GB Emerging Threats Quarterly Report
Small Ruminant Diseases

Quarterly Report: Vol 20: Q3
July – September 2017

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Highlights

- Sheep dashboards                                       | 8    |
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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 Postmortem providers: 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 postmortem providers (SAC CVS, University of Bristol Veterinary School, Royal Veterinary College, University of Surrey and Wales Veterinary Science Centre) from samples submitted in the third 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

This summer was notably wet, with rainfall above average for the UK in each individual month. Provisionally this ranks as the ninth wettest summer in the UK in a series since 1910. It was also slightly warmer than average, but that is largely due to a warm June, as from mid-July onwards the weather was often on the cool side with an unsettled westerly regime (Fig 1).

This meant that conserving hay and silage for winter feeding was significantly disrupted. In some areas some forage was conserved in early June but in many areas forage was conserved later in the year affecting both the quality and quantity available for the winter which is particularly important for the development of fetuses during pregnancy and the ewes ability to produce quality colostrum at lambing.

Rainfall in the preceding winter and summer influences the risk later in the year for liver fluke and warnings were issued in October by NADIS http://www.nadis.org.uk/ of a "high-risk" of fluke infection in Western Scotland and South Wales this autumn; and "medium-risk" in Eastern Scotland, NW England, and SW England, and North Wales.

SCOPS http://www.scops.org.uk will also be issuing monthly alerts based on the NADIS parasite forecasts and includes advice on testing options to confirm the presence of fluke.
Fig 1: Summer 2017 mean temperature anomaly and rainfall (right) compared to 1981-2010 expressed as % of the average for 1981-2010

Industry

The UK Year book 2017 for sheep is now available to download from AHDB


During the third quarter of 2017, lamb prices began to fall as higher numbers of new season lambs came forwards. Retail demand has continued to be under pressure from both poultry and pork. Slaughterings have been down by 5% in Q3 this year compared to last year despite Defra’s June livestock survey recording a 2% rise in lamb numbers. Production has also fallen year-on-year by 5% and stood at 76.3 thousand tonnes during the quarter. Production in the year-to-date is still higher than the same period last year due to the high number of store lambs held over from 2016. As recorded in the first half of 2017, imports have continued to decline year-on-year in Q3. Total imports of sheep meat during Q3 stood at 14.7 thousand tonnes, a 10% decline compared to the same quarter last year. The strong New Zealand dollar compared to sterling has continued to help limit the amount of New Zealand imports coming into the UK; while also being supported by New Zealand reacting to the increase in sheep meat demand in Asia. Demand in France has started to increase from the low levels recorded earlier in the year. However, demand is still lower than this time last year. UK exports during the third quarter of 2017 totalled 21.8 thousand tonnes, a rise of 4% year-on-year.

Report by Rebecca Oborne 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 2010-2014 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

Analysis of cases with DNR is performed every quarter by the Small Ruminant Species Expert group. Overall % DNR rate in sheep submissions Q3 is presented in the table below:

<table>
<thead>
<tr>
<th></th>
<th>July-September Prior Years 2008 to 2016</th>
<th>July-September 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB</td>
<td>14.91 %</td>
<td>9.91 %</td>
</tr>
<tr>
<td>APHA</td>
<td>14.74 %</td>
<td>5.36 %</td>
</tr>
<tr>
<td>SAC</td>
<td>15.17 %</td>
<td>11.30 %</td>
</tr>
</tbody>
</table>

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
Tick-borne fever

Tick-borne fever (TBF) is a rickettsial infection caused by Anaplasma phagocytophilum. Epidemiology of infection is linked to the life cycle of the tick vector Ixodes ricinus: the disease is seasonal, linked to tick activity, peaking in spring and autumn in upland grazing areas.

A. phagocytophilum multiplies in neutrophils which are destroyed, producing profound neutropenia lasting for 2-3 weeks. In addition there is lymphocytopenia and transient thrombocytopenia. The resulting immunosuppression can predispose to other infectious diseases such as louping ill, respiratory infections and polyarthritis (Woldehiwet 2010). Naïve pregnant ewes may also abort.

Recent cases submitted for postmortem examination demonstrate this. An abortion storm in a group of 110 hoggets, part of a flock of 1,000 ewes, was investigated by the Wales Veterinary Science Centre. Positive PCR results for TBF were recorded in spleen from one hogget and pleural fluid from one of three foetuses examined. Blood samples from two other aborting hoggets were also TBF PCR-positive.

Blood samples were submitted to APHA Shrewsbury Veterinary Investigation Centre (VIC) from a group of 150 ewe lambs recently turned out onto tick-infected pasture on which 21 sheep had died and others were moribund and pyrexic, with reports of unilateral lameness. One sample tested positive to TBF by PCR, suggesting that exposure of naïve animals to ticks may have predisposed the group to other health threats for example increased susceptibility to secondary infections such as tick pyemia, pneumatic pasteurellosis, louping ill, and listeriosis.

APHA Penrith VIC also investigated a flock where eight lambs had been found dead or recumbent (followed by rapid death) over ten days, in a group of 80 Texel-cross lambs. TBF with secondary tick pyaemia was diagnosed as the cause of nervous signs and rapid death in three lambs examined. Staphylococcus aureus was isolated from the joint fluid of one of the lambs and PCR testing was positive for A. phagocytophilum in all three lambs.

Prevention of TBF relies on the application of an effective pour-on to lambs before they are turned out onto tick-infested areas. Many hill ewes in endemic areas are brought off the hill for lambing, so lambs can be treated before they return to the hill. Pregnant animals should never be moved from tick-free to tick-infested areas.

VIDA data show an increase in the number of diagnoses of TBF since 2013 (Fig 2). An improved ability to detect TBF through the PCR test which was introduced in 2014, raised awareness and more testing may in part explain this increase. However, threats from tick borne disease may also be increasing due to increased movement of animals, increasing numbers of wildlife hosts (e.g. deer), climate change and environmental schemes that may promote tick habitats.

A storyboard about the changes in the patterns of TBF diagnoses in recent years has been created on the Sheep disease surveillance dashboard.
The Sheep Veterinary Society Autumn meeting (Monday 25th - Wednesday 27th September 2017) featured a tick disease session where these issues were discussed.

![Fig 2 VIDA diagnoses of TBF since 2013](https://public.tableau.com/profile/siu.apha#!/vizhome/tick-bornefever/TBF)

**UNUSUAL DIAGNOSES**

**Idiopathic eosinophilic meningoencephalitis**

APHA Thirsk VIC received the carcase of a shearling ewe for postmortem examination. Two days previously the ewe had been found separated from the group and staring into space. She died despite antibiotic and anti-inflammatory treatments. The ewe was the only animal affected from this group of 100 at grass. Gross examination was unremarkable and no significant organisms were isolated on routine brain culture. Brain histopathology identified a severe, multifocal, subacute, eosinophilic meningo-encephalitis. Such cases are extremely rare and often only manifest in individual animals. The underlying aetiology could not be determined in this case as there were no additional pathological changes in the brain or other tissues (lung, heart, lymph node) to suggest the involvement of parasites or fungi. A hypersensitivity reaction could not be ruled out.

**Pituitary abscessation**

A pedigree Texel ewe was submitted to APHA Shrewsbury VIC for postmortem examination following a prolonged period of ataxia with a slight head tilt, which progressed to fluctuating head swelling, sight defects and poor body condition. On gross examination there was evidence of thinning of the skull over the left cortex, and on removing the skull cap the left cerebrum was swollen and was largely occupied by a pocket of green pus. A similar smaller
abscess had also resulted in enlargement and distension of the pituitary gland. Pituitary abscessation is a sporadic neurological condition in ruminants with cases in cattle described more frequently. The origin of the pituitary abscess, with tracking of infection into the cerebrum was not determined in this case, however vascular/lymphatic dissemination of bacteria from other sites of suppurative infection are deemed the most likely source in many cases.

**Haemothorax in a five-month-old Texel ram lamb**

A number of cases where haemothorax has been a feature have been detected in young Texel ram lambs in the previous few months. These include carcasses submitted to APHA VICs, University of Bristol and to Farm Post Mortems Ltd operating out of the fallen stock centre in Hamsterley and have been discussed by the Small Ruminant Group. A recent case is described here.

A five-month-old Texel ram lamb was submitted to APHA Thirsk VIC for postmortem examination. This was the third ram lamb from this group to be found dead over a three day period. No clinical signs had been seen in any of them prior to death. The ram lambs were out at grass with cereal feed in addition to the grass.

There were large lesions/areas of haemorrhage and fibrosis attached to both the cranial and caudal surfaces of the diaphragm, adjacent to the areas where the oesophagus, vena cava and aorta pass through. The section of the diaphragm adjacent to where the oesophagus and caudal vena cava pass through the diaphragm was thinner (<1mm thick) than the surrounding central diaphragmatic tissue.

There was a corresponding thickening of a 2-3 cm length of the aorta wall at the point where it passes through the diaphragm. The right pleural cavity contained approximately one litre of blood and a large blood clot of 20cm x 30 cm around the right lung lobe and a 10cmx10cm blood clot in the caudal mediastinum. The cranial 50% of the right lung was darker and collapsed.

The rumen was distended with gas, fibrous material and grain (barley type). Cereal accounted for 40-50% of the rumen contents and the rumen pH was 5.0.

There was an area of well demarcated consolidation of the cranial 10% of the left lung. Histology revealed necrosis of tissues with extensive granulation tissue and fibrosis, with deposition of collagen. This puts a time frame to the damage to these tissues in the order of 5-10 days. The section interpreted as aortic wall appeared to be lacking normal architecture, but the extent of the lesions made orientation difficult.

The cause of death in the lamb was a combination of haemothorax and bloat/ruminal acidosis. It is possible that the acidosis and increased abdominal pressure had triggered the rupture of a fragile blood vessel in the right thorax. It was difficult to determine which blood vessel had ruptured as the large blood clots were adhered to the structures in the mediastinum and right pleural cavity. It is also likely that earlier haemorrhages (one to two weeks prior to submission)
had contributed to the lesions in the diaphragm and in the tissues around the aorta. Further investigations are ongoing to determine the underlying cause of these fatal haemorrhages.

**Bolus and drenching gun injuries**

A low number of cases continue to be detected every quarter. In this case a bolus gun injury was the cause of death of two four-month-old lambs where 20 had died since bolusing two weeks earlier. A bolus was found in the caudal pharynx adjacent to the oesophagus (fig3) of both lambs at postmortem examination. Blood clots were found within the oral cavity, rumen, trachea and bronchi of one of the lambs.

![Fig 3 Bolus in the caudal oropharynx](image)

A review of bolus administration technique was advised to include whether supplementation by bolus was in fact necessary. The review should also include checking that the appropriate equipment is used and that the boluses are suitable for the type and age of animal. A worm egg count in one of the lambs found a heavy infestation of trichostrongyle-type eggs and anthelmintic treatment was recommended.

**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 GB Sheep Disease Surveillance Dashboard**

In June 2017 the Surveillance Intelligence Unit launched the Sheep Disease Surveillance Dashboard, this was followed in September by a Cattle Dashboard and a Pig Dashboard was released on 31/10/17.

The Sheep Disease Surveillance Dashboard was developed to share the 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 SAC’s Disease Surveillance Centres in Scotland and to APHA’s network of universities and other partners who provide post
mortem services under contract


To find your nearest VIC or partner PME site use APHA’s postcode finder on the Vet Gateway

http://ahvla.defra.gov.uk/postcode/pme.asp

The interactive dashboard

https://public.tableau.com/profile/siu.apha#!/vizhome/SheepDashboard_/Overview

illustrates diseases diagnosed in sheep across GB in an attractive and interactive format. Diseases of interest can be selected by county, region or across GB by using the interactive map. Filters can also be used to show diagnoses by time period and age group of sheep. Vets and farmers can now quickly and easily access information on the most common diagnoses in an area, or learn where specific diseases have been diagnosed.

The maps simply show the count of diagnoses made in each county. To give some context, a broad indication of the relative sheep population is provided, based on the number of sheep per square kilometre in each county, according to the Annual Sheep and Goat Survey:

- Low sheep density - up to 40 sheep per square kilometre
- Medium - between 40 and 80 sheep per square kilometre
- High - above 80 sheep per square kilometre

A higher count of diagnoses may be due to more submissions from a county with a large number of sheep or sheep holdings, better vigilance among the local farmers and vets or more use of the GB diagnostic network in a particular area. Diseases not requiring a laboratory diagnosis or in flocks whose veterinary practice has their own diagnostic facilities won’t be represented in the data. These limitations mean that the data and maps can’t be used to make inferences on the amount of disease within, or to make comparisons between, individual counties.

The information is updated in the fourth week of each month with the data from the previous month.

Fig 4 shows the most commonly diagnosed diseases during the months July, August and September 2017 with internal parasites contributing most to deaths in sheep. Trace element deficiencies for example selenium and Pine due to cobalt deficiency are commonly diagnosed in growing lambs that are failing to thrive at this time of year.
Looking forward and using the combined data for the winter months December (not including Dec 2017) January and February from 2012 to 2017, Fig 5 allows possible prediction of common disease to consider as potential threats to sheep. In the graph below I have not included diagnoses for abortion.

In addition the dashboards can show the most commonly diagnosed causes of abortion over the last 5 years:

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enzootic</td>
<td>2,004</td>
</tr>
<tr>
<td>Toxoplasmosis</td>
<td>1,271</td>
</tr>
<tr>
<td>Campylobacter</td>
<td>850</td>
</tr>
<tr>
<td>-----------------</td>
<td>------</td>
</tr>
<tr>
<td>Schmallenberg</td>
<td>474</td>
</tr>
<tr>
<td>Not listed</td>
<td>434</td>
</tr>
<tr>
<td>Congenital abnormality</td>
<td>342</td>
</tr>
<tr>
<td>Salmonella</td>
<td>163</td>
</tr>
<tr>
<td>Listeria</td>
<td>161</td>
</tr>
<tr>
<td>Not listed reproductive</td>
<td>74</td>
</tr>
<tr>
<td>T. pyogenes</td>
<td>57</td>
</tr>
<tr>
<td>Salmonella Montevideo</td>
<td>46</td>
</tr>
<tr>
<td>Salmonella dublin</td>
<td>45</td>
</tr>
<tr>
<td>Bacill.licheniformis</td>
<td>43</td>
</tr>
<tr>
<td>Yersinia sp</td>
<td>41</td>
</tr>
<tr>
<td>fungi</td>
<td>10</td>
</tr>
</tbody>
</table>

### Livestock Demographic Reports

The APHA Livestock Demographic Data Groups have now published their 2016/17 reports which give the Livestock Population Density maps for GB for Sheep, Goats, Cattle, Pigs and Poultry. This is the first time that these reports have been publicly available for some time. Fig 6 shows the sheep population density January 2016


For additional information and contacts please visit the relevant Species Expert Group pages via this link: [http://ahvla.defra.gov.uk/vet-gateway/surveillance/seg/index.htm](http://ahvla.defra.gov.uk/vet-gateway/surveillance/seg/index.htm)
Syndromic alerts were raised this quarter for the following diseases:

Pine/Cobalt deficiency, Bibersteinia trehalosi septicaemia, Pasteurellosis, PGE and PGE Nematodirus & Haemonchus, Intestinal torsion, Laryngeal chondrosis.

Parasitology

PGE Haemonchosis

There were 27 incidents of PGE Haemonchosis in sheep, 4.3% of diagnosable submissions in this quarter of 2017 in GB. This is significantly more than seen in the same quarter in the previous two years (Fig 7) Disease was diagnosed on post mortem examination or on specific staining for Haemonchus spp. in faecal egg counts. Disease was also recorded in goats.

Haemonchus contortus is a severe parasite in tropical and sub-tropical areas of the world. In GB, PGE Haemonchosis is a sporadic cause of clinical disease in sheep although the parasite
is present on a large number of UK sheep farms. Environmental conditions and possible anthelmintic resistance allow it to predominate suddenly. Disease can occur in lambs and adults, or the parasite can halt development (or hypobiose) in adult sheep to cause clinical disease later, around lambing time.

![Fig 7 Incidents of Haemonchus for GB for quarter 3, as a % of diagnosable submissions 2005-2017](image)

**Systemic**

Both *maedi visna* (MV) and *caseous lymphadenitis* (CLA) were identified in a pedigree Suffolk ewe, which was submitted for post mortem after failing the MV accreditation screening test twice. Although there were no grossly visible lesions suspicious of MV, four large lung abscesses containing green lamellated caseous purulent material yielded *Corynebacterium pseudotuberculosis*, the causative agent of CLA. Histopathology of the udder tissue identified multifocal, chronic, lymphocytic mastitis, consistent with a diagnosis of MV. Visceral CLA is relatively unusual in the UK, and in this case a concurrent clinical MV infection was likely to have accentuated the CLA lesions. This case illustrates the potential significance of endemic MV on the occurrence and impact of other diseases in an infected flock, including potentially zoonotic diseases.

**Salmonella**

The report on *Salmonella* in livestock production in Great Britain which provides data on reports of *Salmonella* in livestock, birds and wildlife in Great Britain during 2016 has been published on Gov.uk (link below)

Headlines from this report:

- A total of 107 *Salmonella* isolations from sheep in 2016 represented a 62.1% increase when compared to 66 isolations in 2015, and was more comparable to 2012 and 2013 (100 isolations and 112 isolations, respectively).
- During 2016, the three most common *Salmonella* serovars in sheep were *Salmonella* 61:k:1,5,(7), S. Montevideo and S. Dublin.
- There was a marked increase to ten isolations of *Salmonella* Typhimurium in sheep during 2016, compared with none in 2015 and three in 2014.
A single *Salmonella* isolate, S. Coeln, was recorded from a goat in 2016, with clinical signs of diarrhoea and wasting. This is the first report of this serovar from goats in GB. *Salmonella* Coeln has been previously associated with imported feed ingredients.

The full report can be found via this link:

**High mortality due to Salmonella in a sheep flock**

Significant losses occurred following an outbreak of salmonellosis in a group of 400 draft hill ewes. They had been weaned, transported to markets in the Scottish borders and then moved 250 miles south for finishing. On arrival at the farm the sheep were placed into a holding field. Following sorting the next day they were moved to another field where a stream was the only water source. Three days later heavy rain ensued. Over the next few days 40 sheep died following a short period of recumbency and dullness. The practitioner was called to investigate.

Postmortem examination (PME) and blood sampling identified multiple issues including enteritis, high urea and borderline magnesium results. Terminal diarrhoea was observed. Losses continued at an increasing rate so four sheep were sent for PME at the Royal Veterinary College. Findings included distal oesophageal erosions with diphtheritic membrane formation, watery, green rumen and intestinal contents with reddening of the mucosa, enlarged mesenteric lymph nodes and pale enlarged kidneys.

An investigative farm visit was carried out by a Veterinary Investigation Officer (VIO) from APHA Shrewsbury VIC. Selective cultures from multiple samples yielded *Salmonella* Typhimurium (not DT104) and sequencing is in progress to characterise the strain more fully.

In total 50 per cent of the group died. The stressors of weaning, mixing, transport, diet change, inclement weather and potentially reduced water intakes were all thought to have contributed to the severity of the outbreak, and colleagues are reminded to be aware of. Spread within the group probably occurred during transport as other groups on the holding were not affected initially. A similar mortality was described in the 1980s in New Zealand due to *Salmonella* Havana (Hemmingsen and others 1982).

**Toxicity**

**Poisoning in ewes after access to an iron-based compound**

Forty-four yearling ewes were purchased in early August and put out to grass with 86 older resident ewes. They were all all moved at the end of August to a field of grass adjacent to approximately 15 acres of wheat stubble. The cultivated area had been rented out for strawberry production for the previous four years. Wheat was subsequently sown and had recently been harvested. Four days following the move into the adjacent pasture, 16 ewes were found dead overnight and several others appeared stiff and weak and had black diarrhoea. The electric fence keeping the sheep off the stubble field had been knocked down and the flock had gained access.
The group was immediately moved to another field and two carcases were quickly submitted to APHA Shrewsbury VIC for PME. Severe haemorrhagic gastroenteritis was present with no immediate cause identified. A further nine ewes died over the weekend and two more casualties were submitted for PME with black faecal staining of the hindquarters evident. Both also had severe haemorrhagic enteritis, a strong smell of ammonia in the abomasum. There were no excessive quantities of cereal grain in the forestomachs to suggest cereal overload. A visit was made to the farm by an APHAVIO. The owner described how, when the ewes had broken through the electric fence, they apparently had eaten the contents of an unmarked 25kg bag of what was originally thought to be sand for an irrigation filtration system. Examination of the remaining contents of the bag revealed relatively fine granules of light-brown material. The possibility then arose that the bag may have contained an iron-based compound which can be used to control slugs on edible plants and crops. The ewes had also had access to black nightshade (Solanum nigrum), a potentially toxic plant, but there was no evidence that significant quantities had been eaten.

Histopathological examination of kidney identified lesions within the proximal convoluted tubules indicative of either an acute haemorrhage/hypovolaemia secondary to severe hypoperfusion (hypovolemic shock), or a toxic insult associated with a possible nephrotoxicant. Blood biochemistry of an affected ewe showed a serum creatinine level of 973 µmol/l (reference interval 0-150 µmol/l) and serum urea of 112 mmol/l (reference interval 4-8mmol/l), consistent with renal failure.

Laboratory testing of the remaining granular material from the plastic sack confirmed high iron content confirming a diagnosis of iron toxicity which led to acute renal failure and death. Forty-three out 130 ewes died over a period of ten days.

The farmer agreed to restrict the sheep for 28 days precautionary withdrawal period to protect the food chain, although these breeding ewes were not intended to be presented to the food chain at the time.

- **Urea toxicity** was diagnosed where mouth frothing and death or sudden death had occurred in six ewes after having been brought in. An old sheep mineral bucket containing lumps of 46% urea fertilizer mixed with rain water was the source. Thirsty sheep after penning for handling was the likely additional predisposing factor.
- **Rhododendron toxicity** was diagnosed in a flock where 4/400 ewes had died within a day and several others were ataxic.
- **Yew toxicity** was diagnosed in a flock where 6/300 ewes had been found dead. The ewes had temporarily been on a restricted acreage, and had consequently broken into a wood that contained yew trees.
- **Copper toxicity** was confirmed as the cause of jaundice and death of one of six adult ewes that had been found dead. The ewes had no current access to concentrates. The excessive copper may have remained in the liver following historical concentrate feeding or supplementation or in some cases a plant source has been a suspected source in these cases.
- **Pieris poisoning** was the suspected cause of death of one of 20 ewes that had died acutely during a 2 month period, while grazing land adjacent to a golf course and houses.
• **Suspect liver toxicity** is still being investigated by Penrith in a group of 340, four to five month old lambs. Photosensitization presenting with head swelling, profound dullness and inappetance were the presenting signs. Post mortem examination revealed pale, enlarged, friable livers. A primary hepatopathy with secondary photosensitisation was confirmed by histology. Liver cobalt levels were normal suggesting “white liver disease” was not involved. Further investigation into possible plant or mycotoxin aetiologies is ongoing.

**TSE**


This consultation is seeking views on updating the rules for the prevention, control and eradication of Transmissible Spongiform Encephalopathies (TSEs). The proposed changes would:

- bring UK law regarding controls on feeding animal protein and handling of Specified Risk Material into line with EU regulations;
- update scrapie compensation rates paid to farmers for sheep and goats;
- transfer the cost of sampling fallen cattle, which require testing for BSE, to the farming industry; and,
- make other minor amendments.

The closing date for comment is 29th December 2017 and the consultation can be accessed at the link below.


**Bovine TB in non-bovine species**


There has been no update since the last quarterly report. However investigations are ongoing into suspected Tb in goats and culture results are pending.

**Antimicrobial resistance**

Following the news that sales of antibiotics to treat and prevent disease in UK farm livestock have achieved a record low following a 27% reduction over the past two years, targets for further reducing, refining or replacing antibiotic use across the key livestock sectors have been announced by The Responsible Use of Medicines in Agriculture (RUMA).

HORIZON SCANNING

International Disease Monitoring
Bluetongue

- France has continued to report findings of BTV-8 in cattle through their surveillance; very few cases have been associated with clinical signs
- Switzerland has reported two cases in two regions, through their own surveillance system, most likely as a result of vector spread from nearby regions in France.
- There have been no further cases reported along the northern French coast so the GB risk level remains LOW
- The recent cases of PCR positive cattle entering the UK from a region in France with high virus circulation is a timely reminder of the importance of safe sourcing of animals and vaccinating the receiving herd to prevent any onward transmission.
- These cases do not mean that disease has been confirmed in UK cattle although the receiving herds are now under restriction while we carry out surveillance.

The UK's Chief Veterinary Officer has urged farmers to remain vigilant for signs of bluetongue virus after the disease was successfully picked up in a number of cattle imported from France through our robust post-import testing regime. The Animal and Plant Health Agency (APHA) identified the disease in cattle after they were brought to Preston and Kendal in England and 2 locations in Scotland. A total of 32 animals came from the same assembly centre in France, in an area where multiple cases of bluetongue have been confirmed since September [2017].

Action is being taken to ensure there is no spread of the disease including installation of midge traps around the farms. The affected animals have been dealt with under the Trade in Animals and Related Products regulations. Cattle with a high risk of being infected with the BTV-8 strain of bluetongue or which had not been vaccinated before being exported will be humanely culled. Farmers will have the option to send those animals without fully compliant paperwork back to France or to cull them to reduce the risk of disease spreading to susceptible UK livestock.

Movement restrictions will be in place on the premises for several weeks until testing rules out spread via local midges.

Strict rules on the movement of livestock from regions affected by bluetongue are already in place. Farmers are reminded that animals from these regions must be accompanied by the relevant paperwork to clearly show they meet certain conditions designed to reduce disease risk, such as correct vaccination.

The UK remains officially bluetongue-free and exports are not affected. The last outbreak occurred in the South of England in 2007. Compensation is not paid for any imported animals culled under the Trade in Animals and Related Products regulations.

Signs of the disease include eye and nasal discharge, drooling, swelling around the head or mouth, lethargy, and lameness. Bluetongue is a notifiable disease and any suspicions must be reported immediately to the APHA on 03000 200 301 (England), 0300 303 8268 (Wales) and regional Field Services Offices in Scotland (<https://goo.gl/rgsdDT>), or to DAERA [Department of Agriculture, Environment and Rural Affairs] in Northern Ireland on 0300 200 7840.
The entire territory of mainland France, excluding the department of Côtes-d'Armor (in the extreme west of Brittany) and the western part of the adjacent department of Finistère, is regarded, according to EC provisions, as "regulated" in relation to BTV-8.

The current situation on France (as of 12/10/2017) is shown in the map below Fig 8

- Notifications of BTV8 between July 2016 and May 2017
- Notifications of BTV8 since 24/05/2017
- Notifications of BTV4 since Jan 2017 (Corsica)

Fig 8 BTV reports in France

Diagnostic submission trend

Throughput

<table>
<thead>
<tr>
<th>SHEEP</th>
<th>Non Carcase Submissions</th>
<th>Carcase Submissions</th>
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<tbody>
<tr>
<td></td>
<td>Jul-Sept</td>
<td>APHA</td>
</tr>
<tr>
<td>2017</td>
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<td>320</td>
</tr>
<tr>
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<td>689</td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td>679</td>
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</table>
Carcase submissions to APHA (including PPP) are increasing for sheep and reducing for goats comparable to previous years however non-carcase submission numbers are significantly reduced for APHA which is likely to be a reflection that more samples are being handled by external laboratories. SAC non carcase submissions are in general increasing.

**Throughput Maps**

The map Fig 9 shows the geographical spread of submissions received from small ruminants for Q1 – Q3 2017.

These maps have 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 achieved in England and Wales by scanning surveillance activities. The map provides a spatial representation of the distribution of submissions, by holding, to the diagnostic service network, including APHA laboratories, submissions from holdings in England and Wales to SAC-CVS and to the partner providers of postmortem examinations. The maps also include other components of early warning surveillance: notifications of welfare complaints investigated by the Field Service and clinical report cases of exotic disease suspects handled by VENDU.

The surveillance rate for each species is the proportion of holdings that submitted **at least one** carcase or diagnostic sample or had at least one of the other alert types in the reference period over all holdings of that species in the spatial unit (hexagon).
Fig 9 Percentage of sheep holdings alerts in Q1 2017, expressed as equal-sized hexagons

Publications of interest

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

Lacroux C; Cassard H; SIMMONS H; Douet JY; Corbiere F; Lugan S; Costes P; Aron N; Huor A; Tillier C; Schelcher F; Andreoletti O 2017
Classical scrapie transmission in ARR/ARR genotype sheep.  

PAYNE J  2017  
A field approach to suspected poisoning in cattle and sheep.  
Cattle Practice 25 (2) 111-112.

Wall BA; ARNOLD ME; Radia D; Gilbert DRW; ORTIZ-PELAEZ A; Stark KD; Van Klink E; Guitian J  2017  
Evidence for more cost-effective surveillance options for bovine spongiform encephalopathy (BSE) and scrapie in Great Britain.  
Eurosurveillance 22 (32) 30594.

Wessels M; Strugnell B; Woodger N; Peat M; LA ROCC SA; DASTJERDI A  2017  
Systemic necrotizing polyarteritis in three weaned lambs from one flock.  
Journal of Veterinary Diagnostic Investigation 29 (5) 733-737.

Other publications of interest


References
