VIDA diagnoses are recorded on the APHA FarmFile database and SAC Consultancy: 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 SAC C VS 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. SAC C VS have 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, the Wales Veterinary Science Centre and SACCVS. 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.
INTRODUCTION

This report contains analysis of disease data from APHA, SAC Consulting: Veterinary Services (SAC CVS) division of Scotland’s Rural College (SRUC) and partner post-mortem providers (SAC CVS, University of Bristol Veterinary School, Royal Veterinary College, University of Surrey and Wales Veterinary Science Centre) from samples submitted in the first quarter of 2017 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://ahvla.defra.gov.uk/vet-gateway/surveillance/index.htm.

OVERVIEW

Issues & Trends

Weather

Winter 2016/2017 was relatively mild. For the UK overall, January's mean temperature anomaly was +0.2 °C. February was mild in all areas, particularly during the second half. The mild winter meant that the vector free period for Culicoides activity was not declared until later than in previous years. The vector free period is declared when fewer than five female midges with abdominal pigmentation have been caught/trap/night. The pigmentation is an indication of age that means that the females have been actively feeding for a few days.

In France the vector free period was declared from 15th November to 27th December depending on the region.

Ecologists at the UK-based Centre for Ecology & Hydrology (CEH) have led a study with The Pirbright Institute and Rothampstead Research which informs optimal strategies for control of midge-borne diseases like bluetongue and Schmallenberg virus that affect cattle and sheep.

Industry

The first quarter of 2017 was characterised by continued low prices in the UK sheep sector and has generally been quite challenging. There was very poor retail demand in the first quarter, 33% lower than the first 12 weeks of 2016, combined with the high number of lambs being late to finish last year. These were carried over into 2017. This picture is supported by the slaughtering figures for the early weeks of Q1, which were consistently higher than the year before. By the middle of the quarter, supplies of clean sheep had been running around 6% higher than the same period in 2016. However, throughput slowed towards the end of the period and when compared with a year before cumulatively only about 2.3% more lambs had been slaughtered. Sheep meat imports into the UK have been low, which is reflected in the prices of NZ lamb, which is currently heavily discounted compared to those in the UK and is particularly large for this time of year. France is of course an important destination for UK lamb and unfortunately demand there has been disappointing too. This has also had an impact on French domestic prices, which has fed through to the prices that imported products can achieve. There
has been some recovery in prices in the lead up to Easter, which has attracted more hoggets and lambs to market.

Duncan Wyatt AHDB Beef and Lamb

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 SACCVS 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 2012-2017 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.

Analysis of Diagnosis Not Reached (DNR)

Sheep & Goats

Analysis of cases with DNR is performed every quarter by the Small Ruminant Species Expert group. There are no indications of any new or emerging disease syndrome. There was no significant change in the overall %DNR and no significant increases for any of the presenting signs or syndromes.

ONGOING NEW AND RE-EMERGING DISEASE INVESTIGATIONS

Schmallenberg (SBV)

On 21\textsuperscript{st} December 2016 Schmallenberg virus was confirmed by PCR on four occasions in sheep fetuses with deformities. These were from Devon (2) Dorset (1) and Somerset (1)

While SBV is currently categorised as endemic the Small Ruminant expert Group (SREG) felt it important to confirm the presence of the virus and at this early stage how widespread this appeared to be. APHA had been testing all submitted fetuses with deformities for SBV and had no confirmed cases during 2014 and 2015 but this routine surveillance detected the cases.
identified in December in sheep. The SREGand Cattle Expert Groups (CEG) recommended that surveillance for SBV be enhanced during the 2017 lambing and calving season.

Gross lesions that have been observed in cases of SBV-associated fetal malformation in ruminant foetuses include arthrogryposis, torticollis, scoliosis, kyphosis, brachygnathia inferior and various malformations of the brain and spinal cord, including hydranencephaly, porencephaly, and microcerebellum and thinning of the anterior and thoracic/lumbar spinal cord. When investigating fetal lesions, colleagues are reminded to remain alert to the possibility of differential diagnoses other than SBV, including for example, the possibility of hydranencephaly induced by in utero infection with bluetongue virus (a notifiable disease).

In January practitioners were advised via email and via the monthly VIC newsletter that in cases of sheep or cattle fetal malformation the test for SBV by PCR TC0905 on fresh brain should be requested and would be undertaken free of charge. VIOs were advised to use veterinary judgment to determine if the brain and spinal cord should be retained in fixative for potential histopathology (probably not in first cases) and the need for histopathology was reviewed by the relevant species lead on a case by case basis.

Subsequently APHA provided reports of cases confirmed by PCR by county, by country and by cattle and sheep on the APHA vetgateway site http://ahvla.defra.gov.uk/vetgateway/schmallenberg/index.htm, the first report online was 2nd February 2017 and the site has been updated fortnightly.

By the end of April 2017 the sheep cases confirmed by PCR are shown in Table 1 England and Table 2 Wales Table 3 Scotland

Table 1. SBV confirmed cases England

<table>
<thead>
<tr>
<th>County</th>
<th>Dec-16</th>
<th>Jan-17</th>
<th>Feb-17</th>
<th>Mar-17</th>
<th>Apr-17</th>
<th>Total</th>
</tr>
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</tr>
<tr>
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<td></td>
<td>1</td>
<td></td>
<td></td>
<td>3</td>
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</tbody>
</table>
Shropshire | 8 | 1 | 9  
Somerset | 3 |  | 3  
Staffordshire | 1 |  | 1  
Suffolk | 1 |  | 1  
West Yorkshire | 1 |  | 1  
Worcestershire | 1 |  | 1

Table 2. SBV confirmed cases Wales

<table>
<thead>
<tr>
<th>County</th>
<th>Dec-16</th>
<th>Jan-17</th>
<th>Feb-17</th>
<th>Mar-17</th>
<th>Apr-17</th>
<th>Total</th>
</tr>
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<td></td>
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<td></td>
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<tr>
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Table 3. SBV confirmed cases Scotland

<table>
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<th>County</th>
<th>Feb 17</th>
<th>Mar 17</th>
<th>Total</th>
</tr>
</thead>
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</tr>
<tr>
<td>Roxburgh</td>
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<td></td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Cattle cases have also been confirmed by PCR in England Wales and Scotland.

The University of Nottingham, collaborating with the University of Liverpool, are gathering evidence on the impact of Schmallenberg virus on farms this year. Please help make sheep farmers aware of the survey, regardless of whether there have been any symptoms of Schmallenberg virus in the flock or not. The questionnaire results will help further our knowledge of the virus and the problems it is causing to farmers and their flocks. The survey is anonymous. The link to the questionnaire can be found online:

[https://www.surveymonkey.co.uk/r/S5RGKS9/](https://www.surveymonkey.co.uk/r/S5RGKS9/)

Schmallenberg virus (SBV) was detected by PCR on brain tissue of an aborted lamb sent to APHA Bury St Edmunds to investigate reproductive problems close to term which included
seven shearlings that were scanned with dead lambs and seven abortions in a group of 300 ewes at risk. The absence of typical deformity features in this lambing batch was thought to reflect in utero infection of the foetuses later in gestation. From the same flock, a previous early lambing batch of 260 ewes had delivered lambs which displayed arthrogryposis although samples from these lambs had not been received.

APHA Penrith VIC also investigated a case where Schmallenberg virus (SBV) and Border disease virus (BDV) were detected in two aborted lambs from different dams. Lambing had just started and eight ewes had aborted within a group of 230 Mule ewes. The ewes were enzootic abortion and Toxoplasma vaccinated. None of the aborted ewes were ill. Two aborted lambs and placentae were submitted for investigation. One lamb had mild arthrogryposis affecting all limbs. There were no other musculoskeletal or brain abnormalities. The second lamb was mummified. The placenta of the first lamb was unremarkable, whereas the placenta of the second lamb had multifocal pinpoint white foci within its cotyledons. Tests for common ovine abortifacients including Toxoplasma gondii, Chlamydia abortus and Campylobacter sp. were negative. Further testing was performed in this case. SBV was detected in the brain of the arthrogryposis lamb by PCR. BDV was detected in the spleen of the mummified lamb by PCR.

Salmonella

Monitoring has continued for cases of Salmonella Typhimurium DT104. In Wales a cluster of five cases in sheep and one in cattle and two horses were identified on the Island of Anglesey.

Surveillance was enhanced with salmonella screening of all faecal samples from Anglesey. Concerns were that further cases might arise as the lambing season got underway in February.

No further cases have been identified since January on Anglesey and farm visits were carried out on the affected farms. The salmonella team continue to monitor cases and have liaised closely with Public Health England and Public Health Wales. Whole genome sequencing has been performed on both human and animal isolates to try to establish potential links. In addition an epidemiologist has been assigned to review the current data to determine if a trend or links can be identified.

UNUSUAL DIAGNOSES

Cardiovascular disease

SAC Disease Surveillance Centre St. Boswells diagnosed an unusual cardiac disease in a pure-bred sheep. An on farm post-mortem examination, following the sudden death of a two-year-old border Leicester ewe, revealed extensive thoracic haemorrhage. An 18-20 mm split was found in the wall of the aorta and histopathology findings were consistent with aortic dissection with no evidence of underlying aneurysm or inflammation. Aortic dissection is well described in humans, and there are several human genetic disorders such as Marfan and Ehlers-Danlos syndromes that can result in aortic rupture. A Marfan-like genetic mutation has also been identified in Holstein cattle. No similar mutation has as yet been identified in sheep and any further cases would warrant further investigation.
Neurological disease

University of Bristol Farm Animal Pathology Service investigated a case where a group of 21 goat kids from a dairy unit were disbudded and several hours later four became unwell with progressive difficulty standing and weakness; three died. One kid did not improve despite supportive care including antibacterial and nonsteroidal therapies over five days and was presented for PME. The farmer was concerned that the disbudding process was the cause of the clinical signs.

The kid could not stand and gentle flexing and twisting of the neck appeared to elicit a pain response with bleating. The site of the disbudding procedure was unremarkable and consistent with normal healing; the skin peeled off the cranium with no obvious signs of bacterial infection associated with the disbudding wounds. There was a firm swelling in the caudal ventral aspect of the bone of the cervical vertebrae with narrowing of the spinal cord. The underlying bone was pale brown and appeared necrotic (Fig 1); a small amount of thick cream purulent material was collected from the bone for culture. A heavy growth of an alpha-haemolytic *Streptococcus* spp. was isolated and identified as *S. dysgalactiae equisimilis*. The findings were interpreted as a form of joint ill of the spinal column – no other joint or other lesions suggestive of infection were found.

It was considered unlikely that the disbudding procedure had precipitated the infection, given the chronic nature of the lesion.

Further reading


![Fig 1. Longitudinal section of the caudal cervical vertebrae showing abnormal bone and signs of necrosis (arrows)](image-url)
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.

Parasitology

Parasitic Gastroenteritis

There has been a significant increase in the number of incidents of PGE recorded in sheep in GB in quarter 1 compared to the same quarter in 2016 (fig 2). This was particularly marked in Scotland. The reason for this is likely to be sheep grazing infected pastures through the warmer, wetter weather particularly in February and March 2017. This indicates that monitoring for disease should continue throughout these months in grazing lambs.

![Fig 2. GB incidents of parasitic gastroenteritis as a % of diagnosable submissions Q1 2005-2017](image)

There were also a small number of incidents of early PGE nematodirosis commented on in APHA VIC monthly reports, indicating an early hatch of infective larvae in some areas. This disease usually peaks in the second quarter of the year.

Chronic fasciolosis

There was a significant increase in the incidents of chronic fasciolosis diagnosed in GB this quarter, compared to the same quarter in the previous 3 years (2014-2016) (fig 3). This was due to increases seen in England and Wales. In Scotland, number of incidents in 2017 were similar to the same quarter in 2016. Warm wet summers and the inefficacy of the one drug that can kill all stages of Fasciola hepatica, triclabendazole, are likely to be the reasons for this increase. An number of APHA Veterinary Investigation Centres (VICs) indicated suspect inefficacy of this drug and reports to VMD were made or advised.

In February the Wales Veterinary Science Centre issued an alert to practitioners in Wales.
Fig 3. GB incidents of chronic fasciolosis as a % of diagnosable submissions Q1 2005-2017

**Sheep Scab**

The number of incidents of sheep scab recorded by APHA and SAC in quarter 1 in 2016 and 2017 were significantly more than seen in 2015 (fig 4). There were anecdotal reports of lack of efficacy of various injectable macrocyclic lactones on a small number of farms over this period, where seemingly correct whole flock treatment was given on a number of occasions, with laterly no clinical improvement seen. APHA is working with the University of Bristol who are developing an in-vitro test for macrocyclic lactone resistance in *Psoroptes ovis* mites. Cases were also reported to the VMD as suspect lack of inefficacy. In all cases, clinical signs improved following treatment with an organophosphate dip.

Fig 4. GB incidents of sheep scab as a % of diagnosable submissions Q1 2005-2017

**Systemic disease**

*Mannheimia septicaemia*

There was a significant increase in the numbers of *Mannheimia* septicaemia cases recorded by APHA. There were 7 diagnoses (0.73% of diagnosable submissions) compared to just 1 during 2016 (0.10% of diagnosable submissions). The typical rate of diagnosis for this disease during the first quarter is less than 0.45%. One case was a debilitated adult sheep, the remaining cases were lambs between 3 days and 4 weeks of age, and all but one case were recorded in March. Particularly changeable weather at that time could have provided an increased risk of the disease, as well as other concurrent factors in individual cases, such as weak lambs due to
concurrent enzootic abortion in one flock and navel infection in another. Although the number of diagnoses of *Mannheimia* pneumonia was consistent with previous years for this quarter, *Mannheimia* diagnoses will continue to be monitored closely in case this is an early indication of emergence of a new serotype.

APHA Carmarthen VIC investigated the death of a one-month-old lamb submitted for examination which was due to a **severe abomasitis due to Mannheimia spp.** This lamb, one of twins was found recumbent, was given antibiotics by the owner but died shortly afterwards. A similar lamb died 2 days previously from this group of 10 ewes and twins. This lamb had been out over 2 weeks on the same field after lambing indoors. The abomasal serosal surface was dark red in patches(fig 5). The abomasal wall was grossly thickened from the body and towards the cardia and the mucosa was dark red/ black in colour. The abomasal folds were thickened. There were some surface erosions. There was a moderate amount of cloudy yellow fluid free in the peritoneal cavity and a small number of fibrin tags over internal organs. A swab of the abdominal fluid and culture of the spleen revealed a pure growth of *Mannheimia* spp. It was advised that vaccination of the lambs was considered. A vaccination schedule was also advised for the ewes in the future

**Fig 5 Abomasitis showing discolouration and oedema of abomasal folds**

**Musculo skeletal disease**

**Arthritis due to Streptococcus dysgalactiae subsp dysgalactiae**

Diagnoses of arthritis due to *Streptococcus dysgalactiae subsp dysgalactiae* were increased this quarter with 21 (1.80%) incidents recorded compared to 10 (0.81%) in 2016 (fig 6). Increases were seen by both APHA and SAC. This may be due to the milder weather over the lambing period.
Fig 6. GB incidents of Arthritis – *Strep dysgalactiae* as a % of diagnosable submissions Q1 2005-2017

Two, four-week-old lambs were submitted to the University of Bristol from a farm with a long history of joint ill often resulting in culling of hoggets due to severe lameness. This year, 20 out of 330 lambs were lame. One lamb was profoundly lame on a forelimb while the other seemed normal on clinical examination although it had received antimicrobial therapy. On postmortem examination (PME) there was thickening of the shoulder joint in one lamb and involvement of several joints, especially the stifles, in the other lamb. In the first lamb there was evidence of a navel infection tracking internally. *Streptococcus dysgalactiae* was isolated from the joints, isolates were sensitive to most antibiotics except tetracycline, which is commonly seen with these isolates and may explain the poor response to therapy on some farms if oxytetracylines are being used. *Streptococcus dysgalactiae* can be carried by ewes in the vagina. Therefore, scrupulous attention to hygiene at lambing (wearing and changing gloves between lambing, keeping bedding clean because hay and straw may harbour bacteria for short periods) and with all subsequent procedures e.g. tail docking, ear tagging, is important to reduce the risk of spread (Rutherford and others 2014).

**Enteric disease**

**Abomasal bloat**

Abomasal bloat was the feature of recent discussion on the Sheep Veterinary Society Yahoo group. APHA Carmarthen VIC investigated the death of a three- to four-week old lamb which was due to abomasal bloat, haemorrhage and ulcers. Ten lambs had died out of a group of 120. The lambs were pet lambs on *ad lib* milk replacer. They had creep available from a few days of age, also *ad lib*. The affected lambs had been found dead and appeared bloated. On PME the abomasum was very distended and had ruptured. There were a few small ulcerated areas and haemorrhage on the mucosal surface of the pyloric region. This syndrome has mainly been described in 3 to 4 week old lambs. It appears more common in lambs fed warm milk replacer, particularly when they drink large quantities at infrequent intervals. *Sarcina ventriculi* and *Clostridium sordelli* have been implicated in this condition. Anaerobic cultures were carried out and however no *Clostridium sordelli* was isolated in this case. Reference: Diseases of sheep; 4th edition (Ed. ID Aitken) page 177 for further information.

**Nervous disease**

**Hypoglycaemia encephalopathy in lambs**
A problem of weak neonatal lambs that would not suckle was investigated by the submission of three typical cases to APHA Penrith VIC. Approximately 50 lambs had been affected. The ewes were reportedly in poor condition and lambing earlier than expected. PME of the lambs was unremarkable and there was no evidence of septicaemia on routine bacteriology. Histopathology of the brains revealed a severe, superficial and mid laminar cerebrocortical necrosis. The nature and pattern of the changes was suggestive of an in utero insult, most likely the result of hypoglycaemia due to a maternal energy deficit (twin lamb disease) within the ewes. APHA identify cases of this each year, and have been described (Scholes and others 2009).

Ovine Protozoal Myeloencephalitis (OPM)

Fixed spinal cord was submitted to APHA Shrewsbury VIC from a nine-month-old lamb with a history of neurological disease including hind limb paresis progressing to recumbency. A moderate to severe non-suppurative myelitis with intralesional protozoa was seen on histopathological examination consistent with a diagnosis of protozoal myelitis due to Sarcocystis spp infection. The organism implicated in the UK is Sarcocystis tenella and infection is via ingestion of oocysts from contaminated pastures. Carnivores, dogs and foxes are considered to be the major host with sheep as the intermediate host in the life cycle.

There are several different Sarcocystis species and infections are not uncommon in sheep. Past seroprevalence studies suggest that exposure to S. tenella infection can be demonstrated in over 80% of sheep. The presence of mature cysts embedded in striated muscle tissue including the myocardium is a common incidental finding rarely associated with any clinical manifestations. However, in some cases the weight of challenge appears sufficient to initiate widespread infection extending into the nervous system. There are no disease control measures but prompt disposal of casualty sheep carcases and raw sheep offal to prevent consumption by scavenging carnivores will reduce opportunities for transmission of infection.

Reproductive & Mammary disease

Coxiella burnetii

SAC Dumfries DSC confirmed the presence of Coxiella burnetii in two separate sheep flocks. A foetus and placenta were submitted from a flock of 90 Beltex ewes where a diagnosis of EAE had been reached in a previous submission. In this case the MZN smear proved positive however the organisms seen were not considered typical of Chlamydophila abortus. Twin fetuses from a second flock were also submitted with similar findings. In both cases PCR testing for Coxiella burnetii proved positive. Lesions of placentitis were evident on histopathology; however, immunohistochemistry was negative for C. burnetii. Although not proven to be the cause of abortion in either case the detection of C. burnetii is significant due to its zoonotic potential. Information to reduce the risk of infection was provided to both farms. These cases also demonstrate the difficulties in diagnosing this disease.
Salmonella Urbana fetopathy

SAC St. Boswells DSC diagnosed *Salmonella* Urbana as the cause of abortion storms in two separate flocks. 20 of 320 Texel cross ewes aborted in the first flock. The foetuses were autolysed and five ewes died. The field had been flooded twelve days prior to the first abortion and the same salmonella serotype was isolated from a pond in the field. The second flock of 1700 ewes experienced more than 30 abortions and some ewes were sick. Investigations are ongoing.

Urinary disease, Skin disease, Metabolic disease, Respiratory disease

No statistical significant increases for any of the diseases monitored

TSE


The report shows that between January 2017 and April 2017 there have been no confirmed cases of classical scrapie in Sheep or goats and two cases of atypical scrapie in sheep.

Bovine TB in non-bovine species


In the previous quarter two farms in England were confirmed with Bovine TB in sheep in England.

**HORIZON SCANNING**

International Disease Monitoring
(These reports can be found at [https://www.gov.uk/government/collections/animal-diseases-international-monitoring](https://www.gov.uk/government/collections/animal-diseases-international-monitoring))

Bluetongue

France has reported over 550 new BTV-8 virus positive animals since January 2017 (fig 7); the majority of these are a result of pre-movement testing which is in place, and the sentinel surveillance in cattle in the areas under disease restriction. BTV-8 has been detected in the Nord département and as of the 17th February the restriction zone was increased to include the départements of the Nord, Pas-de-Calais, Somme, Oise and part of the Seine Maritime. Only 4 departments now remain free of BTV8 in France (Finistère, Calvados, Orne and Eure). The nearest case to the UK is still over 150 km away and therefore there are no restriction zones in the UK for bluetongue.

The disease situation in Q1 is in the context of the ‘vector-low’ period: Seasonal vector free periods for the past three years have been:

17th December – 12th April (2015/16)
26th November – 14th April (2014/15)
14th January – 1st April (2013/14)

Temperature range limit for replication of BTV is currently considered to be 12°C.

Looking ahead, the vector active period will begin in the next quarter in France, and similarly in GB. It is highly likely that the risk of BTV-8 reaching GB will increase. Colleagues are reminded of the importance of reporting suspicion of disease, both clinical and pathological.

A recent serological study suggests that it is likely that BTV-8 may have spread at low levels before its re-emergence in August 2015, even in areas considered virus-free. The paper suggests that the low number of animals showing clinical signs since the re-emergence contrasts with the past outbreak and further investigations are needed to identify a potential shift in the epidemiological dynamic (Courtejoie and others 2017).

Elsewhere, Italy continues to report BTV-4 in the North of the country and has also reported BTV 1 and Serbia has reported BTV-4 (Fig 8). Austria has reported a single outbreak in cattle of BTV-4, detected during routine surveillance (April 2017). The single animal was PCR and antibody positive and the small herd was located in the restriction zone, so no further action is required.

It is still early in the season for significant virus circulation to be occurring in the North of Europe.
BTV-8 vaccine has been available for the GB market since mid-July, and the decision to vaccinate should be taken by the farmer, in consultation with their private veterinary surgeon. For information on bluetongue and the vaccine availability in GB, see the announcement by the NFU at [www.nfuonline.com/bluetongue](http://www.nfuonline.com/bluetongue).

**Foot and Mouth disease**

Foot and Mouth Disease – [Low risk – no change] – An outbreak of FMD A in Tunisia has been reported as a result of likely illegal movement of animals. Possibly related to the reports in Algeria. The EU has highlighted the risk of movements of livestock transport from these regions – such as horse transport – as a fomite risk, primarily into Southern Europe.

**Sheep and Goat Pox**

Israel has reported one outbreak in sheep on a commercial farm in Hadera. Disease control measures are in place. Turkey has reported 17 outbreaks of Sheep Pox, a number of these outbreaks were the result of purchasing infected animals or contact in a common grazing area. Disease control measures are in place.

**Peste de Petite Ruminants PPR**

In the previous quarterly report we highlighted the FAO eradication plans. Nevertheless Turkey has recently reported 5 outbreaks in the north of the country. In addition National Veterinary Higher School, Algiers and The Pirbright Institute have highlighted the continuing spread of this virus in north Africa and potential threat this poses to the introduction to Europe (Baazizi and others 2017).
Diagnostic submission trend

Throughput

Sheep

Sheep submissions appear to be increased over the same quarter as last year. This may be due to increased numbers of submissions through the free carcase collection service.

Goat

Submissions of goat carcases have increased over the same quarter last year.
 Diagnostic rate

Species - SHEEP

Type - Carcase

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>%</th>
<th>2016</th>
<th>%</th>
<th>2017</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosed</td>
<td>640</td>
<td>84%</td>
<td>351</td>
<td>93%</td>
<td>413</td>
<td>94%</td>
</tr>
<tr>
<td>Limited Test</td>
<td>31</td>
<td>4%</td>
<td>23</td>
<td>5%</td>
<td>17</td>
<td>3%</td>
</tr>
<tr>
<td>Reas. Test</td>
<td>92</td>
<td>11%</td>
<td>72</td>
<td>15%</td>
<td>49</td>
<td>10%</td>
</tr>
</tbody>
</table>

Diagnostic rate for sheep carcase submissions is maintained at over 80%

Type - Foetus

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>%</th>
<th>2014</th>
<th>%</th>
<th>2015</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosed</td>
<td>530</td>
<td>57%</td>
<td>475</td>
<td>55%</td>
<td>469</td>
<td>57%</td>
</tr>
<tr>
<td>Limited Test</td>
<td>131</td>
<td>14%</td>
<td>112</td>
<td>14%</td>
<td>105</td>
<td>15%</td>
</tr>
<tr>
<td>Reas. Test</td>
<td>272</td>
<td>30%</td>
<td>230</td>
<td>29%</td>
<td>211</td>
<td>20%</td>
</tr>
</tbody>
</table>

Diagnostic rate for sheep fetus submissions is maintained at over 50%
Goats

Species: GOAT

**Type - Carcase**

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Diagnosed</td>
<td>31</td>
<td>19</td>
<td>12</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>Limited Test</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Reass. Test</td>
<td>8</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100%</td>
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<tr>
<td>100%</td>
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</tbody>
</table>

The diagnostic rate for goats is lower than for sheep but is maintained at over 70%

**Most common diagnoses**

The development of the sheep dashboards allows a visualisation of surveillance information that is gathered from submissions to the GB veterinary diagnostic network, i.e. to APHA’s Veterinary Investigation Centres in England and Wales, to SRUC’s Disease Surveillance Centres in Scotland and to APHA’s network of universities and other partners who provide post mortem services under contract.

A count of the most common diagnoses made during Q1 are shown in Table 3

**Table 3 Count of the top 10 most common diagnoses Jan – Mar 2017**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abortion-Chlamyophyde abortus</td>
<td>179</td>
</tr>
<tr>
<td>Chronic fasciollosis</td>
<td>139</td>
</tr>
<tr>
<td>Abortion-Toxoplasmosis</td>
<td>129</td>
</tr>
<tr>
<td>Schmallenberg virus infection causing congenital abn..</td>
<td>123</td>
</tr>
<tr>
<td>Abortion-Campyobacter</td>
<td>109</td>
</tr>
<tr>
<td>Parasitic gastroenteritis</td>
<td>109</td>
</tr>
<tr>
<td>Johne’s Disease</td>
<td>50</td>
</tr>
<tr>
<td>Abortion -Not listed</td>
<td>44</td>
</tr>
<tr>
<td>Pregnancy toxemia</td>
<td>39</td>
</tr>
<tr>
<td>Hereditary anomalies</td>
<td>38</td>
</tr>
</tbody>
</table>

**Maps**

The map (fig 9) shows submissions for sheep and has been developed in collaboration with the Data Systems Group GIS team at APHA Weybridge, who generate the outputs to support the
work of the SIU in evaluating the coverage of scanning surveillance activities in England and Wales.

Submission data was extracted from the VIDA database in order to include submissions to the diagnostic laboratories of SAC from holdings in England and Wales and are limited to those holdings that could be georeferenced. Please note that it is not currently possible to include Scottish data.

Demographic data on the underlying population of holdings by species is based on the work of the Livestock and Demographic Data Groups and derived from Sheep and Goats: Annual Inventory extracts as at December 2015.

The submission ratio for each species is the proportion of sheep holdings that submitted at least one carcase or diagnostic sample in the reference period over all holdings of that species in the spatial unit county.

Fig 9: Spatial distribution of Small Ruminant submissions Q1 2017
Publications of interest

Sheep and goats papers published by APHA staff January - March 2016

CARSON A; APHA Small Ruminant Expert Group 2017 Focus on ovine abortions. Veterinary Record 180 (10) 247-247.


Lambton SL; BROUWER A; Knowles TG; Richards G; Statham PTE; Walton J; Weeks CA 2017 Factors affecting the ability of sheep to rest during time in markets in Great Britain. Animal Welfare 26 (1) 83-93.

Other publications of interest


References


