Animal & Plant Health Agency

SRUC

GB small ruminant quarterly report

Disease surveillance and emerging threats

Volume 21: Q2 – April-June 2018

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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.

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Introduction and overview

This quarterly report reviews disease trends and disease threats for the second quarter of 2018 April – June. It contains analyses carried out on disease data gathered from APHA, SRUC Veterinary Services division of Scotland's Rural College (SRUC VS) 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.

Issues & Trends

Weather

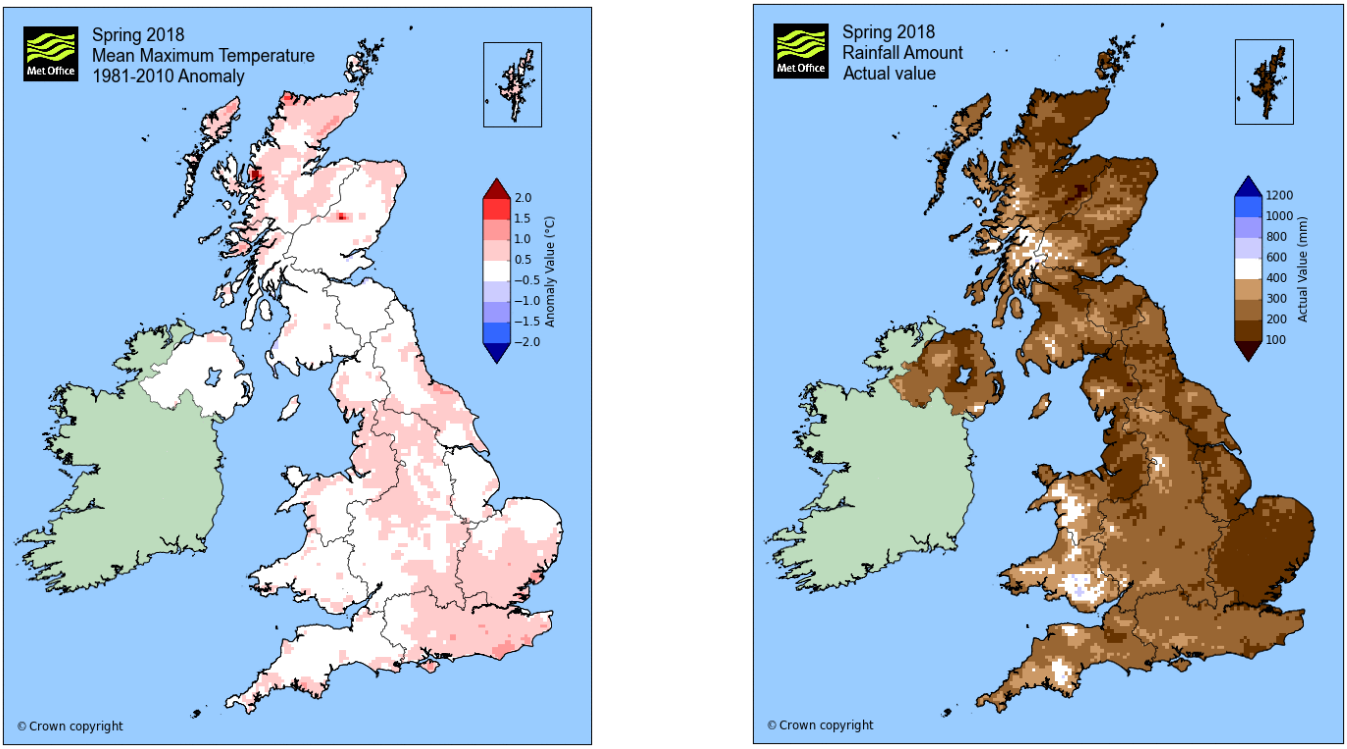

Fig 1: Spring 2018 mean temperature anomaly compared to 1981-2010 expressed as % of the average for 1981-2010 and actual rainfall amount (right)

May 2018 was one of the hottest on record, with a mean temperature of 12.1ºC, 1.7ºC above the long-term average (1981-2010 data) and rainfall was 31% below the long-term national average for May (Fig 1). Temperatures during June also rose well above average in some regions of Great Britain (GB). Below average temperatures in early spring meant a delayed start to the growing season, with many areas of GB facing drought conditions.

In June there were wildfires on the moors surrounding Greater Manchester including Saddleworth, Dobcross, Winter Hill and Horrocks Moor with over 300 firefighters joined by

100 army personnel. APHA field services reported that farmers in these areas were able to gather their sheep as the fires advanced with few reports of serious injury.

The NFU has reopened its Fodder Bank in response to the late drilling of spring crops in the east which could lead to lower straw yields and the current hot dry weather which is limiting grass growth so. This is a **free service** that helps NFU members find cattle feed and animal bedding for their farms - or lets them sell any surplus.

Forage Aid is a charity that provide forage and bedding from donations and pledges from within the farming community, then distribute it to those whose own supply of feed has been destroyed or made inaccessible due to the weather http://www.forageaid.org.uk/

APHA produced an information note on associated livestock health, welfare and production problems that may arise as a consequence of the hot weather.

http://apha.defra.gov.uk/documents/surveillance/diseases/infonote-hotweather-summer18.pdf

Industry

During April and May lambs were being sold deadweight for record breaking prices, but by the end of June prices had started to fall. Lamb retail demand has faced further pressure during the 12 weeks ending 17 June, in part due to demand shifting towards BBQ products favouring other proteins.

Clean sheep slaughterings have come under pressure, standing at 2.8 million head during the quarter which is 7% below year earlier levels, due to the reduced number of new season lambs being available. Total sheep meat production during the second quarter dropped back 10% on year earlier levels, to 64,000 tonnes. This reduction in domestic supply has limited supplies available for export, as has a reduced volume of imports. In addition, industry reports have suggested many of the animals coming forwards are under finished and lighter, putting both prices and production under pressure.

Imports have continued on the declining trend set in 2017, falling by 23% year-on-year, to 14,300 tonnes during April and May. Although an increase in global demand for sheep meat has tightened global supplies and raised global prices, UK exports have been limited by the tightening supplies available on the domestic market, and have declined by 31% on-the-year during the same period, to 9,800 tonnes.

Rebecca Oborne, AHDB Beef and Lamb.

New and re-emerging diseases and threats

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

Unusual diagnoses

Dandy Walker Malformation

A neonatal Suffolk lamb was submitted to APHA Veterinary Investigation Centre (VIC) Shrewsbury with a history of being unable to stand since birth. It was the second lamb to be affected from a flock of 100 ewes. The brain was visibly, anatomically abnormal on gross post-mortem examination. There was partial agenesis of the cerebellum, which was missing the caudal part of the cerebellar vermis. This finding was within the spectrum of change for Dandy Walker malformation which has been previously reported in the UK in both sheep (Pritchard and others 1994) and cattle (Jeffrey and others 1990). Teratogenic exposure could not be ruled out, but as there had been two cases an inherited genetic aetiology remained a possibility.

Rhombencephalic malformation

Rhombencephalic malformation was diagnosed by SRUC VS in twin lambs from a two-year-old Bluefaced Leicester cross from a flock of 140 ewes. The lambs were described as “dummy lambs” and had been euthanased shortly after birth. The farmer also reported the birth of a lamb with scoliosis and another with an enlarged head. Screening for evidence of exposure to Schmallenberg virus and border disease virus proved negative in both lambs and the dam. Neuropathological examination revealed the changes in lamb one to include extensive partial agenesis of the corpus callosum, fusion of the rostral colliculi, absence of the cerebellar vermis and reduction in size of the cerebellar hemispheres. In lamb two the cerebellar malformation included absence of the dorsal lobules of the vermis and attenuation and lateral displacement of the hemispheres. This constellation of lesions is within the spectrum of an uncommon but well recognised rhombencephalic malformation in lambs consistent with an intrinsic defect of early brain development. SRUC VS noted that the large majority of this type of rhombencephalic malformation occur as sporadic events and are not associated with a teratogenic viral insult or exposure to other teratogens; however, the presence of multiple malformation cases in the flock raised the possibility of a genetic component.

Changes in disease patterns and risk factors

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

Syndromic analysis

Most common diagnoses GB Q 2018

During Q2 2018 1781 diagnostic submissions were received in GB. The number of submissions by age shown in Fig 2 and percentage of submission type in Fig 3 where ‘Other’ includes samples not carcases.

Adult	629
Mixed	53
Neonatal	100
Post wean	71
Prewean	518
Unknown/other	410
Total	1781

Fig 2: Q2 Diagnostic submissions by age

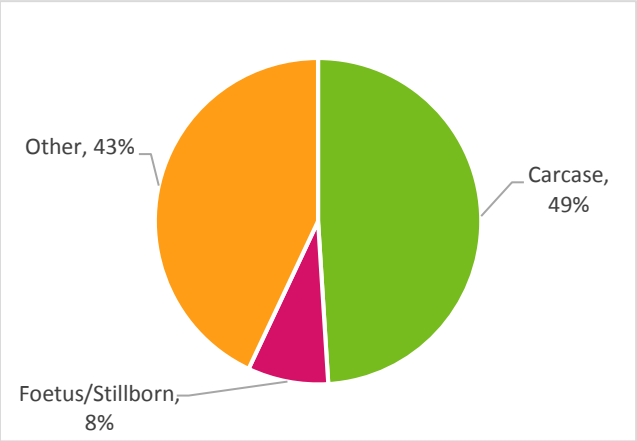

Fig 3: Q2 Diagnostic submissions % of submission type

Where a diagnosis was made the most common diagnoses during Q 2 are shown by body system in Fig 4 with diseases affecting the alimentary system (enteric) most commonly diagnosed followed by systemic diseases.

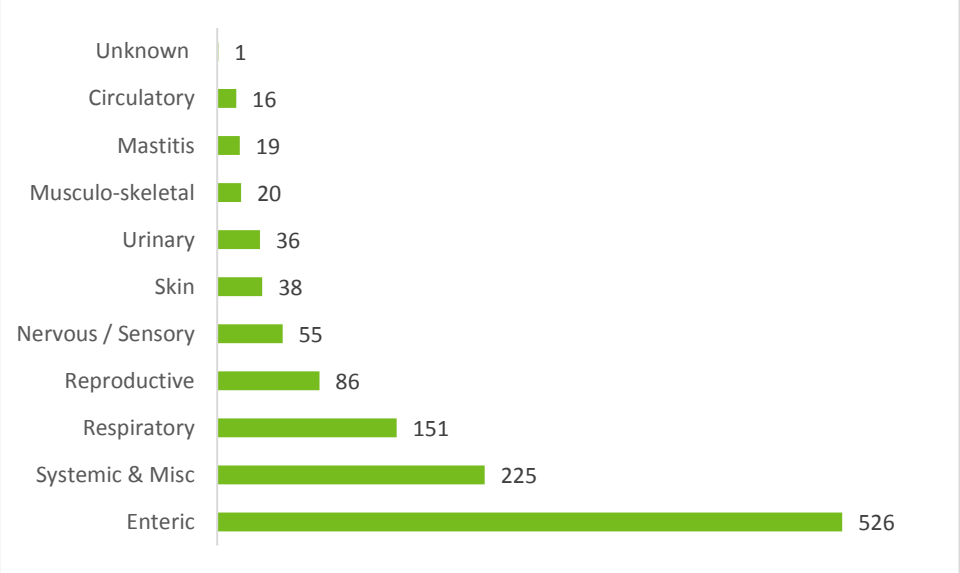

Fig 4: Q2 GB Submissions diagnosed by body system

Where a diagnosis was made under the system enteric disease during Q2 the most common diagnosis was coccidiosis Fig 5.

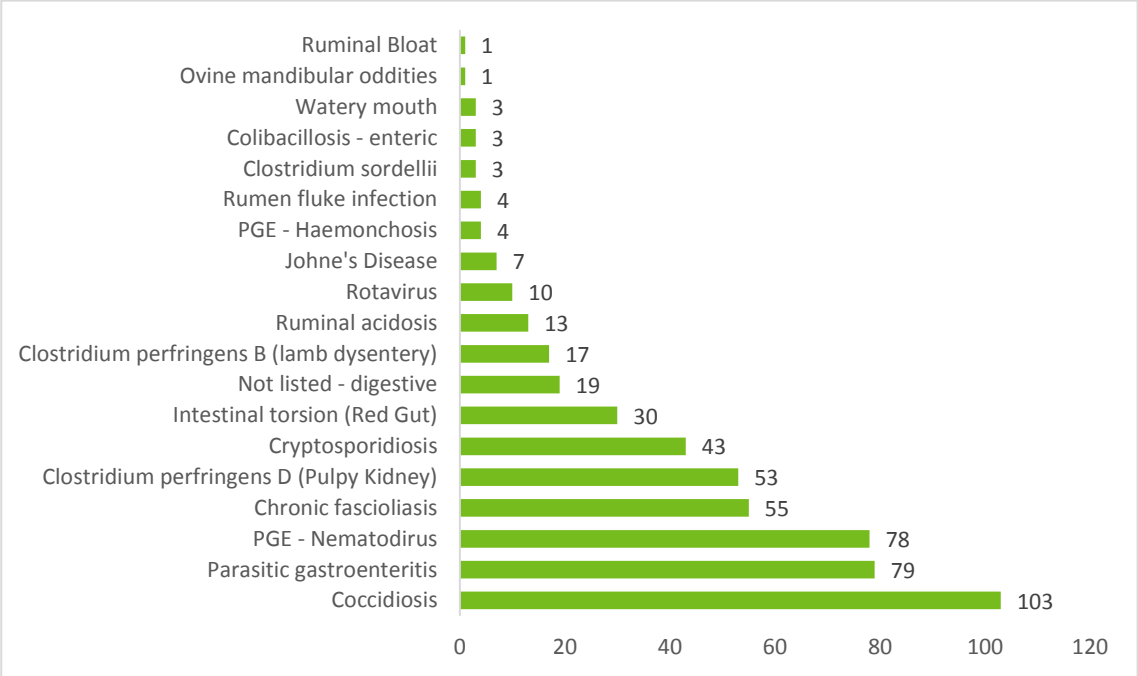

Fig 5: GB Q2 Diagnoses by system enteric

Of the 103 diagnoses of coccidiosis 62 cases were in preweaned lambs and the presenting sign of found dead was recorded in 56 cases.

See enteric section for further detail on coccidiosis.

Reproductive disease

Abortion – most common diagnoses 2018

There were 1213 submissions with the presenting sign abortion of which 69% were fetuses and 31% other which include samples collected by vets comprising fetal stomach contents, fetal fluids, viscera and placenta. Where a diagnosis was made a count of diagnoses is shown in fig 6.

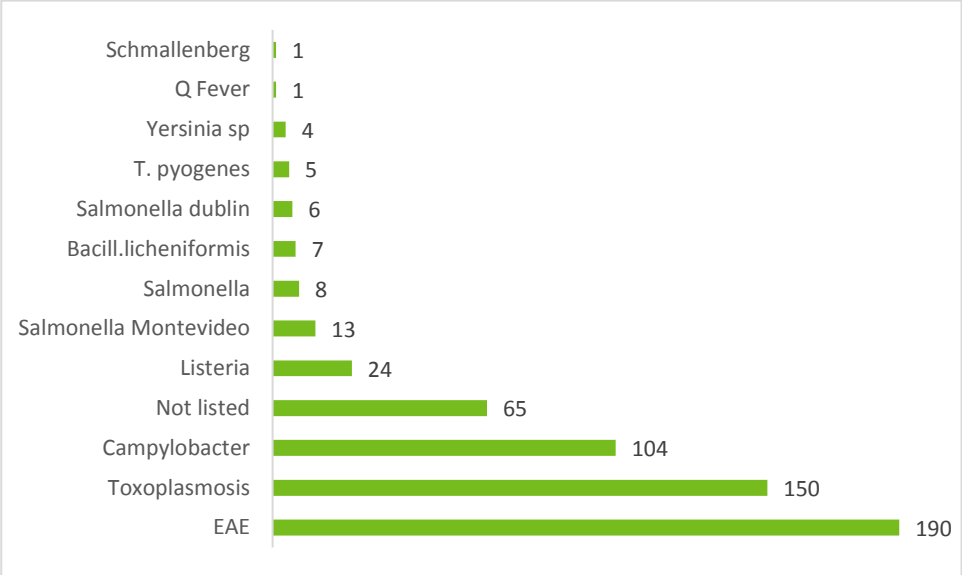

Fig 6: Count of GB diagnoses of abortion Q1 and Q2 2018

Unsurprisingly Enzootic Abortion of Ewes (EAE) (190 cases) caused by *Chlamydia abortus* remains the most commonly diagnosed cause of abortion followed by Toxoplasma (150 cases) and *Campylobacter sp* (104 cases).
In July, private veterinary surgeons in England and Wales were provided with details of their client's flocks from which EAE and toxoplasma had been diagnosed. This reminder helps inform flock health planning, and discussion of vaccination and biosecurity, to prevent these diseases in future lambing seasons. In Scotland vets were also offered a summary report on request.

Schmallenberg virus (SBV) first identified in 2011, made a resurgence during the lambing season of 2017 with four confirmed cases in deformed lambs identified in the south west of England during December 2016. The number of confirmed cases of SBV 2012 – 2018 is shown in Fig 7.

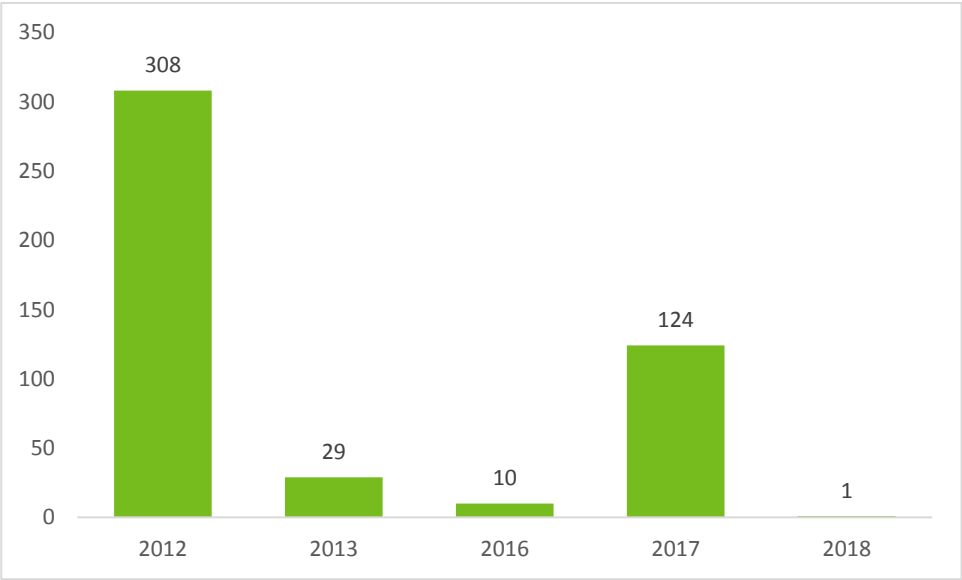

Fig 7: Count of diagnoses of Fetopathy due to SBV in GB 2012 - 2018

ProMED posts in February and March 2018 reported an increasing number of SBV cases in Ireland and Northern Ireland with most counties reporting cases. This was summarised the AFBI Surveillance report in the Vet Record (2018). Conversely during 2018 only one fetus submitted to APHA VICs, SRUC Veterinary Services Disease Surveillance Centres and APHA contracted partner post mortem providers, was positive by PCR for Schmallenberg virus. This may be due to farmers not wishing to submit fetuses for examination or assumptions being made that a fetus with a deformity was caused by SBV.

SBV is still a relatively newly characterised virus. Related viruses for example Akabane have shown that epizootics tend to only occur at intervals, coinciding with a decrease in population immunity to the virus (Regge 2016). This is supported by the study carried out by Stokes where no clear indications were found for SBV circulation in the south of England in 2015 (Stokes and others 2016). There is always the potential for new strains of this virus to emerge with differing pathogenicity and farmers and vets should take advantage of the investigatory services offered by APHA and SRUC VS in unusual presentations or incidents of high morbidity/mortality in livestock.

Parasitology

Chronic Liver Fluke

The trend in the increase in incidents of chronic liver fluke, though not statistically significant, seen in Q1 2018 continued into Q2 2018 with 58 cases reported in GB compared to 37 in the same quarter in 2017 (Fig 8). Towards the end of lambing liver fluke probably contributed to ewes presenting in poor condition compounded by periods of adverse winter weather and sub optimal forage quality.

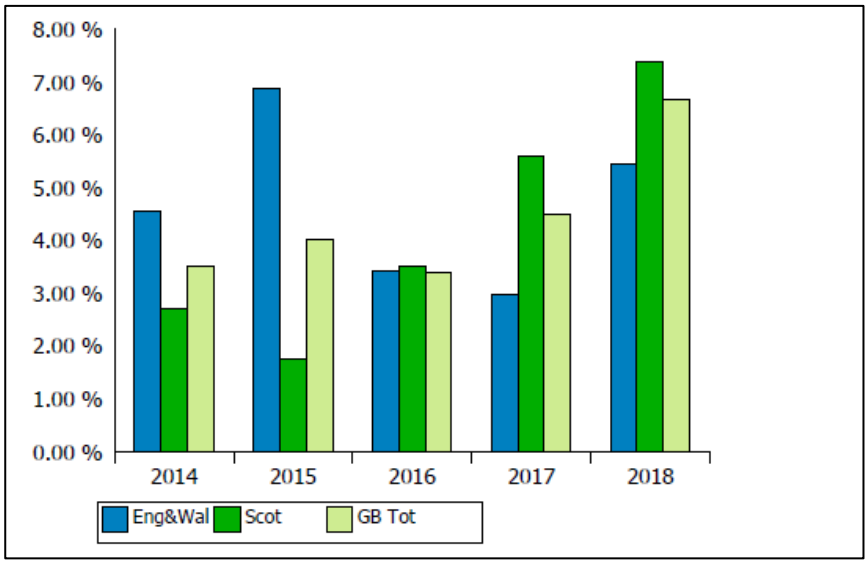

Fig 8: GB Incidents of Chronic Fasciolosis in Sheep as % of diagnosable submissions in Q2 2018

Enteric disease

Coccidiosis is a disease caused by a protozoan parasite that infects cells lining the intestines of lambs.
The majority of those that infect sheep do little damage, but *Eimeria crandallis* and *E. ovinoidalis* can cause disease if:

- Infected lambs do not have adequate feed.
- Infected lambs are affected by cold or wet weather.
- Lambs have other infections e.g. Nematodirosis.

A comparison of the most common diagnoses of enteric diseases as a % of diagnosable submissions Q2 2018 and average of Q2 2013 – 2017 is shown in Fig 9.

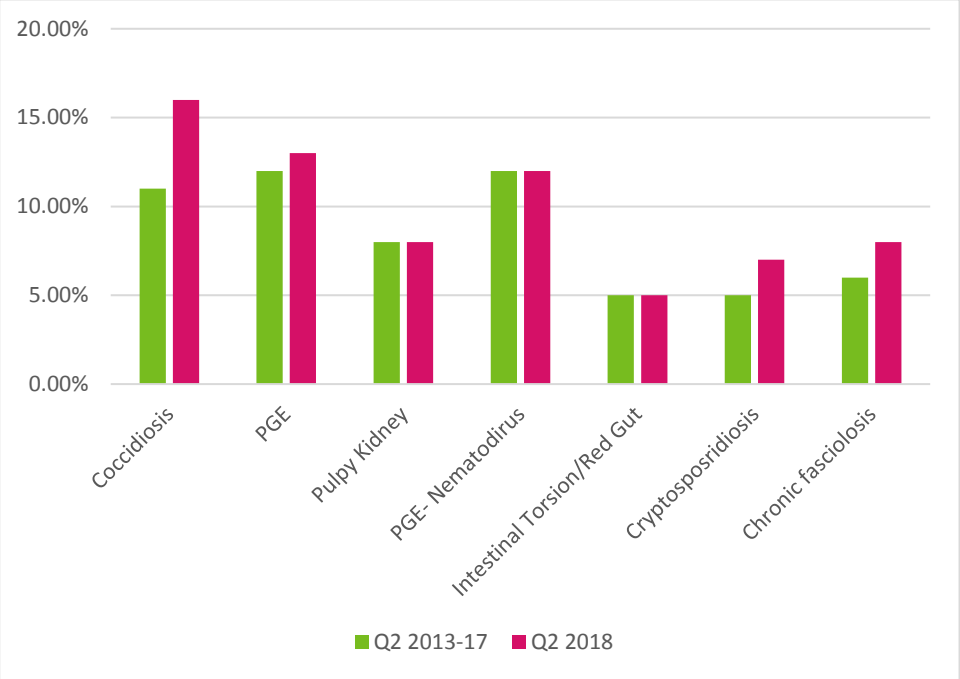

Fig 9: Most common diagnoses of enteric diseases as % of diagnosable submissions Q2 2018 and average of Q2 2013 – 2017

The cold spring, resulting in slow grass growth, plus inadequate ewe milk yields (secondary to poor body condition) may have predisposed to the increase number of cryptosporidium and coccidiosis cases in lambs. The drier conditions later in the second quarter leading to more congregation around drinking troughs and build up in the surrounding mud/soil and the resultant shorter grass may have led to a higher level of soil being ingested with a resultant higher level of exposure to coccidial oocysts. For these reasons it is anticipated that coccidiosis will continue to be at a high level for the third quarter too.

Respiratory disease

There were increased numbers of several different diagnoses of pneumonia this quarter: There was an increase in diagnoses of *Mannheimia* pneumonia for both SAC and APHA (GB), with the highest number of cases recorded since 2011, at 8.57% of diagnosable. Diagnoses for this quarter typically range from 3.72% to 9.15% of diagnosable submissions.

There seemed to be a greater number of cases of parasitic pneumonia in adult sheep (Fig 10) this quarter contributing to this increase in diagnoses. Although adult sheep can become clinically infected with lungworm, when there is heavy pasture challenge or if exposed sheep have no prior exposure immunity, cases this early in the season in an established flock are more likely due to poor immunity resulting from poor nutrition or concurrent disease issues.

In five of the cases described in adult sheep, the ewes were in a poor body condition with a concurrent heavy gastrointestinal worm burden. A concurrent bacterial pneumonia was contributing to signs in four of these cases. In one case 5 out of a group of 32 ewes had died.

Fig 10: Dictyocaulus filaria lungworms in the airways.

Inhalation pneumonia in Swaledale lambs

Necrotising bronchiolitis and interstitial pneumonia characteristic of inhalation of an irritant were found in two three-week-old Swaledale lambs submitted to APHA Penrith VIC for post-mortem examination (PME) following four unexpected deaths. Four lambs from a group of 90 were found dead three days after management interventions which included ear notch tagging, administering an albendazole worm drench, an oral copper-containing multivitamin, and application of a topical insecticide. Two lambs were submitted for PME. Both lambs had severe pneumonia with dark red consolidation affecting all of the lung lobes. On histopathological examination of both lambs' lungs there was a necrotising

bronchiolitis with further airways showing signs of an aerogenous insult. There was also a diffuse interstitial pneumonia which was considered secondary to the inhalation, as the alveoli were not the primary target in this case. Although there is no validated reference range for copper levels in ovine lung, biochemical assessment of the copper levels in these two lambs' lungs was performed because APHA has occasionally observed these lung changes in previous cases where the inhalation of copper compounds has been implicated as the irritant. The lung copper levels were 221 and 502 µmol/kg DM which were higher than expected (Abdelbasset and others 2014). It was concluded the pathological lung changes in these lambs may be due to the local effect of copper. However, other compounds in the orally administrated products could also act as irritants if inadvertently inhaled.

Multiple deaths in lambs after management tasks is occasionally reported. Hot days and stressed animals can result in increased susceptibility to inadvertent inhalation of oral products. These incidents highlight the need for care when performing multi-management tasks - in particular in any animals that appear to struggle or resent handling. In this case it was also advised to check that drenching equipment is working optimally so that 'nothing is sticking' which, with excess force to get working, could result in a large volume of drench being ejected at speed into an animal's oral cavity leading to inhalation of some of the drench.

***Mycobacterium bovis* spoligotype 17 infection** was confirmed in a nine-year-old pet pygmy goat which had a history of chronic respiratory disease. A cough had first been noticed a year before euthanasia and it had shown progressive loss of condition, respiratory distress and harsh lung sounds. Multiple abscesses were present in the lungs, spleen, lymph nodes, adjacent to the kidneys and a large area of abscessation with multiple gritty lesions was present in the area of the ethmoid bones.

Nervous disease

Listerial encephalitis

There was a statistically significant increase in the diagnoses of Listerial encephalitis this quarter (Fig 11). A total of 27 (3.14%) incidents were recorded compared to 9 (1.06%) in 2017. Increases were seen by both APHA and SRUC VS. The majority of cases were in adult animals from Lowland flocks. The possibility of increased cases of this condition was anticipated by the Small Ruminant Expert Group in the Q1 report due to the adverse weather conditions during the spring. This led to prolonged feeding of adult animals, often with poorer quality forage. Furthermore, the risk of soil ingestion was increased due to the subsequent poor spring grass growth and if supplementary concentrate was being fed directly from pasture.

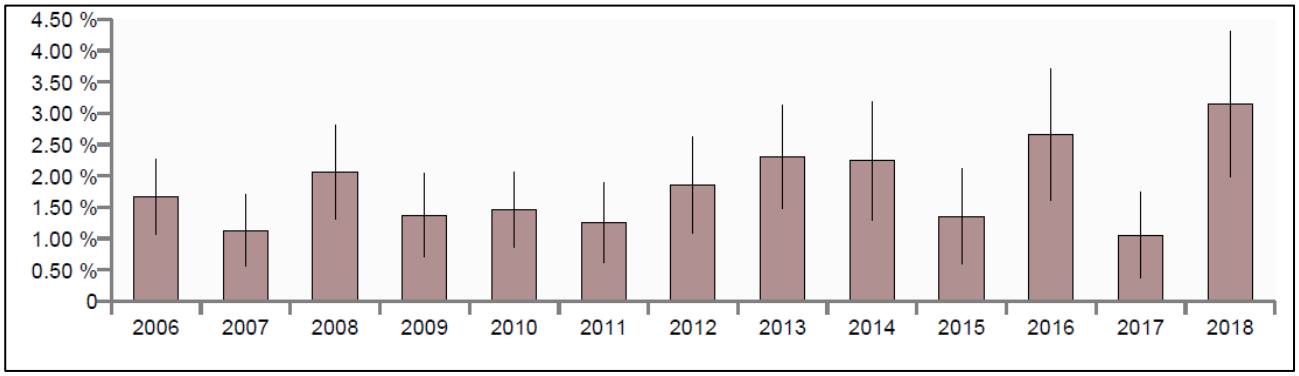

Fig 11: GB incidents of Encephalitis listeria in Sheep as % of diagnosable submissions Q2 2018

Louping ill

There have been no diagnoses of Louping ill this quarter, with no cases reported by either APHA or SRUC VS. Since tick activity is highly influenced by climatic conditions the hot, dry early summer period is likely to have limited tick host-seeking behaviour. However, a study on the seasonal activity of *Ixodes ricinus* by Gray (Gray 2008)suggests that with high summer temperatures (average air temperatures 30°C) much of the host-seeking activity of nymph and adult *I. ricinus* occurs in the late autumn and in the early spring of the following year. Therefore, although difficult to accurately predict it is possible there may be a flurry of tick borne disease, including louping ill during the coming months.

Skin

Sheep Scab

A report on the free ectoparasite testing in Wales has been published on the Centre of Extensively Managed Livestock page of the Vet Gateway: http://apha.defra.gov.uk/documents/surveillance/diseases/ectoparasite-report-1217-0318.pdf . This initiative was suggested and funded by the Welsh Government. Its aims were to support accurate diagnosis of pruritic sheep and to promote correct treatment.
The project was launched in December 2017 and promoted by information to farmers and veterinary surgeons through APHA newsletters, social media and farming industry bodies.
The first samples were received on 20.12.17. The last samples were received on 03.04.18 (but were posted in March).
The skin scrape and/or wool samples were submitted in the usual way via the veterinary surgeon with submitter and animal details then examined following APHA standard operating procedures.

There was a good uptake in this free testing initiative, which resulted in 164 submissions.

Sheep scab due to *Psoroptes ovis*	78 (47.6%)
Ectoparasitic disease due to lice	35 (21.3%)

Number of submissions diagnosed with both *Psoroptes ovis* and lice	8 (4.9%)
No ectoparasites detected	43 (26.2%)
Total submissions	164

Ectoparasites were detected in 121 (73.8%) submissions. No other tests were carried out for other potential skin pathogens (e.g. *Dermatophilus congolensis*, ringworm)
147 different holdings submitted samples to this project. Of these 20 (13.6%) had not previously submitted samples to APHA.
16 submissions (9.8%) had findings and a history of previous macrocyclic lactone (ML) treatment that raised strong suspicions of inefficacy. i.e. live mites detected post ML treatment and little resolution of clinical signs. Other submissions where *P. ovis* mites were only detected on a KOH digest post treatment could have indicated inefficacy, but as there is no information on how long dead mites may remain in a fleece, these were not counted as such.

In the same period the previous year there were 25 submissions from sheep holdings in Wales to APHA for ectoparasite examination. This free initiative resulted in over a 500% rise in submissions.

As expected, with the conclusion of this project the number of submission from sheep holdings in Wales tested by APHA for ectoparasite examination has significantly decreased compared to the previous quarter. Precisely, in the second quarter of the 2018, 22 submissions from sheep holding in Wales were analysed for ectoparasites and in nine occasions *P. ovis* mites were detected.

Orf

A severe outbreak of **parapoxvirus virus (orf)** was diagnosed in an orf vaccinated lowland sheep flock in Wales. Two lambs had died and 50 out of 200 lambs were affected with skin lesions predominantly on the ears (Fig 12). Foot proliferative lesions were also reported in four lambs (morbidity 25%) (Fig 13). In 2017 similar foot lesions had been observed in pet lambs. The vaccination against orf began 3-4 years previously. Post-mortem examination (PME) of a typically affected four-month-old lamb revealed the presence of hair loss and proliferative lesions at PME, there were typical proliferative lesions on the muzzle, lips, forehead, ears and a red lesion at the coronary band of one hind limb. The diagnosis of orf was made using electron microscopy on the skin tissue collected from the lesions seen, which confirmed the presence of parapoxvirus. Orf virus typically gains entry where the skin is traumatised such as the lips in suckling lambs. It typically occurs in two peaks, one shortly after lambing and a second at three-four months of age. In this outbreak the presence of numerous sheep with primarily ear lesions suggests that abrasions had occurred to the ears. In the absence of thistles, abrasions from unfenced hedges of the lightly haired ears of these sheep may have been a possible cause. It was recommended the vaccination procedures were reviewed, and that this was reported as an adverse event (possible lack of efficacy) to the Veterinary Medicines

Directorate.

Fig 12: Orf (Parapoxvirus) head of a lamb.

Fig 13: Coronary band lesion due to orf

Systemic disease

Malnutrition

Several Veterinary Investigation Centres carried out investigations into cases of ill thrift and death in flocks where multiple ewes were affected. Significant worm burdens were detected in many cases but underlying malnutrition due to poor grazing conditions was suspected to be the primary problem. Poor ewe body condition impacted lamb survival in many flocks with several submissions of lambs where starvation due to insufficient milk intake was the likely cause of death.

Border disease and BVD in sheep

A herd of 70 cattle on a mixed sheep and beef farm recently joined a cattle health scheme and seven calves persistently-infected with Bovine Viral Diarrhoea (BVD) virus were identified.

Subsequently at lambing time on the same farm there were some early abortions and several small lambs were born alive which had undershot lower jaws. As post mortem material was not available, blood samples from these lambs and their dams were submitted to investigate potential causes of the congenital deformities in the lambs including Border Disease Virus (BDV) and Schmallenberg virus (SBV).

The dams were found to be serologically negative on the ELISA test for SBV, but seropositive on the ELISA for BDV. However, PCR testing for BDV proved negative. Serological testing was not undertaken on the lambs as they had consumed colostrum, but two lambs tested positive on PCR testing for BVD type I, suggesting they were persistently infected (PI) with BVD type 1 virus. This is not the first time that BVD virus has been

identified in sheep by APHA, but the usual presentation is more typical of pestivirus infection with “hairy shaker” lambs born.

The question arose as to whether BVD or BDV was the primary problem as both viruses appeared to be present on the farm. Sheep can be naturally infected not only with BDV, but also with BVD virus (BVDV) types I and II. Viral transmission of BDV from sheep to cattle has been reported (Braun and others 2014), as has transmission of BVDV from cattle to sheep (Carlsson 1991). A survey in 1997 of pestivirus isolates from sheep from Britain, New Zealand and Sweden over an 18-year period showed that 70 per cent of the isolates were BDV and 30 per cent were BVDV types I or II (Vilcek and others 1997). Another survey by the Moredun Institute in 2006, of mostly Scottish pestivirus isolates from sheep, confirmed that 80 per cent were BDV and 20 per cent were BVDV type I (SAC, personal communication).

The antigenic similarity of bovine and ovine pestiviruses may be problematic in demonstrating freedom from BVD by serology in the cattle population. This will have increasing importance as the UK progresses towards BVD freedom in cattle over the coming years (Russell 2018). Border disease PI cattle are occasionally identified although the risk of spread of BDV from sheep to cattle is thought to be less than BVDV from cattle to sheep. BDV does not spread within cattle herds to any great extent (APHA, personal communication).

Further investigation was advised for this holding, particularly to identify viraemic BDV or BVD PI lambs so that they will not be used for breeding or trading purposes. However, in many instances PI lambs are thought more likely to succumb to common lamb diseases such as parasitic gastroenteritis and pneumonia during their first year. It was also suggested that if replacement ewe lambs are retained for breeding they should be screened for BDV antigen before tupping this year, and if positive removed. In addition it was advised that the sheep and cattle do not co-graze. Further genotyping investigations in collaboration with the Moredun Research Institute is ongoing.

Metabolic disease

Selenium deficiency in goats

The University of Bristol Farm Animal Postmortem Services diagnosed white muscle disease in a herd of Boer cross meat goats. There had been seven deaths in kids aged between one and two weeks of age. The kids displayed respiratory signs and weakness in the front legs before dying within 24 hours of onset of clinical signs. Two kids responded to treatment with oxytetracyline (suggesting secondary infections contributing), but treatment of the others was unsuccessful. A recent faecal worm egg count had been undertaken and showed negligible worm burdens; nevertheless the does were wormed with fenbendazole. No vaccination had been practised in the herd, which had been grazing a paddock not previously grazed for 5 years.

The most striking findings at post mortem examination included marked ascites and several large areas of white discolouration on the epicardium which extended into the myocardium. The apex of the heart was thin walled and there was extensive white streaking on the left and right endocardium, extending into the myocardium (Fig 14). Subsequent blood samples of one kid revealed a GSH-PX level of 16 U/ml RBC (reference interval >60 U/ml RBC).

Fig 14: White streaking on left ventricular endocardium of a goat kid, caused by white muscle disease

Selenium/vitamin E deficiency produces a degenerative myopathy particularly in kids born to deficient dams. Vitamin E requirements of goats may be higher than those of sheep. Selenium deficient pastures, or where animal feed is produced from selenium deficient land, are the most common causes of deficiency. Kids are affected at birth, but signs are generally seen between 2 and 16 weeks of age with the most active kids affected first. The skeletal muscle form produces stiffness with kids lying down frequently, are reluctant to move, or crying out if forced to move. The cardiac form results in sudden death. Severely deficient does may produce stillborn or weak kids that die from acute heart failure.

It was recommended that the herd receive selenium supplementation either by slow release boluses 4 – 8 weeks before kidding, or oral drenching with 5mg sodium selenite during the last week of pregnancy. Dietary concentrations of 0.1mg/kg dry matter for selenium and 30 – 50 mg/dry matter for vitamin E are recommended. Affected kids should be treated with 34-68mg vitamin E and 0.75-1.5 mg selenium injected subcutaneously. This case illustrates the value of a thorough veterinary investigation, including post-mortem examination, in order to ensure appropriate and timely treatment.

Musculoskeletal disease, Urinary disease

No trends identified.

Poisoning

The Chemical Food Safety quarterly report April to June 2018 has been published:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/732614/pub-chemfood0418.pdf

Three incidents of lead poisoning in sheep and 1 incident of copper toxicity were reported.

Risk management measures for lead incidents involve:-

1. Removal of animals from the source of lead.

2. The implementation of a sixteen week voluntary withdrawal. Should emergency slaughter of any of the clinically unaffected cattle in the exposed group be required during the restriction period then the animal should be accompanied by food chain information stating that offal should be discarded.

3. Further blood sampling for blood lead analysis. This is used as a biomarker of internal (carcase) lead residues.

Potential plant poisonings and inadvertent toxicities were highlighted in the Information note on Hot Weather

Centre of Expertise for Extensively Managed Livestock

During Q2, 354 diagnostic submissions were received where the purpose included Hill sheep. These submission came from the regions shown in Fig 15, counties most likely to be considered as hill regions – Scotland, the north of England, Wales and the south west with Fig 16 showing the sheep population density.

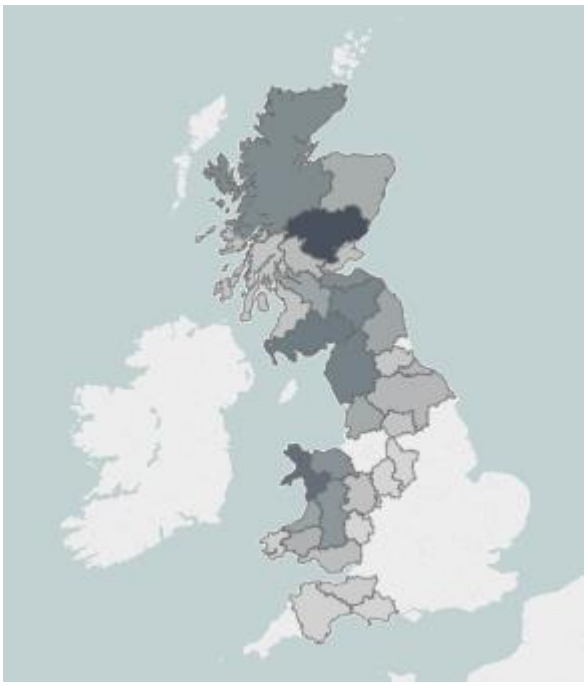

Fig 15: Submissions received from Hill Sheep Q2

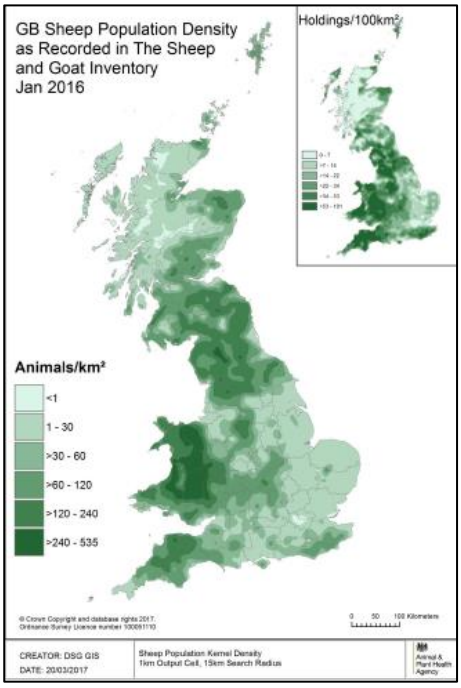

Fig 16: Population density of sheep in GB

Where a diagnosis was made – the top ten most common diagnoses are shown in Fig 17

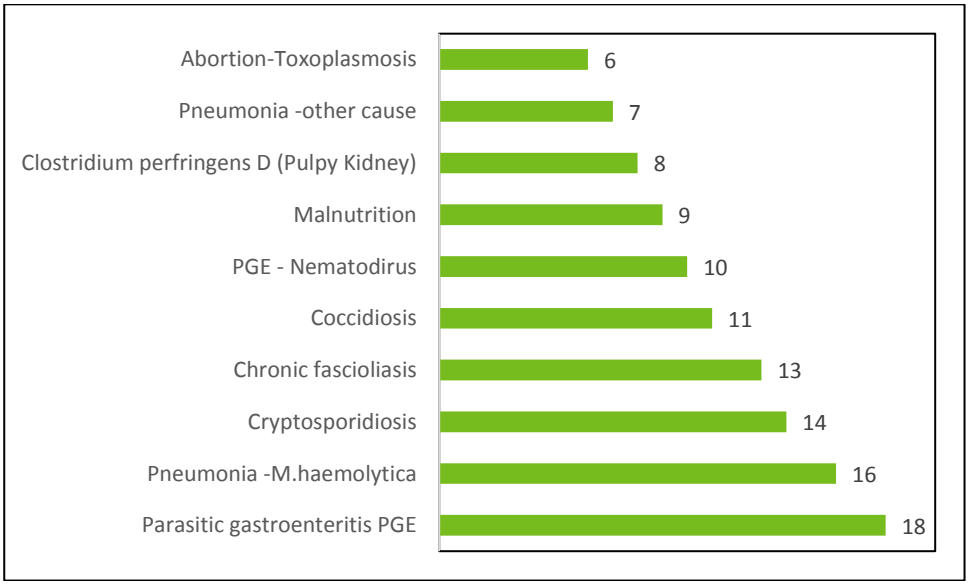

Fig 17: Count of most common diagnoses in Hill Sheep GB Q2 2018

A report on the free ectoparasite testing in Wales has been published on the Centre of Extensively Managed Livestock page of the Vet Gateway http://apha.defra.gov.uk/documents/surveillance/diseases/ectoparasite-report-1217-0318.pdf

For a summary see section on skin disease

Horizon scanning

Peste des Petits Ruminants (PPR), also known as sheep and goat plague, is a highly contagious animal disease affecting small ruminants. Once introduced, the virus can infect up to 90 percent of an animal herd, and the disease kills anywhere from 30 to 70 percent of infected animals.

FAO and the World Organisation for Animal Health (OIE) are mobilizing the international community around a new global initiative: the fight to eradicate PPR by 2030.
http://www.fao.org/ppr/en

Five new outbreaks of PPR have been reported in Bulgaria. Only mild clinical signs were observed, such as nasal discharge, raised temperatures and bloody discharge from the anus and mouth lesions. These animals have tested positive by PCR and negative on serology suggesting these are recent incursions. While PPR has been reported in Turkey this is the first report of PPR from a European country.

A risk assessment was produced by APHA in June
https://www.gov.uk/government/publications/peste-de-petits-ruminants-ppr-in-sheep-in-bulgaria

Prevention and control measures are essential for the containment of PPR. These measures may include animal movement control, culling, institution of quarantine on affected or suspect farms, and medical prophylaxis (vaccination around field outbreaks and in high risk areas).

Paul Duff (Veterinary Lead, Wildlife Expert Group) visited Mongolia this year as part of an ongoing investigation into the deaths in Saiga antelopes. Since 2016, the introduction of PPR, probably from China, into sheep and goats and subsequent spill-over has caused an estimated 85% reduction from the estimated Mongolian population of 22,000 Saiga, resulting in a remnant population of 3300 of Saiga currently present in 2018. This highlights the risk of the virus in wildlife populations.

Bluetongue

No reports from France, Italy has reported a few cases which indicates that the transmission season has started, which is usually around August / September. Other countries at risk, if disease had been circulating at high levels in France, include Netherlands, Belgium and Germany however these countries have not reported any cases therefore we conclude there is not high virus circulation in France at present. The whole of mainland France remains a restriction zone for BTV-8 and BTV-4; Italy has reported BTV-1 and BTV-4; Switzerland has a BTV-8 zone across the whole country. Restriction zones are shown in Fig 18 by BTV strain in Europe.

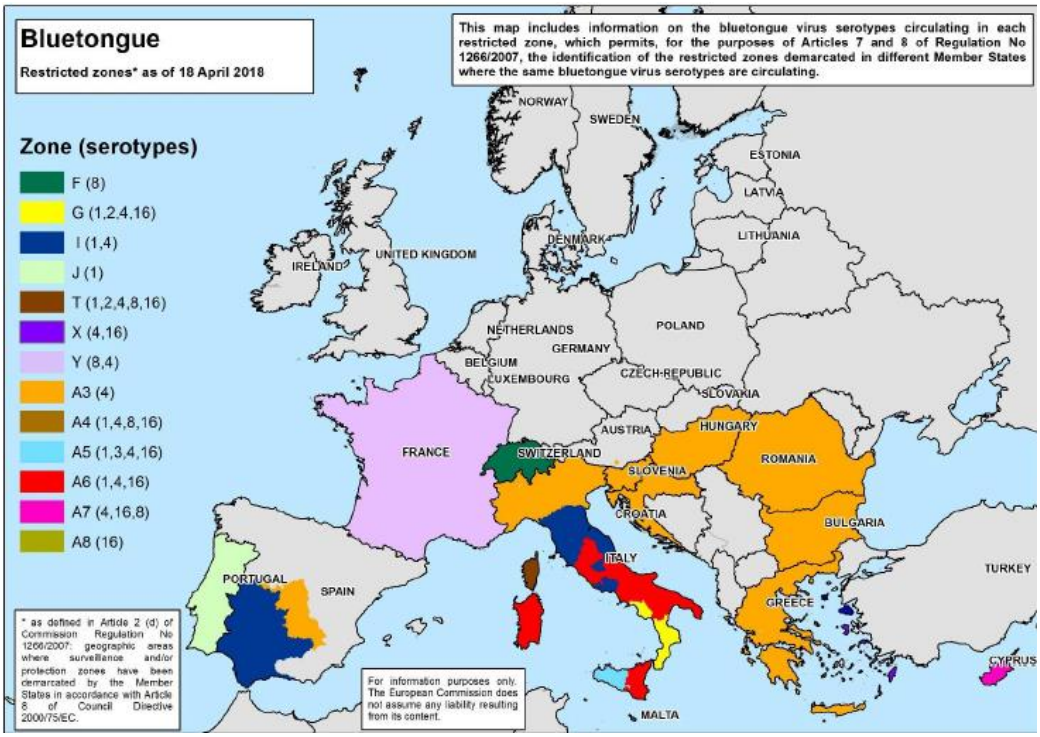

Fig 18 Restriction zones by BTV strain in Europe

Scrapie monitoring

The latest statistics on the active and passive surveillance of transmissible spongiform encephalopathies (TSEs) in sheep in Great Britain were published on 10th July 2018. The last cases of classical scrapie in sheep were recorded in 2015.

Statistics on the active and passive surveillance of transmissible spongiform encephalopathies (TSEs) in sheep in Great Britain.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/724000/pub-tse-stats-sheep.pdf

Statistics on the active and passive surveillance of transmissible spongiform encephalopathies (TSE) in goats in Great Britain.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/723904/pub-tse-stats-goats.pdf

Collated summary statistics on the number of cases of TSE disease found through active and passive disease surveillance including summary statistics on the number of submissions tested and cases found from through the Compulsory Scrapie Flocks Scheme.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/723918/pub-tse-stats-active.pdf

There have been no cases of classical scrapie in sheep since 2015.

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Annexe

VIDA diagnoses are recorded on the APHA FarmFile database and SRUC Veterinary Services LIMS database and comply with agreed diagnostic criteria against which regular validations and audits are undertaken.

The investigational expertise and comprehensive diagnostic laboratory facilities of both APHA and SRUC Veterinary Services are widely acknowledged, and unusual disease problems tend to be referred to either. However recognised conditions where there is either no diagnostic test, or for which a clinical diagnosis offers sufficient specificity to negate the need for laboratory investigation, are unlikely to be represented. The report may therefore be biased in favour of unusual incidents or those diseases that require laboratory investigation for confirmation.

APHA VICs have UKAS Accreditation and comply with ISO 17025 standard. SRUC Veterinary Services has UKAS accreditation at their central diagnostic laboratory and at the Aberdeen, Edinburgh, Perth, Ayr, Dumfries, Inverness, St Boswells and Thurso Disease Surveillance Centres which comply with ISO 17025 standard.

From September 2014 APHA contracted the services of partner Post Mortem providers. From April 2015, these services were provided by the Royal Veterinary College, the University of Bristol, University of Surrey and SRUC Veterinary Services. These providers contribute to the VIDA diagnoses recorded on the APHA FarmFile database and comply with agreed diagnostic criteria. To achieve a VIDA diagnosis, all testing must be carried out by a laboratory with ISO 17025 accreditation.

This report contains analysis of disease data from APHA, SRUC Veterinary Services division of Scotland's Rural College (SRUC) and partner post mortem providers (SRUC Veterinary Services, University of Bristol Veterinary School, Royal Veterinary College, University of Surrey, Wales Veterinary Science Centre) from samples submitted in the first quarter of 2018 compared to the equivalent quarter of previous years. It aims to identify emerging small ruminant disease related threats. The production of the report is underpinned by a large quantity of surveillance data and information, compiled as part of the Defra Plant and Animal Health and Animal Health and Policy Implementation Directorates. Further information can be found at http://apha.defra.gov.uk/vet-gateway/surveillance/index.htm.

New and re-emerging diseases and threats

Monitoring the trends in diagnoses of known diseases cannot, by definition, detect either new diseases or changes in endemic diseases that would prevent a diagnosis from being reached (for example a change in the pathogen that compromised the usual diagnostic test). Such new or emerging diseases would probably first be detected by observation of increased numbers of submissions for clinical and/or pathological syndromes for which a diagnosis could not be reached in the normal way. Submissions for which no diagnosis is

reached (DNR) despite testing deemed to allow reasonable potential for a diagnosis to be reached are regularly analysed to look for increases in undiagnosed disease which could indicate the presence of a new or emerging disease. Undiagnosed disease submissions are summarised broadly by the clinical presentation of disease and, once this has been determined by further investigation, the body system affected. Both groups are investigated and trends in the levels are compared over time.

Data recording by APHA and SRUC Veterinary Services was harmonised from 2007. The Species Expert Group reviews trends in VIDA DNR data each quarter with the aim of providing information on potential new or emerging diseases or syndromes. 'Prior years' refers to pooled data for 2008 - 2016 for GB VIDA data.

Supplementary analysis of APHA DNR data is also undertaken using an early detection system (EDS). This uses a statistical algorithm to estimate an expected number of DNR reports and a threshold value. If the current number of DNR reports exceeds the threshold (i.e. exceedance score>1), this indicates that the number of reports is statistically higher than expected. When this EDS identifies categories of submissions where the threshold DNR has been exceeded, the Species Expert Group reviews the data to investigate further. This review may involve assessment of individual DNR submissions. Where this DNR analysis finds no evidence of a new and emerging threat or other issue, the detail of these reviews in response to thresholds being exceeded may not be reported here.

Changes in disease patterns and risk factors

This section of the report gives information on occurrence of selected diseases. The data originate from submissions and are summarised and presented according to the diagnosis reached and assigned as a VIDA code. Our charts show the number of diagnoses (numerator) as a proportion of the number of submissions in which that diagnosis was possible (denominator), for all of GB, England & Wales and for Scotland. The bars indicate the 95% confidence limits. Note that the y-axis of the charts varies and therefore care must be taken when comparing individual charts.

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.

The report is available on GOV.UK at https://www.gov.uk/government/collections/animal-disease-surveillance-reports.

Any enquiries regarding this report should be sent to APHA's Surveillance Intelligence Unit by emailing SIU@apha.gsi.gov.uk.

More information about scanning surveillance reports is available on APHA's Vet Gateway at http://apha.defra.gov.uk/vet-gateway/surveillance/index.htm.

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.