



Animal &
Plant Health
Agency



GB small ruminant quarterly report

Disease surveillance and emerging threats

Volume 23: Q3 – July - September 2020

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- Cobalt deficiency diagnosed in negated bluetongue report case – page 9
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Editor: Amanda Carson, APHA Penrith
Phone: + 44 (0) 7909532229
Email: Amanda.carson@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 post mortem providers and intelligence gathered through the Small Ruminant Species Expert 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 & Trends

Weather

Following a warm and largely dry spring the summer became more unsettled. The UK overall had 122% of average rainfall for July and was again wet in August with more than double the average rainfall in places (Figure 1). July was a cool month, particularly for maximum temperatures which were 2 °C below average in parts of north-west England (Figure 2). This led to poor growth of crops with lower grain yields during the harvest period and lower availability of straw for bedding.

APHA updated the guidance on bedding shortages in response to concerns about straw shortages developing and straw price rises across the country in autumn 2020. The wet winter, followed by the prolonged dry spring and August heatwave, has affected straw yields

<http://apha.defra.gov.uk/documents/surveillance/diseases/bedding-shortage-info-jan18.pdf>

The NADIS provisional Autumn fluke forecast for 2020 is based on temperature and rainfall data for the months of May-August. This is predicting High risk in southern parts of Scotland, north Wales, northeast England and Northern Ireland, medium risk in northern Scotland, south Wales and southeast England and low risk everywhere else.

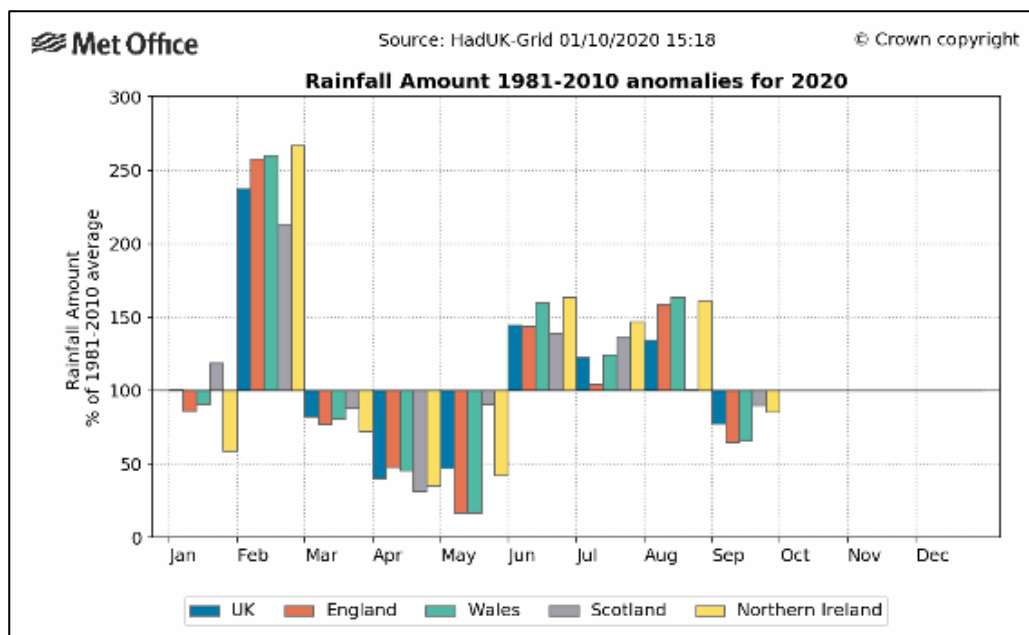


Figure 1 Rainfall amount 1981 -2010 anomalies for 2020

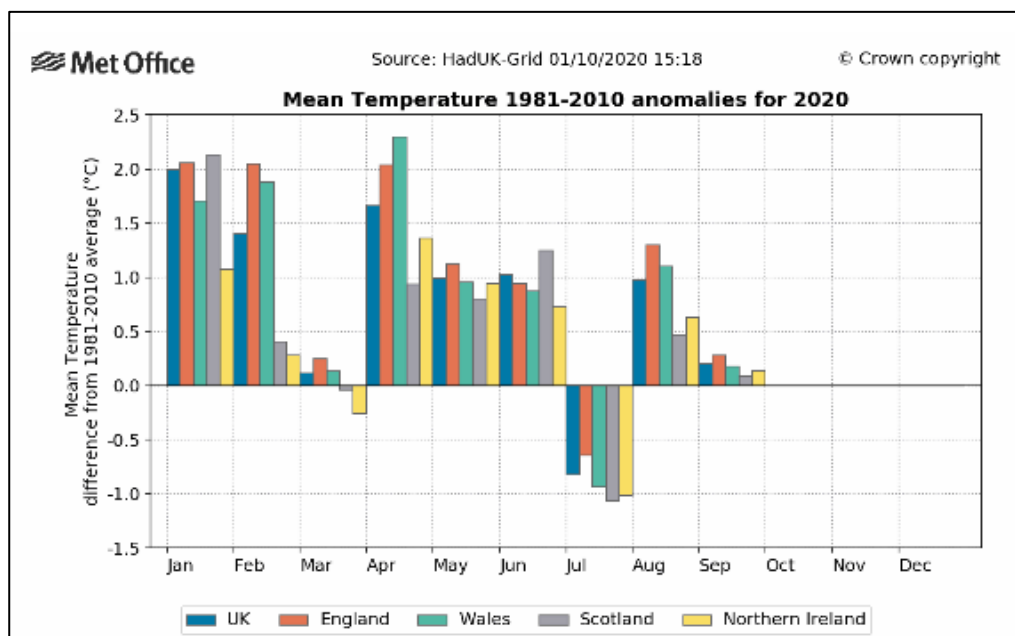


Figure 2 Mean temperature 1981 - 2010 anomalies for 2020

Industry

Lamb prices during Q3 2020 were notably more stable than during the previous quarter. Prices in the domestic market have remained above last year's levels throughout Q3. Retail sales have been above year earlier levels since June and takeaways have also been strong. Trade data suggests imports were down 6,600 tonnes (12%) for the first 8 months of the year. Exports were also down during the same period by 5,000 tonnes (8%) year-on-year. Export prices have been supported by a weak Sterling compared to the Euro, making UK exports more price competitive on the continent. Sheep meat production

during Q3 was up by 2,300 tonnes (3%) year-on-year totalling 83,400 tonnes. Q3 2020 production was also up by 18,500 tonnes on Q2 2020. Retail purchases of lamb increased during the twelve weeks ending 4 October; volumes were up by 9.5% year-on-year and average prices were up 4.1%. Moving into Q4, lamb prices have begun their seasonal decline. However, they remain relatively high for the time of year and firmly above the 5-year average.

Charlie Reeve, AHDB

New and re-emerging diseases and threats

Unusual diagnoses

Photosensitisation and laryngeal chondritis

The death of a Beltex tup was considered to be due to acute respiratory distress, caused by chronic, laryngeal chondritis. A concurrent photosensitisation reaction on the dorsum of the sheep is likely to have been a contributory factor. A total of six tups had died from a group of 60 over the previous month. The group were placed into the pasture in spring and had received no supplementary feed and there was no history of any vaccinations given to homebred or bought in tups. Trace element boluses had been administered one month previously. The submitted tup was described as being in pain when found and died soon afterwards.

Postmortem examination showed a large area of sunburnt bare skin on the dorsum measuring 60 x 15cm, extending into the deep subcutis (Figure 3). The dorsal area of the diaphragm, either side of the oesophagus, was thickened with a firm, fibrous texture and localised necrosis. The larynx was occluded by adhesions between the two arytenoid cartilages and there was necrosis and purulent material extending to the adjacent tracheal rings and musculature. The lymph nodes of the head and neck were purple and enlarged.



Figure 3 area of photosensitisation on the back of a sheep

Trueperella pyogenes was recovered in a heavy growth from the purulent material surrounding the larynx. Histopathology of the liver showed multifocal necrosis of centrilobular to paracentral hepatocytes with infiltrates of neutrophils and rare fibrin thrombi. These acute changes were considered to be associated with terminal hypoxia and disseminated intravascular coagulopathy secondary to laryngeal chondritis/airway occlusion. Histology also identified an extensive, chronic organising myopathy of the diaphragm, which may have been secondary to trauma or over-exertion and possibly related to increased respiratory effort associated with laryngeal chondritis/airway occlusion. The pain and discomfort from the skin lesions would have impacted markedly on the tup's already compromised respiratory effort. There were no hepatic changes supportive of secondary photosensitisation thus primary photosensitisation or possibly vitamin B12 deficiency may have been involved.

Following tupping, when tups are separated from the main flock, they can miss out on the routine management practices of vaccination, worming and ectoparasitic treatment when they are applied to ewes and lambs. Nevertheless they are an important category of stock and costly to replace and flock health plans should include a management strategy specifically designed for the tups especially focussing on the pre-tupping period. It takes six weeks for sperm production and management should commence well in advance of tupping with attention to body condition with supplementary feeding as required, assessment of trace elements, especially selenium as this is a critical component of the spermatozoa tail and an overall assessment of their capacity to function during the breeding season.

Haemonchosis

During August and September there was an increased number of submissions to APHA Veterinary Investigation Centres (VICs) and partner postmortem sites in which the history indicated weight loss, diarrhoea and death. *Haemonchus* species nematodes were identified in numerous cases.

In one incident three shearling ewes were submitted from a group of 200 milking ewes, with a history of poor body condition and five deaths. They had been treated with monepantel three weeks earlier with supplementary feeding commencing at the same time. The submitted ewes were notably pale, with submandibular oedema, watery blood (Figure 4) and in poor condition, weighing only 22, 31 and 33kg. The liver and kidneys of all the sheep were pale and there was excess serous fluid in the abdomen and thorax. Oedema was evident in the lungs and in the abomasal mucosa with worms visible in the abomasal contents of all three ewes. Large numbers of *Haemonchus* spp worms, together with significant numbers of other nematode species and many immature worms, were identified on GI tract examinations (Table 1), confirming the diagnosis and reason for the anaemia and ill thrift.

Table 1 Postmortem examination gastrointestinal total worm counts for two ewes

Total worm count	1 (GI tract)	2 (GI tract)
Abo <i>Haemonchus</i> spp.	11000	27000
Abo <i>T. axei</i>	1500	<100
Abo <i>Teladorsagia/Ostertagia</i> spp.	3000	7000
Abo Immature / L4	26000	89000
SI - <i>Cooperia</i> spp.	1500	1000
SI - <i>Nematodirus battus</i>	<100	100
SI - <i>Trichostrongylus</i> spp.	2400	1800
SI - Immature / L4	600	



Figure 4 Watery blood in abdominal cavity of ewe with haemonchosis

In a different case three young lambs presented with swollen heads, lethargy and pyrexia raising suspicion of Bluetongue (BTV). APHA investigated and ruled out BTV; however, pale mucous membranes and submandibular oedema were observed. Subsequent faecal worm egg counts were carried out by APHA Carmarthen VIC and differential fluorescent staining identified the presence of *Haemonchus*.

APHA alerted Private Veterinary Surgeons to the potential risk of *Haemonchus* in the August VIC Newsletter since this blood-sucking parasite may not be suspected as sheep frequently do not present with signs of diarrhoea. It has been a challenging season for parasite and grassland management with very dry conditions earlier in the year followed by wet and warm weather over the summer.

The recent warm weather may have favoured *H. contortus* predominance on pastures leading to disease in sheep. If *H. contortus* is the only gastro-intestinal (GI) parasite present then closantel or nitroxynil are effective, but cases have been seen where other GI nematodes are also present in significant numbers necessitating treatment with a broad spectrum anthelmintic.

If disease is only detected in lambs the risk to adult sheep should also be considered since clinical cases have been reported around the subsequent lambing period in adults following diagnosis in lambs the previous year.

More information can be found on APHA's parasitology page: <http://apha.defra.gov.uk/vet-gateway/surveillance/experts/parasitology.htm>.

Arthritis due to Erysipelas

A weaned lamb was submitted to APHA Shrewsbury VIC for post-mortem examination to investigate lameness in a group of 500 lambs. The group had been recently dipped,

wormed and turned out to grass. Approximately one-week post-dipping a number of lambs were noticed to be “tucked up” and tender on their feet. Over 100 became thin with 20 to 30 severely lame. There was no obvious swelling of the joints on external examination of the animal submitted although several of the joints contained abnormal joint fluid when disarticulated. Both stifles and a hock contained a large amount of pale green fluid and clumps of fibrinous necrotic material (Figure 5). There were reduced digesta present, the lungs were congested and the prescapular lymph nodes were enlarged. Bacterial cultures of joint fluid did not identify any significant bacteria, which is not uncommon in chronic cases. The clinical history and post-mortem findings were suggestive of arthritis due to *Erysipelothrix rhusiopathiae* infection and serology of a sample of joint fluid was positive for antibodies to erysipelas. A good response to broad spectrum antibiotic treatment was reported by the farm vet. In contrast to arthritis due to *Strep. dysgalatiae*, infection with *E. rhusiopathiae* occurs in older lambs. *E. rhusiopathiae* is a soil borne organism and may gain access through any open wound / abrasion, however it is a less commonly diagnosed cause of inflammatory joint disease in sheep now as many flocks no longer dip and dips contain bacteriocides.

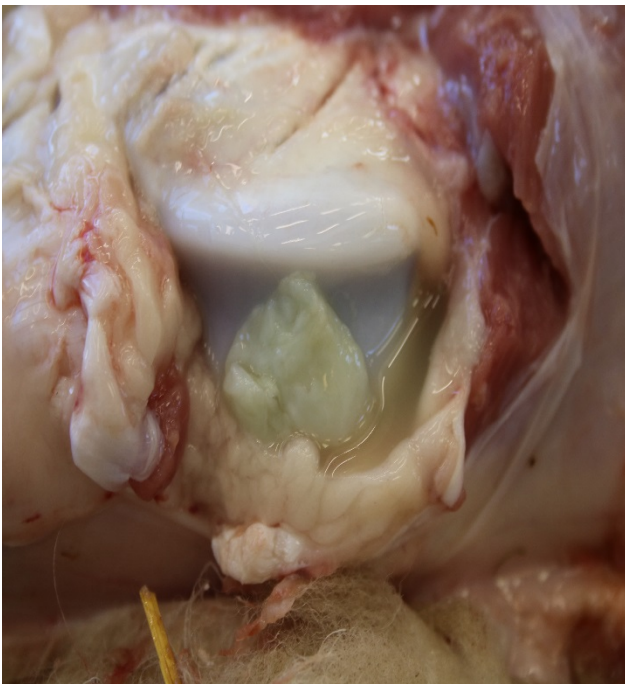


Figure 5 Increased synovial fluid and a large clump of fibrin within the stifle joint.

Neuroaxonal dystrophy

A case of neuroaxonal dystrophy with a proposed hereditary aetiology was diagnosed in a 15-month-old Zwartbles shearling submitted to APHA Penrith VIC for post-mortem examination. The shearling had developed gradual onset ataxia from approximately three to four months of age. When moved or stressed it would on occasion fall over and

struggle to regain a standing position. Close observation identified hind limb knuckling, with the left being more severe. There were no cranial nerve deficits and both appetite and water intake were normal. The shearling was one of a small flock of 40 maintained on the holding. Swayback was the primary differential and it was euthanased on the day of submission. No gross abnormalities were noted during post-mortem examination and histopathology of the brain and spinal cord was progressed once the tissues were sufficiently fixed. In the spinal cord there was mild to moderate, chronic axonal degeneration whilst in the brain there was focally extensive, chronic neuroaxonal degeneration and neuronal necrosis. Congenital axonal dystrophies have been reported in a number of breeds of sheep including Suffolk sheep in California; Coopworth, Romney and Perendale sheep in New Zealand; Merino sheep in Australia. Axonal dystrophy has been previously identified in Zwartbles sheep in 2015 with a familial link proposed. Advice was provided including a review of the breeding records for the flock.

BTV negated case investigation

Bluetongue was initially suspected following the death of two lambs from a group of 350, and six others were found unwell with oedema of the head and forelegs and crusting of the ears. Testing of the affected lambs by APHA field service negated Bluetongue and two typical cases were then euthanased and were submitted to APHA Starcross VIC for post-mortem examination. Examination identified extensive scabbing and crusting of the skin of the head, ears and eyelids of both lambs. In one lamb the tips of both ears were missing, leaving only scabby stumps and there was extensive scabbing of the skin with wool loss along the dorsum of the back. The livers were pale and friable. Liver cobalt levels were below the reference range at 0.05 mg/kg DM and 0.04 mg/kg DM. Histopathology confirmed photosensitisation as the cause for the skin lesions. In light of the above cobalt results Ovine White Liver Syndrome as a result of Cobalt deficiency was considered the most likely cause, and cobalt supplementation of the group was recommended. In addition, numerous purulent foci were scattered throughout the lungs of the second lamb from which *Staphylococcus aureus* was isolated in pure profuse growth. Haematogenous spread from the infected ear skin was the suspected source.

Changes in disease patterns and risk factors

Syndromic analysis

Most common diagnoses Q3 2020

During Q3 2020, 919 diagnostic submissions were received in GB and the presenting signs of sheep and age category from which samples/carcases were submitted, with age group for submissions (Figure 6) and Found Dead the most common sign (Figure 7).

Age Category	
Adult	210
Mixed	21
Postwean	248
Prewean	141
Unknown/other	299

Figure 6 Age group of sheep in submissions Q3 2020

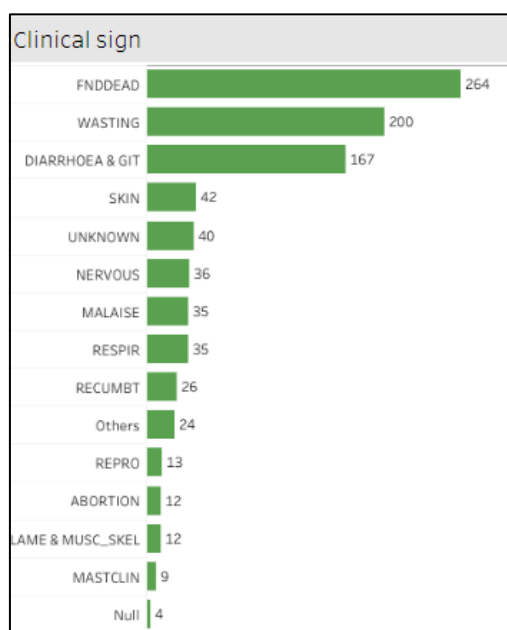


Figure 7 presenting signs of sheep in submissions Q3 2020

The most common VIDA diagnoses are shown in Figure 8.

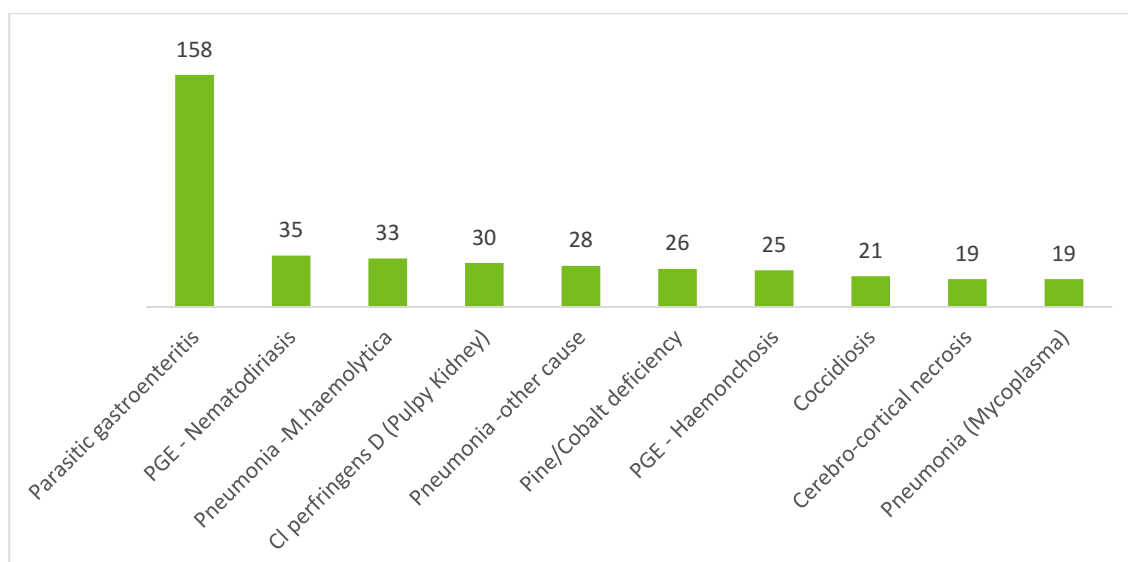


Figure 8 Most common VIDA diagnoses Q3 2020

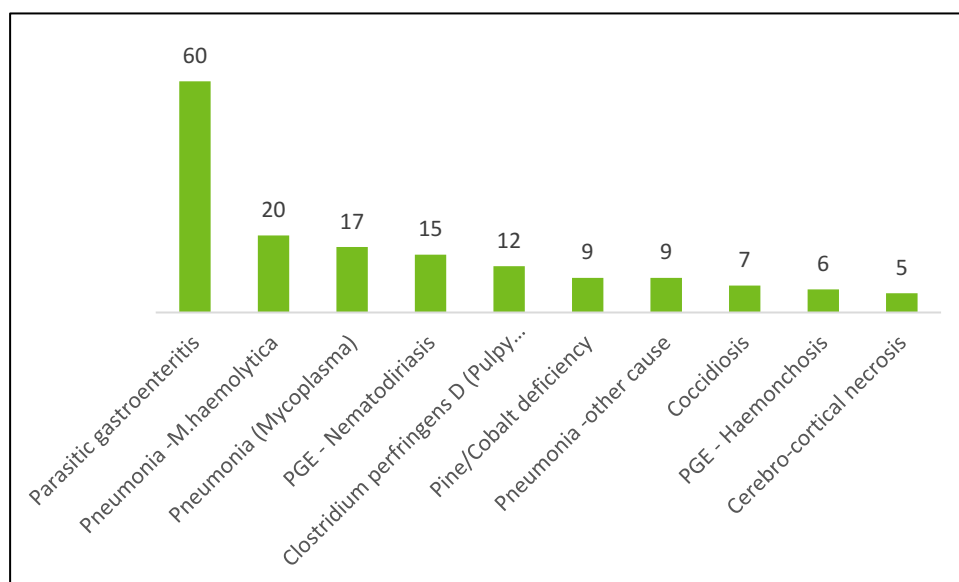


Figure 9 Most common diagnoses in post weaned lambs Q3 2020

Syndromic alerts were raised this quarter for the following diseases:

PGE – Nematodirosis, Cl. perfringens D infection, PGE – Haemonchosis, Pneumonia due to Mycoplasma ovipneumoniae, Cerebrocortical necrosis, Orf/Contagious pustular dermatitis, These alerts allow members of the SR SEG to review cases for these diagnoses and provide comment in the quarterly report.

Parasitology

Parasitic gastroenteritis (PGE)

Throughout this quarter diagnoses of PGE in lambs were made, reflecting in many cases the dry Spring and the high larval challenge then experienced in the warm wet summer. Examination of the gastro-intestinal tract often detected large numbers of immature parasites which would not yet be contributing to the faecal egg count. Cases of suspect macrocyclic lactone as well as benzimidazole anthelmintic resistance were encountered causing clinical signs and death of lambs.

Nematodirus battus also was detected throughout this period with other GI nematodes, in support of the suggestion that this parasite is changing to becoming present in lambs throughout their first grazing season. See Figure 10 Incidents of PGE nematodiosis diagnosed as % diagnoseable submissions in GB 2008-2020

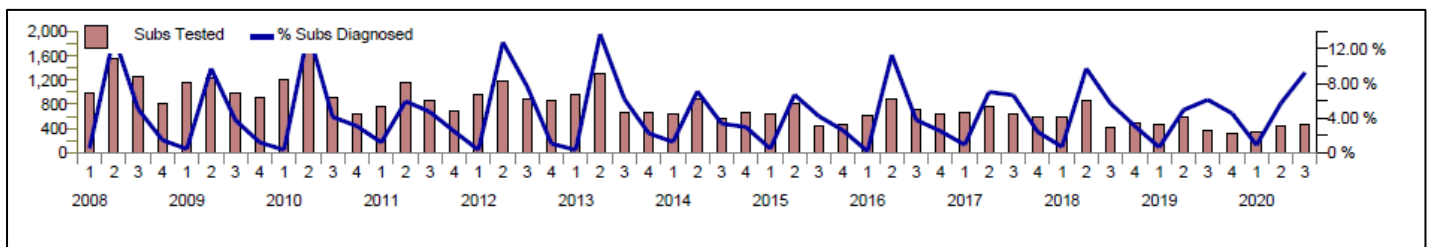


Figure 10 Incidents of PGE nematodiosis diagnosed as % diagnoseable submissions in GB 2008-2020

The importance of farmers monitoring the changing parasite picture on their farm from year to year and being able to access correct advice to treat and control parasites is essential. Efforts on many farms will also have to be made to reduce reliance on anthelmintic treatments.

PGE Haemonchosis

Since 2017 APHA have tended to diagnose PGE due to *Haemonchus contortus* more commonly in GB (Figure 11), with the peak occurring in this quarter (July to September) of the year. Disease was diagnosed in both lambs and adults. Warmer temperatures and the high fecundity of this parasite allows it to predominate on the pasture.

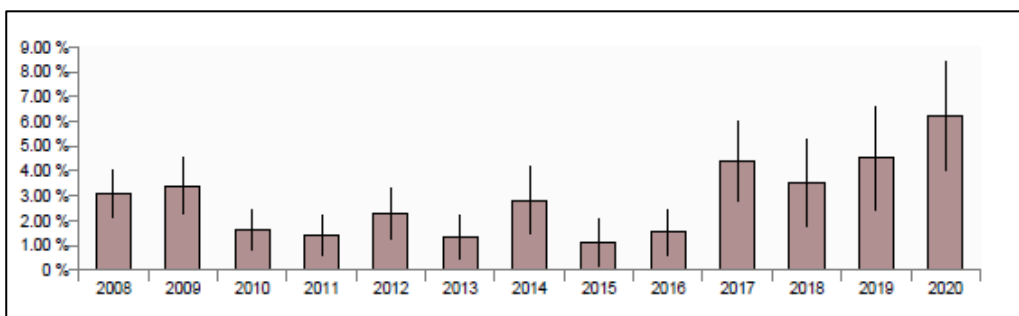


Figure 11 Annual GB Incidents of *Haemonchus* in sheep as % diagnosable submissions

A warning to be alert for haemonchosis was issued to veterinary surgeons in July 2020 and Figure 12 shows the location of PGE haemonchosis diagnoses in sheep July- Sept 2020 by county

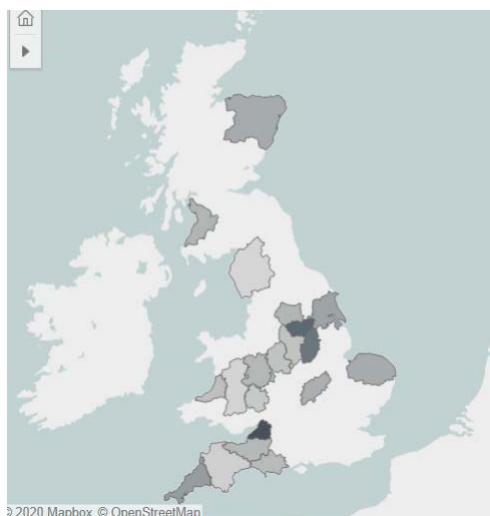


Figure 12 Location of PGE haemonchosis diagnoses in sheep July- Sept 2020 by county

Liver Fluke

. Liver fluke continues to be of low incidence across the country with no cases of acute fluke recorded during Q3 2020. SCOPS issued a liver fluke disease alert for farmers and vets to encourage the use of this season's lambs as sentinels and to test them using a blood Elisa test before considering treatment of the main flock. Fluke treatments have no persistency and therefore do not protect animals against re-infection. If sheep are treated before peak infection has occurred and they remain on infected (flukey) pasture, they are still at risk. Therefore treating sheep as a routine at the wrong time of year can waste time and money.

<https://www.scops.org.uk/news/9247/liver-fluke-2020-sheep-farmers-advised-to-use-blood-testing-before-treating-this-autumn/>

A study as part of the Hill Sheep North EIP Agri project carried out in Cumbria and Yorkshire has used serological testing of lambs. Matt Linnet at Millcroft Vets produced a map (Figure 13) showing the results of testing carried out so far on some of the farms in the project and created a traffic light system to illustrate the risks which were shared with all the farmers in the group. Sentinel testing continues.

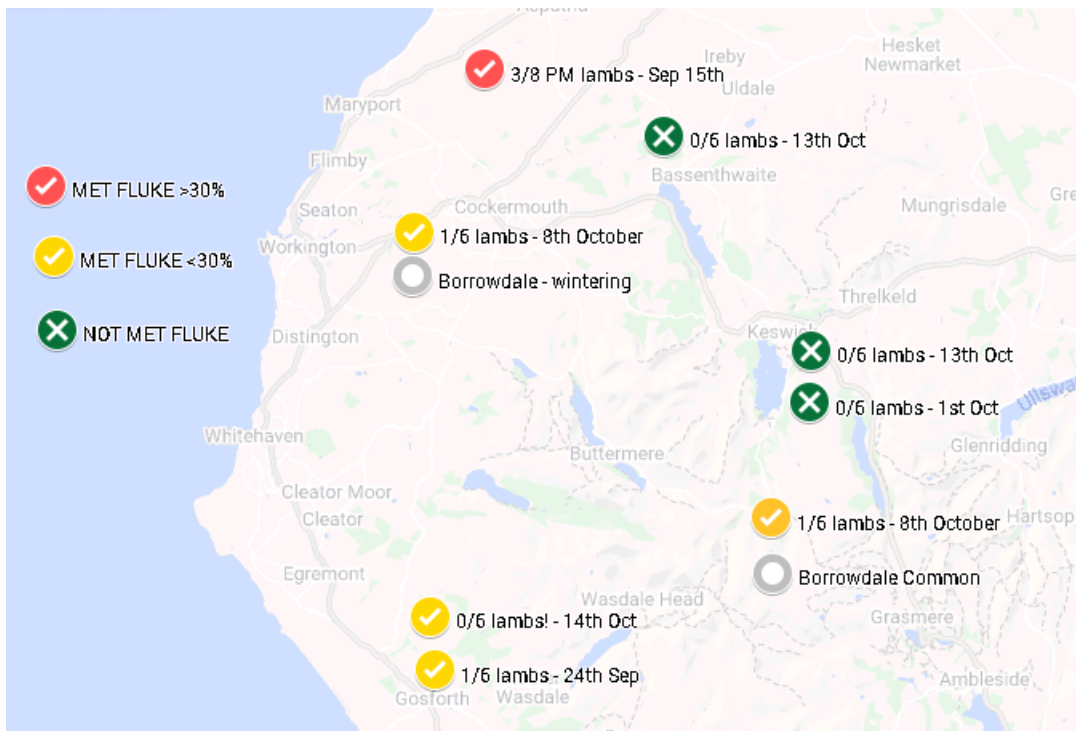


Figure 13 Map of sentinel lambs fluke ELISA results

Tick-associated disease

Tick borne fever (*Anaplasma phagocytophilum*)

A comparison of the diagnostic rates for tick borne fever over the last 12 months when compared to the previous 60 months identified an increasing trend in diagnoses from preweaned and postweaned lambs from upland farms in Wales and the South West of England.

There have been several cases this quarter where tick borne fever was diagnosed, and was potentially contributing to the severity of a range of disease issues in sheep flocks.

Skin haemorrhaging in a ewe with clostridial enterotoxaemia and tick borne fever

An adult Dorset ewe, one of a group of 241, became unwell and died. Petechial haemorrhaging was evident in the skin of the ears, udder, brisket and medial aspect of the legs. Another ewe and a ram had been recently found dead with similar skin haemorrhages. Fluid and fibrin in the thorax and pericardial sac suggested the ewe had died as a result of a septicaemia/toxaemia. Bacteriological cultures remained sterile and testing for *Clostridium perfringens* toxins gave negative results. The case was further investigated by histopathological examination of the brain. The pattern of the brain lesions was unusual, with the distribution of the lesions spanning a number aetiologies, however a combination of both thiamine-dependent cerebrocortical necrosis (CCN) and *C perfringens* epsilon intoxication was deemed the most probable. A change of pasture may have

initiated both conditions. The ewe also tested positive for tick borne fever (*Anaplasma phagocytophilum*) and this may have played an immunosuppressive role in the disease presentation. This ewe and the other affected animals were from a new batch of purchased animals and may have been naïve to and therefore more significantly affected by tick borne fever (TBF), compared to the home bred animals. The cause of the skin petechiae in the thin haired or hairless skin sites were speculated to have been as a result of *Culicoides* midge bites in an animal with an increased bleeding tendency due to thrombocytopaenia, vasculitis or potentially the toxæmic effects, as a result of combined tick borne fever and clostridial enterotoxaemia.

Tickborne fever and tick pyaemia in a 5-month-old lamb

A 5-month-old lamb was the sixth to die in a group of 500. The lamb was in poor condition and had become recumbent with tachypnoea noted prior to death. Postmortem examination found two 1cm diameter subcutaneous abscesses on the left dorsal body wall, erosions on the tongue, oesophageal and abomasal mucosa, lung congestion, inflamed intestinal mucosa, diarrhoea and lymphadenopathy of bronchial and mesenteric nodes. *Staphylococcus aureus* was cultured from liver and lung, consistent with a diagnosis of tick pyaemia. PCR testing for *Anaplasma phagocytophilum* was positive, confirming tickborne fever. *A. phagocytophilum* is transmitted by *Ixodes ricinus* and multiplies in neutrophils leading to profound neutropenia. This immunosuppressive effect predisposes to a range of concurrent infections including systemic *Staphylococcus aureus*.

Neurological disease due to tick borne fever infection

From a group of sheep grazing upland pasture for the first time, several were reported to become recumbent, seizure and died. The PVS submitted fixed brain and fresh spleen for examination. Histopathology identified diffuse, chronic, lymphoplasmacytic choroiditis with multifocal encephalomalacia. Testing of the spleen identified *Anaplasma phagocytophilum* by PCR, confirming tick borne fever (TBF). TBF does not typically produce the histopathological lesions reported although can predispose affected animals to secondary infections. Immunohistochemistry for louping ill virus was carried out but was negative.

Tick pyaemia in lambs in GB is normally caused by infestation with *I. ricinus*, however this year APHA has demonstrated for the first time that *Haemaphysalis punctata* is capable of inducing tick pyaemia in lambs. Since 2002, 114 cases of tick pyaemia were diagnosed by APHA and SAC in GB and 78% of these diagnoses were made between April to June. In severe outbreaks up to 30% of the lambs in the group can be affected. Tick pyaemia prevention depends on tick control and there is no successful treatment for affected animals. Farms at risk of ticks need a plan that is specific to their situation, including the choice and timing of control products, and the timing of movement of lambs onto pasture.

The lamb also had a light worm burden and marginal selenium deficiency; further monitoring of the remainder of the group was advised with supplementary feeding as required.

Severe pneumonia in growing lambs with concurrent tick borne disease

30 deaths in a group of post-weaned lambs lead to the submission of both carcasses and on-farm post-mortem samples for investigation. The deaths had started 10 days after the group were plunge dipped and wormed. The gross post-mortem findings in the submitted carcasses were all similar and consisted of pleurisy, pericarditis and pneumonia.

DDGE/PCR of fresh lung identified *Mycoplasma ovipneumoniae*, but unfortunately routine bacteriology was unrewarding. Lung histopathology confirmed a multifocal necrotising bacterial bronchopneumonia which pointed towards the involvement of *Mannheimia haemolytica* / *Bibersteinia trehalosi* / *Pasteurella multocida*. In addition, one of the lambs submitted was positive by PCR for *Anaplasma phagocytophilum* (tick borne fever). The combination of stress as a result of gathering for dipping/worming and the presence of the immunosuppressive tick borne fever agent were suspected as the predisposing factors for disease development in this case.

More information on tick pyaemia and tickborne diseases can be found on these recent articles:

[Tickborne diseases of sheep](#)

<https://vetrecordcasereports.bmj.com/content/8/4/e001267.full>

Metabolic disease

Pine / cobalt deficiency cases in this quarter

Cobalt deficiency and hyposelenaemia were the two most common diagnoses for systemic and miscellaneous disease this quarter, with each being diagnosed in 13% of submissions for this syndrome. The main concurrent diseases diagnosed with pine/cobalt deficiency for this quarter were parasitic gastroenteritis (PGE) in 26% of cases and hyposelenaemia in 24% of cases. It is difficult to determine whether the PGE lead to the cobalt deficiency, or whether the trace element deficiencies predisposed to PGE; but it was likely to be a combination of both of these.

Two post-weaned lambs were submitted for post-mortem examination to investigate wasting and skin lesions. The farmer reported historical issues with ill-thrift in the lambs. In 2020 the problem had continued and the decision had been taken to investigate further. Over a period of two days, two lambs from a group of 350 had died and six others were found unwell, with oedema of the head and forelegs, and crusting of the ears. The suspicion of Bluetongue was raised and this was investigated by APHA and negated.

The main gross findings were extensive scabbing and crusting of the skin of the head, ears and eyelids (Figure 14); an increased volume of pale peritoneal fluid; and the livers

were friable and had a distinct reticular pattern to the cut surface. In addition, one lamb had extensive scabbing of the skin, with wool loss, along the dorsum. The gross changes in the skin were suggestive of photosensitisation and the skin histopathology was consistent with this. The liver histopathological changes were quite mild and did not fully fit with the spectrum of changes normally seen for toxic plants, such as Ragwort or Bog Asphodel. They were more suggestive of Ovine White Liver Syndrome and liver biochemistry testing revealed low liver cobalt levels Table 2.



Figure 14 Extensive scabbing and crusting of the skin in a lamb with cobalt deficiency

Table 2 Liver cobalt levels in two lambs with skin and liver pathology

Test	Ref Range	Units	Lamb 1	Lamb 2
Cobalt (Liver)(‡)	>0.06	mg/kg DM	0.05	0.04

It was therefore possible that a hepatopathy, associated with ovine white liver disease, was the cause of the photosensitisation in one of the lambs; and likely that cobalt deficiency was contributing to the ill-thrift of both lambs. Crusting of the skin of the ear pinnae, and pallor of the liver, are the two most common gross pathologies detected in cobalt deficiency cases. Ongoing trace element testing of the flock and cobalt supplementation for this group of lambs was advised.

Skin disease

Cellulitis associated with *Fusobacterium necrophorum* in a doe

Fusobacterium necrophorum was considered to be the cause of head swelling and death in a 6 year old milking goat. The swelling was of acute onset, appearing three days prior to death. This was the only animal affected in a herd of 80. There had been a perceived improvement upon the introduction of anti-inflammatory treatment for what was suspected

to be an allergic reaction. The herd had received a clostridial booster injection 10 days prior to death. At PME:

- The tissues of the ventral jaw were swollen and firm.
- The subcutaneous tissues over the ventral neck were variably mottled pale and red with a small amount of red, fetid fluid
- The submandibular lymph nodes were enlarged and pale and the lymph nodes of the ventral neck were enlarged and reddened.

Bacteriology recovered *Fusobacterium necrophorum* from the fluid exuding from the neck tissues. Although no specific foci of origin was observed, an injection site was considered the most likely aetiology given the recent history. A review of injection techniques including restraint and needle cleanliness/hygiene was recommended.

Hepatogenous photosensitisation in a 4-month-old Welsh Mountain-type lamb

Two lambs had ear skin ulceration and one died out of a group of 56. The lamb had been seen with a swollen ear two days before it died. The lamb was in a poor body condition and the skin on the dorsal pinna was thickened and extensively ulcerated. The carcase fat had a slight yellow tinge and the liver was enlarged with a mottled appearance and there was an increased amount of slightly yellow peritoneal fluid. There was an increased amount of pleural fluid. Histopathology identified severe changes in the liver (Figure 15) that are likely to have resulted in hepatogenous photosensitisation and the observed skin lesions. Marked hepatic lipidosis was consistent with Ovine White Liver disease associated with low vitamin B12/cobalt deficiency intake.



Figure 15 Liver of four-month-old lamb with hepatic lipidosis and photosensitisation.

Respiratory disease

Mannheimia pneumonia

There were relatively high numbers of *Mannheimia pneumonia* diagnoses (26 cases) recorded by APHA this quarter Figure 16. *Mannheimia pneumonia* diagnoses represented 11.16% of diagnosable submissions, where diagnoses are typically between 2.03 and 8.44% of diagnosable submission during quarter 3. This represented a marked increase from the numbers recorded during this quarter last year and this number of diagnoses was only exceeded during quarter 3 in 2018.

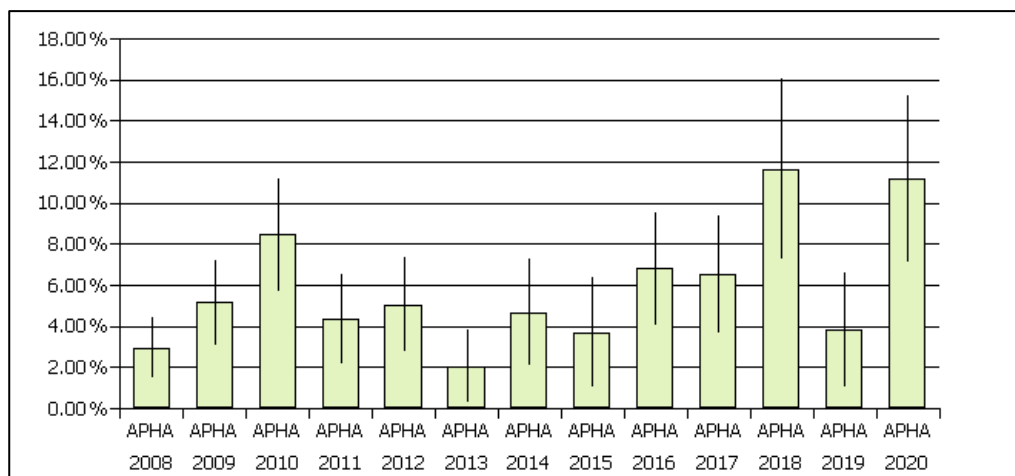


Figure 16 APHA Incidents of *Mannheimia haemolytica* as & diagnosable submissions Q3 2020

Mannheimia pneumonia diagnoses in sheep have experienced a sustained increase for the last three years, when recorded as a percentage of diagnosable submissions, as illustrated in the rolling annual seasonal data Figure 17. The reasons for these increased trends are unknown and trends will continue to be monitored.

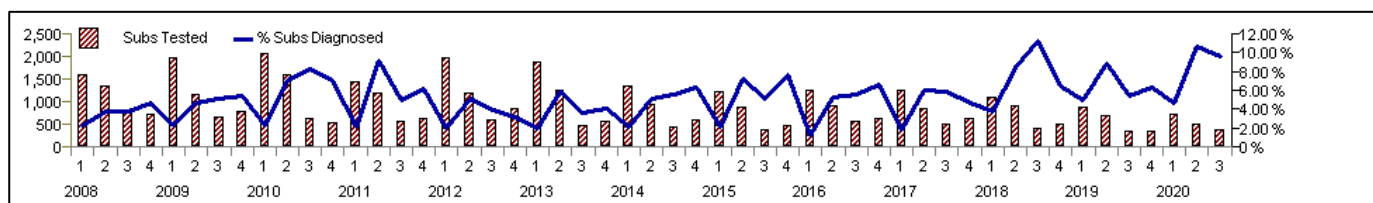


Figure 17 Incidents of *Mannheimia pneumonia* diagnosed as % diagnosable submissions in GB 2008-2020

Mixed disease issues were typical for the diagnosed cases this quarter. Only 15% of cases had just *Mannheimia pneumonia* the remainder had one or more concurrent diseases. The majority (54%) of cases had concurrent parasitic gastroenteritis, 46% had *Mycoplasma ovipneumoniae* and 19% of cases had another potentially immunosuppressive disease

issue such as cobalt deficiency, Johne's disease or tick borne fever. Most of the diagnoses (85%) were in lambs aged between 11 weeks and 6 months, the remaining 15 % (4 cases) were in Adult sheep.

***Mannheimia pneumonia*, parasitic gastroenteritis and *Mycoplasma pneumonia* in growing lambs**

PGE was the suspected trigger factor for an outbreak of *Mannheimia pneumonia* in a group of 150, 11-week-old lambs at pasture from which nine lambs had died over recent days. A typical case was submitted. Widespread pleurisy and 100% grey-pink consolidation of the cranial lungs lobes was found on post-mortem examination. Laboratory testing confirmed the involvement of *Mannheimia haemolytica*, *Mycoplasma ovipneumoniae* and *Mycoplasma arginini*. In addition, 550 trichostrongyle-type worm eggs were detected in caecal content indicating a moderate worm burden in the submitted lamb. A subsequent worm egg count of pooled faeces from the group gave a count in the 1000s confirming PGE as the likely underlying trigger factor.

Ovine pneumonia caused by *Mycoplasma ovipneumoniae*

There was a marked increase in the number of *Mycoplasma ovipneumoniae* diagnoses recorded by APHA during quarter 3 (Figure 18) . There were 19 diagnoses made this year compared to 7 during this quarter in 2019, and 13 diagnoses in 2018. *Mycoplasma ovipneumoniae* infection is typically described as causing coughing and weight loss in growing lambs, and potentially in some ewes. When there are more marked respiratory signs or death this is usually as a result of a concurrent infection such as *Mannheimia*, although occasional acute *M. ovipneumoniae* cases can be fatal. *Mycoplasma* infection may predispose sheep to more severe *Mannheimia* infection, including in some cases animals that have been *Pasteurella* vaccinated. The majority of *M. ovipneumoniae* cases this quarter had concurrent *Mannheimia* infection (63%). PGE was also diagnosed in 37% of the cases, and there were two submissions with concurrent *Listeriosis*.

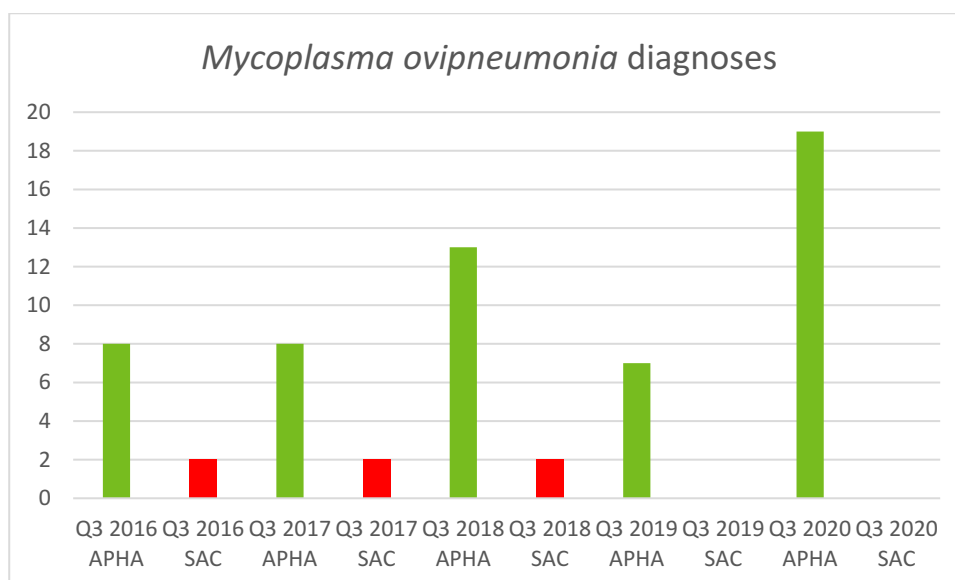


Figure 18 *Mycoplasma ovipneumoniae* diagnoses Q3 2020 APHA and SAC

Ovine Pulmonary Adenocarcinoma

SRUC recorded increased numbers of ovine pulmonary adenocarcinoma diagnoses this quarter, with 16 cases, representing 14.68% of diagnosable submissions (Figure 19). Diagnoses have represented between 1.55% and 8.89% of diagnosable submissions in previous years during this quarter.

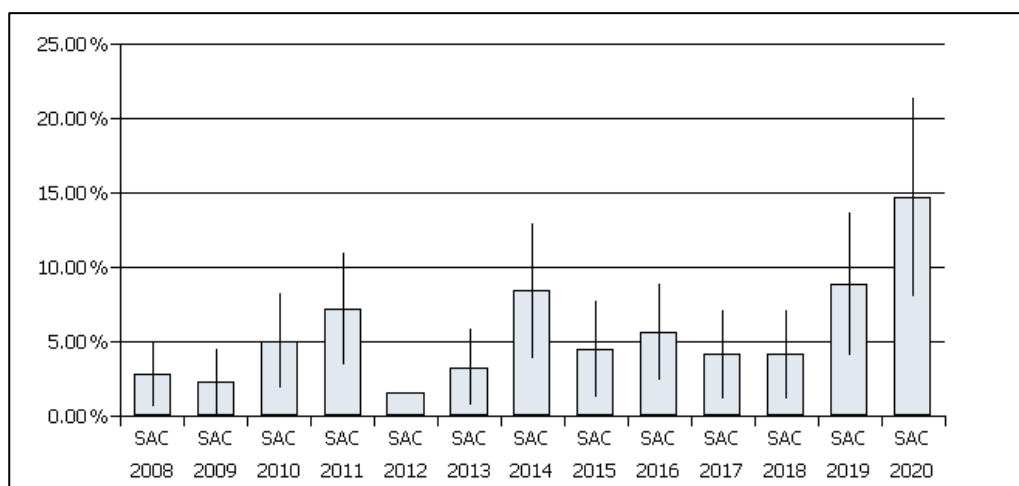


Figure 19 SAC Incidents of OPA in sheep as a % diagnosable submissions Q3 2008 - 2020

Ovine pulmonary adenocarcinoma and *Mycoplasma ovipneumoniae* in a three-month-old lamb

A 3-4-month-old lamb was submitted to investigate respiratory signs and mortality. Over a period of one month approximately seven lambs, in one group of 120-130 ewes with lambs at foot, had been affected with dyspnoea and malaise with a poor response to antibiotic

and anti-inflammatory treatment. There was lung consolidation with a ventral distribution (Figure 20) and there were distinct dense pale areas (Figure 21) within the consolidated cranial lung. *Mycoplasma ovipneumoniae* infection was confirmed and lung histopathology revealed concurrent Ovine Pulmonary Adenocarcinoma (OPA). Although OPA is relatively unusual in lambs as young as this it does occur. High levels of infection in the ewes and intensive management are particular risk factors that can encourage cases in young lambs. Inflammatory damage in lung tissue is also thought to potentially accelerate the retrovirus / tumour cell replication, therefore a concurrent *Mycoplasma* infection may have encouraged accelerated OPA lesion development in this lamb.



Figure 20 Well demarcated consolidation of the cranio-ventral lung.



Figure 21 Pale dense section of cranial lung.

Multiple pathogens involved in respiratory disease in a pedigree flock

A Blue Texel ram lamb was submitted to investigate coughing that affected the majority of a group of 120 lambs with five deaths. They had received the first “Heptavac-P” vaccination a week earlier, were wormed with a white drench and given blowfly protection. The lamb was in good body condition and postmortem findings included numerous 2mm diameter pale foci in clusters in the liver; liquid intestinal and abomasal contents; extensive pleural adhesions; consolidation of the ventral portions of the lungs; grey consolidation of the left middle lung lobe and enlarged bronchial lymph nodes. Laboratory testing identified a significant worm burden. *Listeria monocytogenes* and *Mannheimia haemolytica* were isolated from the lungs and liver, indicating systemic spread, plus *Mycoplasma ovipneumoniae* was detected by DGGE/PCR in the lungs.

Nervous disease

Cerebro-cortical necrosis (CCN)

There has been an increase of cerebro-cortical necrosis (CCN) diagnoses during the third quarter of the year with 20 (6.04%) incidents reported in 2020 compared to 15 (5.19%) in 2019 (Figure 22). Increases were seen by both APHA and SRUC.

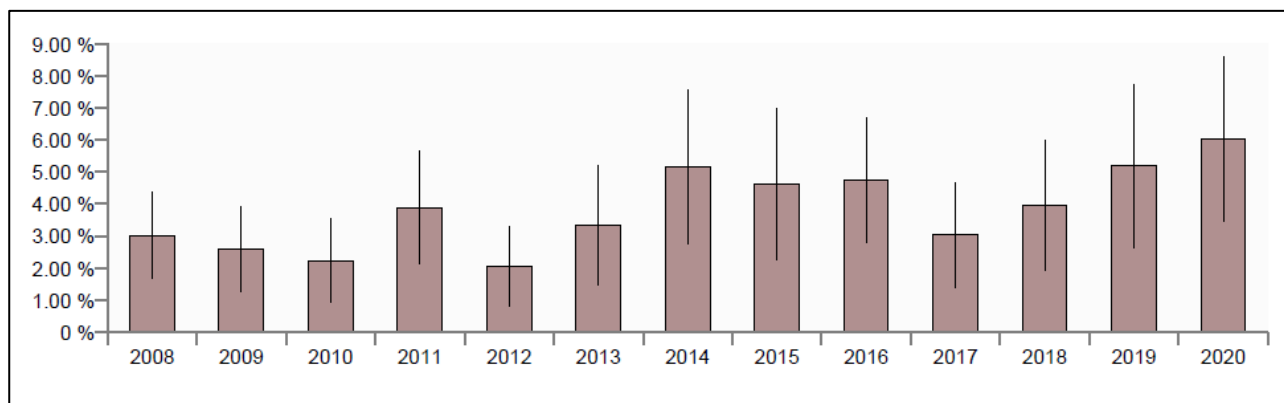


Figure 22 GB Incidents of CCN in sheep as % diagnosable submissions Q3 2008 - 2020

Urinary disease, Reproductive disease, Musculoskeletal disease, Enteric disease, Systemic disease – No significant trends were identified this Quarter.

Centre of Expertise for Extensively Managed Livestock

During Q3 2020, 200 diagnostic submissions were received from Hill/Upland sheep in GB with presenting signs of hill sheep from which samples/carcases were submitted and found dead the most common sign (Figure 23). Note that abortions are included in the adult category. The top ten VIDA diagnoses made for these are shown in Figure 24.

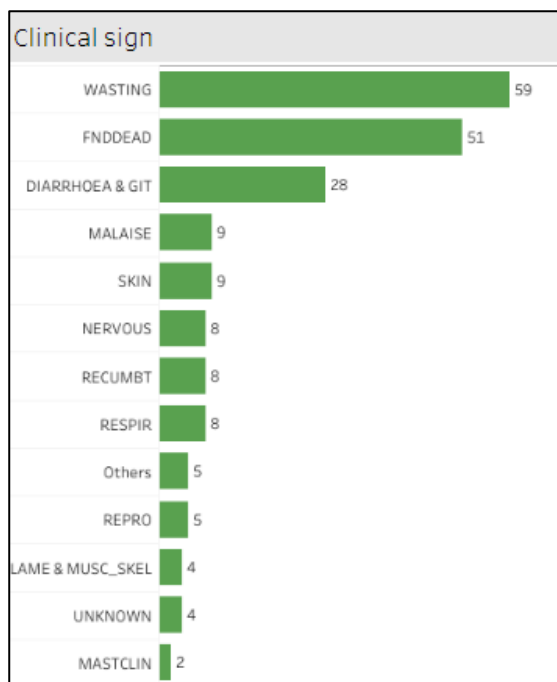


Figure 23 presenting signs of hill sheep Q3 2020

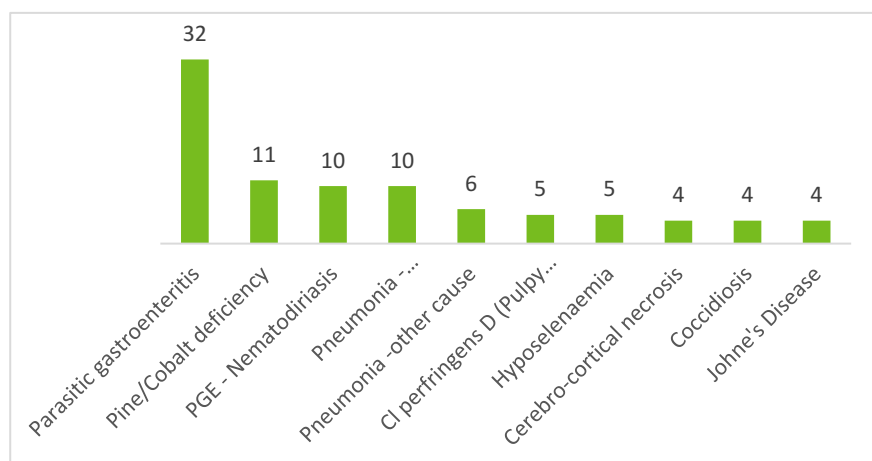


Figure 24 The top ten VIDA diagnoses Hill sheep Q3 2020

The APHA Centre of Expertise for Extensively Managed Livestock would like you invite you to a webinar on 'Tick-borne Diseases'

Wednesday 9th December 12:00 – 14:00

Tick-borne diseases such as louping ill and tick-borne fever pose a major health concern to extensively managed animals, such as cattle and sheep grazing areas of moorland. This webinar will provide an overview of tick-borne diseases in the UK with the aim of increasing awareness and providing information on the treatment and prevention of cases.

If you would like to attend please register your interest by emailing Carmarthen@apha.gov.uk – places are limited.

Horizon scanning

Bluetongue (BTV) update

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

In France, 32 new outbreaks of BTV-8 have been reported via 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 mucus membranes and abortion.

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

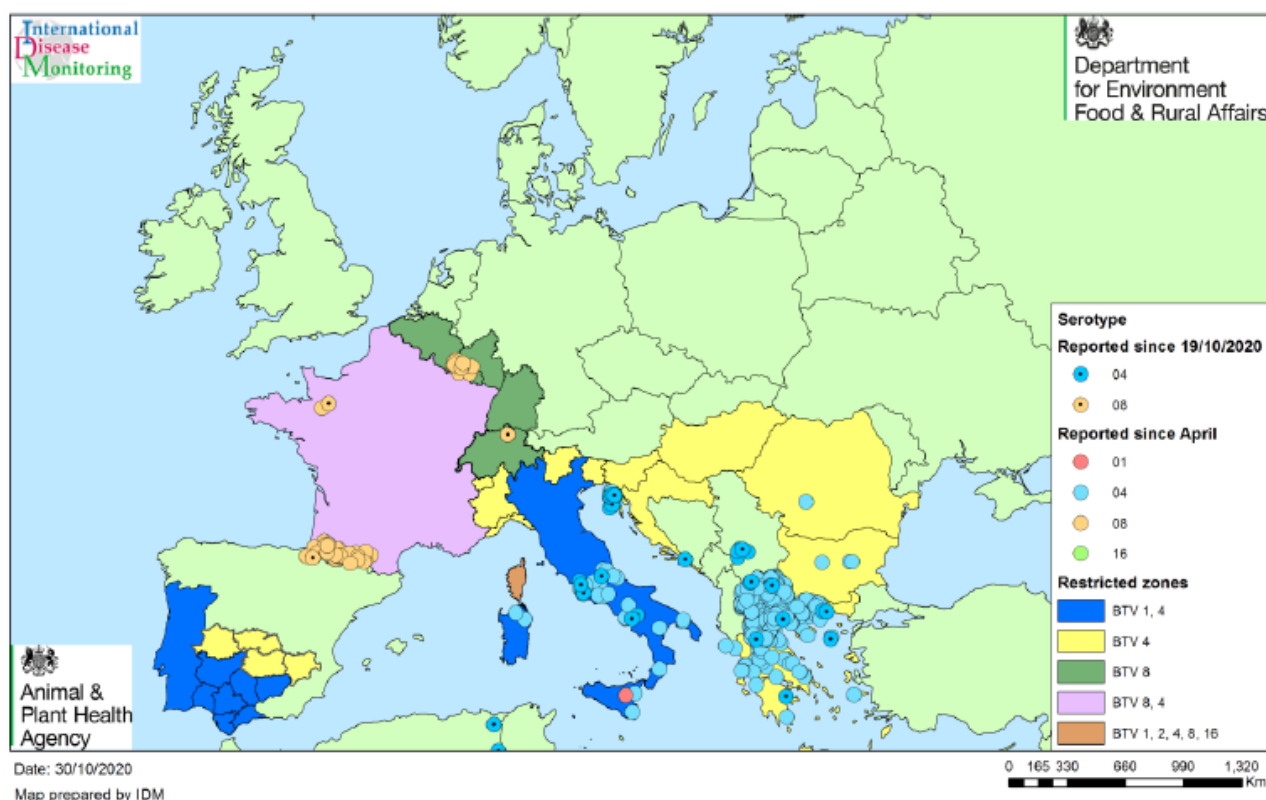
BTV-4 has continued to spread widely across South-East Europe, with several outbreaks being reported in Greece and in the Republic of North Macedonia and continued reports in Italy and Romania. In October, both Bulgaria and Croatia reported cases of BTV-4 for the first time this year.

In the Republic of North Macedonia all but one (152) of the outbreaks of BTV4 were in sheep flocks, the other being in cattle.

Greece has reported 159 new cases of BTV-4 following passive surveillance (one in cattle, three in goats and 155 in sheep) and 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 outbreaks in Europe is shown in Figure 25.



Bluetongue disease in Europe: May - October 2020

Figure 25 Bluetongue disease in Europe May - October 2020

For more information, see our Outbreak Assessment at:

<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>

Salmonella

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>

Reports of *Salmonella* from sheep in 2019 were slightly lower than during 2018 (103 isolations vs. 110 isolations) and 2017 (110 isolations) Figure 26.

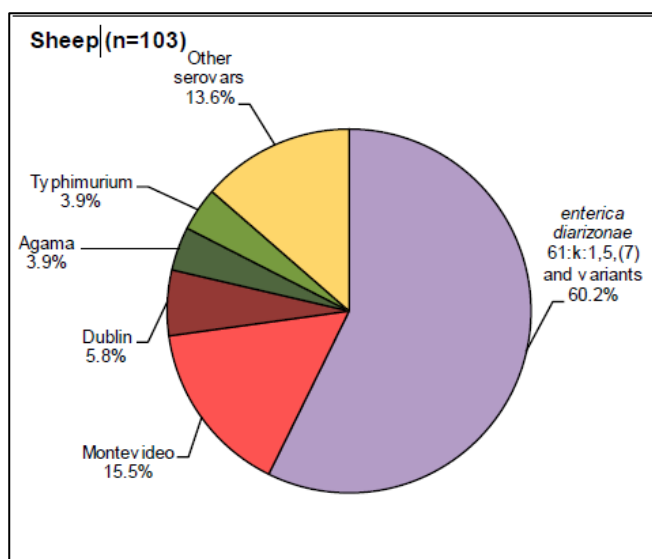


Figure 26 Isolations of most common *Salmonella* serovars

Salmonella enterica subspecies *diarizonae* serovar 61:k:1,5,(7) (and variants) remained the most common serovar (59 isolations; 60.2% of total sheep isolations).

Salmonella Montevideo was the second most commonly reported serovar from sheep during 2019 (16 isolations; 16.3% of total reports from sheep) and *S. Dublin* was the third most common (6 isolations; 6.1% of total reports from sheep).

There were four *Salmonella* Typhimurium isolations in sheep during 2019 representing 3.9% of *Salmonella* isolations. This is a considerable reduction compared to the unusually high numbers seen in 2018 (15 isolations), 2017 (16 isolations) and 2016 (11 isolations), and a return to the low number of annual *S. Typhimurium* isolations typically seen prior to this. Diarrhoea is most frequently described in diagnosed cases, often in combination with “found dead” and malaise.

There was a single isolation from goats in 2019 (*Salmonella* 16:z10:e,n,x,z15) compared with no reports during 2018 or 2017. Prior to 2019 the last report from goats in GB was in 2016 (one isolation of *S. Coeln*).

Poisoning

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 risks due to ingestion of acorns

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

Publications

APHA Staff

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