause was identified, including *Salmonella* spp and Schmallenberg virus (SBV), following further diagnostic testing. When the practitioner visited the herd, the farmer admitted feeding poor quality brewer's grains which were visibly mouldy; these were discarded and fresh feed provided, following which no further abortions or diarrhoea were reported. This is salient reminder that, in addition to examination of suitable fetal and placenta samples, assessment of the management, treatments and feed quality should be included when investigating outbreaks of abortion and other disease manifestations.

### **Metabolic disease in recently-imported dairy heifers**

A pregnant dairy heifer was examined postmortem. She was one of a group of 70 imported from Europe one month earlier. They were due to calve in one month; however, recently, one other animal had aborted, another was ill and pyrexia, and a third became weak, recumbent and ataxic before it died. The heifer submitted had noticeably yellow carcass fat, the liver was enlarged, orange in colour and friable, and had a fatty texture. Fatty liver disease was diagnosed by histopathology which confirmed a severe diffuse vacuolar hepatopathy.

Metabolic disease has been identified previously in imported heifers, and especially those which are in late pregnancy. Although the animals appear to arrive in the UK in a fit condition, transportation is a stressor. After arrival at the purchaser's farm, heifers may fail to adapt sufficiently quickly to the management and feed provided. These factors can



precipitate metabolic problems, ultimately leading to irreversible fatty liver disease, as in this case. In some incidents it appears that imported heifers have not previously experienced being at pasture and when they come to the UK and are only given access to grass they may fail to adapt to pasture grazing. A letter to the Veterinary Record (Hepple and others 2010) reported several such cases and warned of these risks when importing of pregnant dairy heifers.

### **Colisepticaemia in a suckler calf precipitated by *Anaplasma phagocytophilum* infection (tick-borne fever) and low selenium status**

A four-month-old calf had a history of malaise and recumbency before being found dead. Postmortem examination confirmed a fibrinous peritonitis and *E. coli* was isolated in septicaemic distribution from the liver, heart blood, lungs and kidney. Colisepticaemia is more commonly diagnosed in neonates, most often associated with insufficient colostral antibody absorption, and an underlying immunosuppressive factor was suspected in this older calf. Bovine Virus Diarrhoea Virus (BVDV) was not detected; however, *Anaplasma phagocytophilum* (the cause of 'tick borne fever') was confirmed in spleen by PCR. The liver selenium concentration of 0.61 mg/kg DM was below the reference interval (0.9-1.75 mg/kg DM); selenium is important for neutrophil function, suggesting that the low selenium status and tick borne fever both predisposed the calf to septicaemic *E. coli* infection.

### **Bovine papular stomatitis, chronic pneumonia and coccidiosis in dairy calves**

Two seven-month-old dairy heifer calves at pasture in a group of 40 were submitted to investigate respiratory signs, malaise and ill-thrift. Ten calves had been affected over a few days and one had died. Pneumonia was known to be a problem in the calves in this herd and investigations in 2019 confirmed bacterial pneumonias caused by *Mycoplasma bovis*, *Pasteurella multocida* and *Trueperella pyogenes*. An autogenous vaccine to *Mycoplasma bovis* was subsequently manufactured and used in the cows. The calves had received an intranasal respiratory virus vaccine at one week old and had been given their first dose of an IBR marker live vaccine. A modified live BVD vaccine was also used on the farm.

At the time of submission six of the calves had scabby lesions on the facial skin, two had conjunctivitis and suspected ringworm lesions were on the necks of two.

Numerous scabs and crusts were present on the muzzles and around the lips with a few scabs around the eyes (Figures 4 and 5). Pneumonia and enteritis were also identified. In one of the calves there was a low coccidial oocyst count of 2050 oocysts per gram in soft consistency faeces, with 88% of these *Eimeria bovis*, *E. zuernii* and *E. alabamensis* which are all pathogenic. *Mycoplasma bovis* was identified in the lungs of both animals. Histopathology indicated a proliferative dermatitis suggestive of viral infection and parapoxvirus was detected by electron microscopy confirming bovine papular stomatitis (BPS). The pneumonic pathology was chronic and aetiologically non-specific, reflecting the history of past bouts of clinical pneumonia. The findings indicated that the debility caused by chronic pneumonia and alimentary disease facilitated marked lesions of BPS; infection

by BPS virus usually occurs in younger animals where it typically causes little or no pathology. However, occasional severe manifestations of BPS can arise in animals if stressed or suffering other diseases.



**Figure 4 Multifocal skin lesions of Bovine Papular Stomatitis around the eye of a calf**



**Figure 5 Extensive skin lesions of BPS clustered near the muzzle**

### **Chiari-type II malformation and spina bifida in a stillborn calf**

A Chiari-type II malformation and spina bifida were found on postmortem examination of a deformed stillborn full-term calf which was delivered with veterinary assistance. There had been four deformed calves born this year (all sired by a red Limousin bull) within a herd of 270 Friesian x Swiss Red dairy cows. The farm uses AI and also had another stock bull. The herd is vaccinated against BVD virus, leptospirosis, IBR and lungworm. At the time of submission the cows were out at grass during the day, and inside at night with silage and a concentrate blend fed.

The calf had poorly developed hind quarter muscles and arthrogryposis of all four limbs with the hind limbs most severely affected. There was a nine centimetre long midline skin defect in the lumbar sacral region, overlying the spine (Figure 6).



**Figure 6 Skin defect in Chiari-type 2 malformation**

The calf had a flattened skull and the foramen magnum was large. The cerebral hemispheres were elongated and flattened, with the occipital lobes having square margins. The cerebellum and brain stem were displaced caudally into the foramen magnum and atlas canal, with some overlying of the anterior spinal cord (Figures 7 and 8). These findings were consistent with Chiari-type II malformation, which involves defective development of the skull, and subsequent herniation of the cerebellum through the foramen magnum. This causes compression of the brainstem and cranial cervical spinal cord and results in obstruction of the cerebrospinal fluid channels. The caudal lumbosacral defect was characteristic of spina bifida which is a failure of closure of the neural tube at the caudal extent of the spine. There were no other significant findings with negative PCR results for SBV and BVD virus. The dam was SBV seronegative. Histopathological examination found marked diffuse congestion within the brain and mild unilateral ventricular dilatation. Within the cranial cervical spinal cord there was marked dilation (with syringomyelia) of the central canal.





**Figure 7 Chiari-type 2 malformation: caudal displacement of the cerebellum and brainstem (arrow)**



**Figure 8 Chiari-type 2 malformation: cerebellum overlying the spinal cord (arrow)**

Chiari-type malformations and spina bifida are unusual sporadic findings in cattle. The aetiology is not fully established and may have a genetic component. The limb abnormalities (arthrogryposis and poor skeletal muscle development) in this calf were

considered to be secondary to the nervous system abnormalities. No further cases were reported.

## Changes in disease patterns and risk factors

Please refer to the annexe on Gov.uk for more information on the data and analysis.

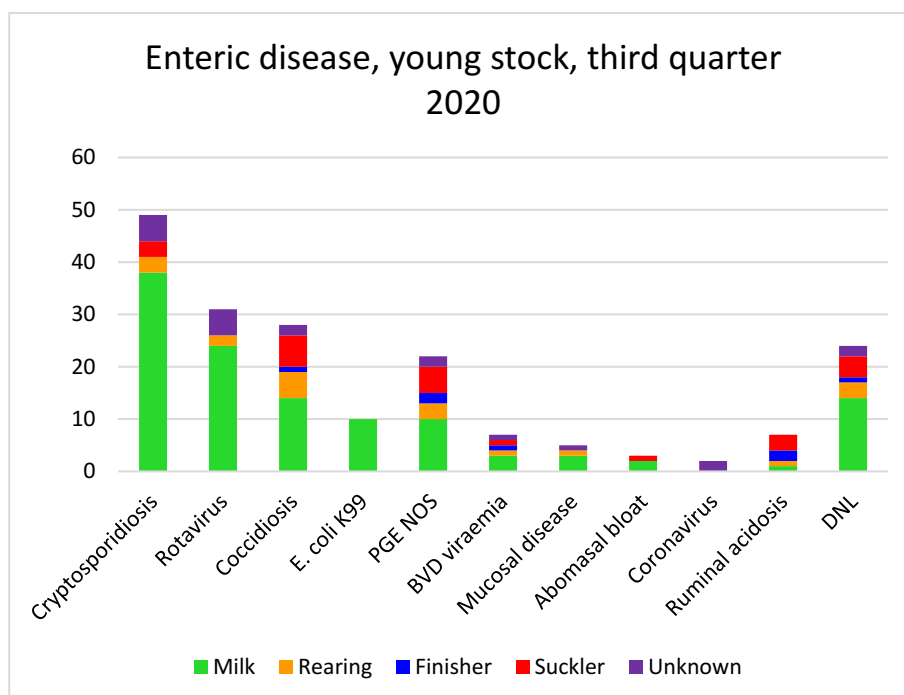
### Enteric system

The *Salmonella* in Livestock Production in GB 2019 has been published on Gov.uk:

<https://www.gov.uk/government/publications/salmonella-in-livestock-production-in-great-britain>

### Cryptosporidiosis

Cryptosporidiosis remains the most frequently diagnosed cause of diarrhoea in unweaned youngstock (Figure 9), and Q3 2020 was no exception. There was an increase in incidents diagnosed by APHA as a percentage of diagnosable submissions to levels seen in 2016 (Figure 10), but not by SRUC. This trend will continue to be monitored by the Cattle Expert Group.



**Figure 9 Enteric disease diagnoses, Q3 2020**

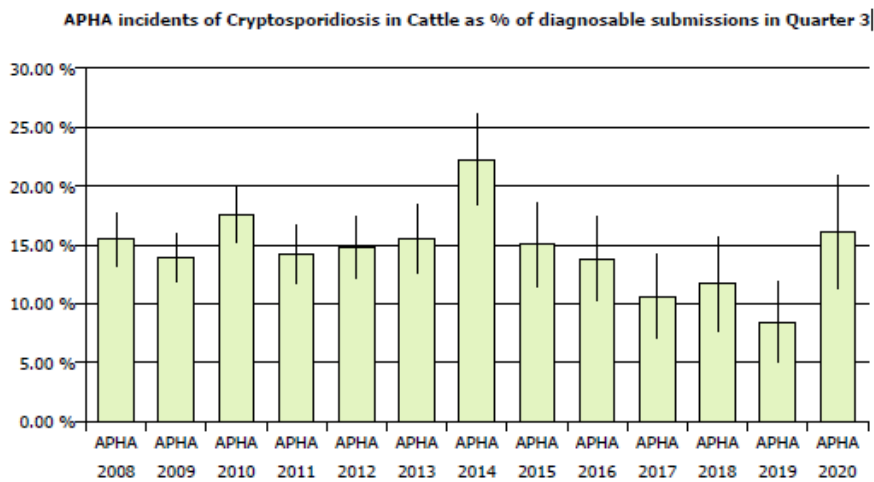


Figure 10 Incidents of cryptosporidiosis as % of diagnosable submissions, Q3 2020 (APHA data)

## Respiratory system

### Disease associated with *Histophilus somni*

The rising trend in percentage of diagnosable submissions where *Histophilus somni* was detected has continued into Q3 (Figure 11). Both at Great Britain level but also at APHA and SRUC levels, respectively, this quarter has seen an all-time high since records began in 2004. The biggest increase was observed in Scottish submissions. The Cattle Expert Group will continue to monitor this trend.

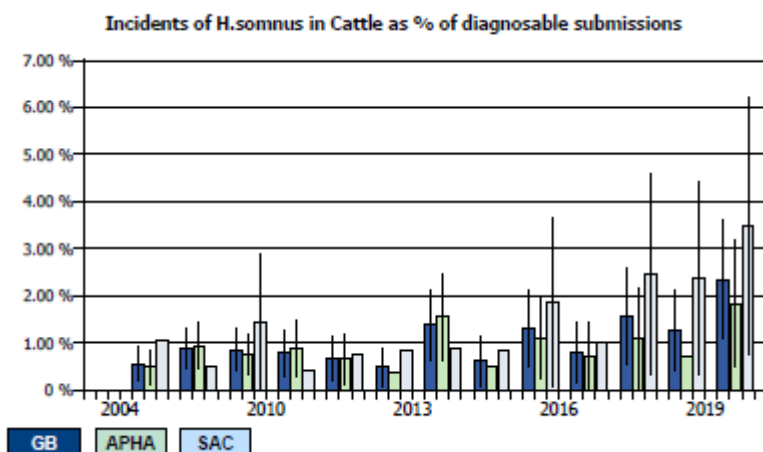


Figure 11 Incidents of *Histophilus somni* as % of diagnosable submissions, Q3 2004-2020

### Husk

As expected, cases of **parasitic pneumonia** (husk) were reported in Q3. For the second year in a row, Scotland has seen a rise in the percentage of diagnosable submissions in

Q3 and the level is now the highest seen since records began although the increase is not statistically significant (Figure 12). The situation is not mirrored by APHA numbers where, overall, the percentage of diagnosable submissions is following a downward trend.

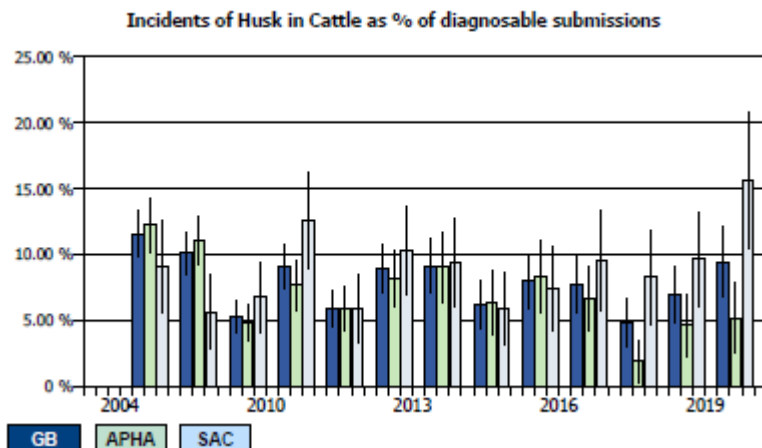


Figure 12 Incidents of husk (dictyocaulosis) as % of diagnosable submissions, Q3 2004-2020

### Mycoplasma bovis diagnoses

The percentage of diagnosable submissions where *Mycoplasma bovis* was detected increased in Q3. As with parasitic pneumonia, Scotland has seen a large increase in Q3 of this year (Figure 13). The number of diagnoses has actually increased this quarter although the number of submissions is lower than the same quarter of the previous year. This does not apply to England and Wales, where a decrease was actually recorded in Q3 of 2020. The Cattle Expert Group will continue to monitor these trends.

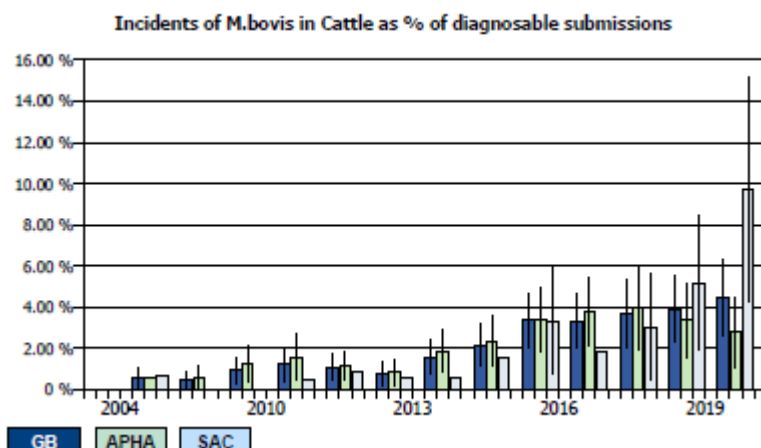


Figure 13 Incidents of *Mycoplasma bovis* pneumonia as % of diagnosable submissions, Q3 2004-2020



# Horizon scanning

## Bluetongue (BTV) update

**BTV-8** has been reported in southwest France and Luxembourg during September and October. On 14 October, two new outbreaks were also reported in cattle in Germany, close to the border with Luxembourg.

In France, 32 new outbreaks of BTV-8 have been reported via the Animal Disease Notification System (ADNS). Sixteen of these outbreaks have been in cattle and sixteen in sheep. All these reports were confirmed as clinical cases with affected animals showing signs including depression, anorexia, pyrexia, congestion of the mucous membranes and abortion.

Luxembourg, Germany and Croatia have reported cases of BTV-8 in cattle and Bulgaria have reported cases of BTV-8 in deer.

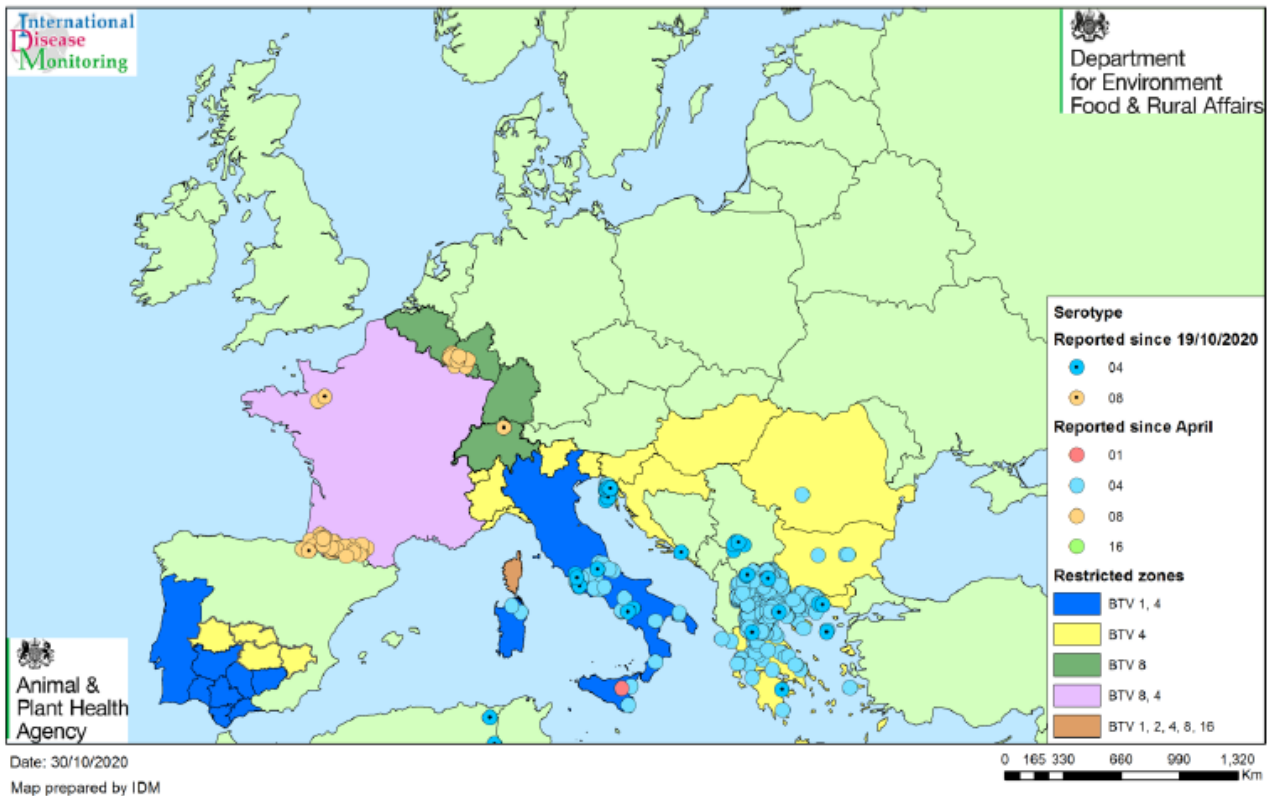
**BTV-4** has continued to spread widely across southeast Europe, with several outbreaks being reported in Greece and in the Republic of North Macedonia and continued reports in Italy and Romania. In October, both Bulgaria and Croatia reported cases of BTV-4 for the first time this year.

In the Republic of North Macedonia just one of the 152 outbreaks of BTV-4 was in cattle, the rest being in sheep flocks.

Greece has reported 159 new cases of BTV-4 following passive surveillance (one in cattle, three in goats and 155 in sheep), Romania has reported one case and Italy four cases in sheep.

The current risk assessment of BTV-8-infected midges being carried by the wind into southern England from the near-continent, is considered to be **low**. The potential risk pathways for BTV-4 transmission from southern Europe into the UK are limited to importation of infected livestock, rather than windborne incursion of infected midges.

A map showing BTV reports in Europe May- October 2020 is shown in Figure 14.



Bluetongue disease in Europe: May - October 2020

**Figure 14 Bluetongue disease in Europe May - October 2020**

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

## Acorn poisoning

APHA issued an alert for the risk of toxicity due to ingestion of acorns, particularly in cattle and sheep.

<https://www.facebook.com/APHAGov/posts/1681947668637976>

## References

Cramers T, Mikkelsen KB, Andersen P, Enevoldsen C, Jensen HE. New type of foreign bodies and the effects of magnets in traumatic reticulitis in cows. *Vet Rec* 2005; **157**:287-9

Daniel R, Smith G. Suspected reticuloperitonitis associated with the metal components of a mixer wagon. *Vet Rec* 2008; **162**:563-4

Hepple S, Watkins G, Crawshaw T, Harwood D, Ellis-Iversen J, Clark J, Pollock A, Brough T. Risks to cattle transported long distances in late pregnancy. *Vet Rec* 2010; **167**:796

Orpin P. Traumatic reticuloperitonitis in cows. *Vet Rec* 2007; **160**:811



© Crown copyright 2020

### **Statement regarding use of this material**

The material in this report has been compiled by the Animal and Plant Health Agency (APHA) Surveillance Intelligence Unit in collaboration with the APHA Surveillance and Laboratory Services Department. Images are governed by Crown Copyright except where specifically acknowledged to have been provided by others external to APHA. Use of material directly from the report is acceptable provided APHA (or others where specifically indicated) is acknowledged as the owner of the material. This does not include use of the APHA logo which should be excluded, or used only after permission has been obtained from APHA Corporate Communications ([apha.corporatecommunications@apha.gov.uk](mailto:apha.corporatecommunications@apha.gov.uk)).

You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v.3. To view this licence visit [www.nationalarchives.gov.uk/doc/open-government-licence/version/3/](http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/) or email [PSI@nationalarchives.gsi.gov.uk](mailto:PSI@nationalarchives.gsi.gov.uk)

This publication is available at <https://www.gov.uk/government/collections/animal-disease-surveillance-reports>

Any enquiries regarding this publication should be sent to us at [SIU@apha.gov.uk](mailto:SIU@apha.gov.uk)

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

The Animal and Plant Health Agency (APHA) is an executive agency of the Department for Environment, Food & Rural Affairs, and also works on behalf of the Scottish Government and Welsh Government.