INTRODUCTION

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, 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.
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, 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 cattle 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](http://ahvla.defra.gov.uk/vet-gateway/surveillance/index.htm).

**OVERVIEW**

**Issues and Trends**

**Weather**

![Weather Map](image)

**Fig1:** Rainfall (left) and sunshine (right) as % of the average for 1981-2010 for the period June-August 2017

The trend towards warmer but dryer springs could impact on silage production leading to high quality but lower yields of first cut silage and possibly poorer germination of spring planted forage crops such as maize, was reported in the Q2 report. The summer period (June- August) had lower than average sunshine especially to the west and north, and significantly wetter weather. These coalesced in parts of western Scotland in particular, at times coinciding with forage harvesting. SAC reports poorer forage both in terms of quality and quantity which could impact on cattle health and welfare.
**Beef**

A snapshot of the GB beef herd showed a year on year increase of around 1% for beef cattle under 30 months of age. There have been fewer cattle (especially bulls) going to slaughter, and carcase weights are reduced, so total yield is lower than previous years.

Prices have generally remained very good. Average prime cattle prices continued to rise through July (they had been rising since April) and hit a three year high in late August, 24p/kg above the previous year. The market started to turn slightly in mid-September, and really started dropping into early October, narrowing the gap against last year to 15p.

**Dairy**

Milk prices have continued to rise through the autumn and milk output for the year is increased compared to the same period in 2016 as some producers increase production in response to price increases. This may signal a plateau in milk price into 2018. For now, the main challenge for the winter will come from variable forage quality and availability, particularly in the north of the UK with some farmers reporting bumper forage harvests and others not having enough to last the winter. Cereals and straw availability and quality have also been significantly compromised in the north of the UK. On farms where cattle graze, milking cattle have been housed early and this will increase the potential disease risk and pressure on forage reserves. Given the higher milk price veterinary involvement in such issues is likely to be significant which increases UK surveillance opportunities.

**Diagnostic submission trends**

![Graph showing diagnostic submission trends from 2012 to 2017.](image-url)
Fig 2: Cattle carcass throughputs and diagnostic analysis, Q3 2017: APHA (top), SAC (middle), Partners (bottom)

Fig 2 illustrates a small increase in carcasses submitted to APHA compared with the preceding three years, and maintenance of those submitted to partner PME providers. Although these are welcome trends, it is the intention that free carcass collection should significantly increase the submission of carcasses in those areas, and colleagues are reminded of the availability of this service. The east of England continues to be relatively poorly represented. This will continue to be monitored by the Cattle Expert Group (CEG).
Fig 3: Submissions from cattle holdings expressed as % in England and Wales

The map at fig 3 shows the geographical spread of submissions received from cattle 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).

Data for Scotland are not currently available. Eastern England is again disproportionately under-represented.

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 SAC-CVS 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 2011-2016 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 infection 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)*

There was no evidence from DNR analysis in Q3 2017 of new and emerging disease in cattle, including analysis by syndrome and presenting sign.

* When a VIDA diagnostic code is assigned to a specific submission, the decision has to be made if it meets the stated diagnostic criteria. If the criteria are not met, it is marked as “Diagnosis Not Reached” or DNR. If it is a DNR, the next step is then to decide if this was due to limited testing or if reasonable testing had been done. If it is deemed that reasonable testing had been done, there may be reasons why a diagnosis could not be reached and this should be recorded and can include inappropriate disease phase, treatment, inconclusive results, or other reasons. Typical examples of such submissions include: coccidiosis cases where speciation was not done and Johne’s cases in live sheep where the test results may be inconclusive. However, in some cases there is no apparent reason to explain why a diagnosis could not be reached and these are the submissions, if present in significant numbers, which may indicate new and emerging disease.

ONGOING NEW AND RE-EMERGING DISEASE INVESTIGATIONS

Schmallenberg update

Following recrudescence of disease in late 2016, APHA has provided free PCR testing for cases which fit the case description for congenital defects typical of SBV (arthrogryposis, spinal defects, hydranencephaly), and of cases suggestive of acute disease in cattle (fever, milk drop, +/- diarrhoea) where reasonable steps have been taken to rule out common differential diagnoses, and after discussion with a VIO. These have been reported on the Vet Gateway at http://ahvla.defra.gov.uk/vet-gateway/schmallenberg/index.htm. The CEG has continued free testing for suspected acute disease, both by means of paired serology (two clotted bloods 3 weeks apart, the acute blood being taken within 5 days of the onset of signs), and PCR on EDTA (purple top) blood samples taken within the same acute time, on a maximum of three animals in each herd. This is to encourage submission of material through the vector active period.

Salmonellosis

Salmonella Typhimurium DT104 can cause significant disease in animals, is zoonotic and can cause severe disease in people. The organism is characterised by having resistance to several antibiotics which are commonly used in farm animal practice, including tetracycline, ampicillin/amoxicillin and streptomycin. The outbreaks have arisen on different farm types including dairy, suckler herds and sheep premises, in addition to two separate cases in horses (APHA 2017a). As a result of the recent cases in Wales APHA has continued to enhance targeted surveillance for Salmonella infection in livestock in order to help understand the current outbreak more fully. Practices in North Wales were invited to sample farm animals showing clinical signs where Salmonella infection could be involved. During August 2017, the APHA’s Salmonella Early Detection System (which models expected cases based on historical incidents with observed cases and provides alerts) flagged higher than expected cases of Salmonella Typhimurium DT104, evidencing ongoing cases of this type. Further epidemiological investigation is under way, including liaison with Public Health agencies, and a further report will be produced in due course.

Salmonella Dublin

A four-year-old cow was submitted for postmortem examination from a herd of 900 animals, with a milking herd of around 450. The herd had lost three adult cows in the previous week. Two of the previous deaths had sudden milk drop and scour prior to death. The herd had also been experiencing up to two abortions per week throughout the summer as well as some pyrexic cows with respiratory signs.
At postmortem examination, the carcase was septicaemic, with diffuse petechiation. Bacteriology of swabs from the liver, lung and spleen grew few colonies of a pure growth of *Salmonella* Dublin. Further faeces samples and placenta also cultured *S.* Dublin.

Investigation revealed that the farmer had recently suffered from a gastrointestinal illness which had been confirmed by their GP to be due to *Salmonella*, and a ZO4 farm visit was initiated.

At the farm visit, potential control strategies were discussed as well as possible sources of the *S.* Dublin infection. The neighbouring farm had also recently suffered an *S.* Dublin outbreak, however there was no direct contact between the cattle, with a double fence in place with a 3m gap between the fences. Additionally 3 staff members worked on farms other than this dairy, although site specific overalls and wellington boots were provided to try to mitigate the risk. Environmental swabs and faecal samples were taken at the visit, covering various parts of the farm to identify high risk areas where extra biosecurity measures would be most beneficial.

**UNUSUAL DIAGNOSES**

**Hypotrichosis**

Hypotrichosis was diagnosed at APHA Carmarthen VIC, by histopathological examination of skin biopsies from two 6-week-old suckled Simmental calves from a group of 30. The calves were reported to have asymmetrical alopecia over the legs, body and head as well as mild erythema (fig 4). Histopathology identified small hair follicles with no larger guard hairs follicles present. Some follicles were in anagen and there were small amounts of inflammatory material within hair follicles. This appearance was consistent with hypotrichosis; possible underlying causes include BVD infection, hypothyroidism and congenital/genetic causes although BVD infection was ruled out by laboratory testing. Vitamin C responsive dermatosis can produce a similar clinical picture although no typical distorted curlicue follicles were detected in this case. Hypotrichosis has been identified in many breeds of cattle, and has a wide variety of presentations and prognoses. It has been shown to be inherited in different breeds and may be a recessive and dominant trait. Investigation into the breeding of these calves was recommended including identifying any evidence of inbreeding.
Summer scour syndrome- a novel condition?

A problem with ill-thrift and scour in weaned calves on a 9500 Litres /lactation dairy prompted the submission of one 9-month-old heifer for post-mortem examination (PME) at the University of Bristol. Two groups of weaned animals had shown unresolving scour and subsequent ill-thrift at grass. Treatment for worms (moxidectin) and coccidiosis (no laboratory evidence for either) and fluke (triclabendazole) and oxytetracycline had no effect and at least eight had been euthanased. Copper deficiency had been excluded. At PME the main post-mortem findings included ulceration in the mouth (fig 5), abomasal fold oedema and watery intestinal content (fig 6) and mild chronic pneumonia in the right cranial lobe. A marked leukopaenia was detected (WBC 0.7 x 10^9, reference range 4-10). Testing (parasitology, BVD antigen, copper) was unrewarding.

This presentation has similarities with “Summer Scour syndrome” – outbreaks of scour in weaned dairy calves often associated with alimentary tract ulceration – that SAC is currently
investigating in Scotland, but the cause is uncertain. It differs grossly and histologically from Idiopathic Necrotic Enteritis, a syndrome more commonly seen in beef calves.

A similar syndrome in Australia also being investigated, Upper Alimentary Ulcerative Syndrome (http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/animal-diseases/vetsource/upperalimentary-ulcerative-syndrome). An epitheliotropic virus is suspected in Australia – certainly in some cases Bovine Papular Stomatitis infection is present, but the lesions are too extensive for this virus to be acting in isolation.

The APHA Cattle Expert Group would be interested to hear similar outbreaks of scour and associated ill-thrift in dairy calves, where the common causes of scour including coccidiosis, salmonellosis and worms have been excluded, and testing for copper deficiency and BVD has been unrewarding.

**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.

**Parasitic gastroenteritis**

There has been an increase in PGE diagnoses in Q3 for the past four years, statistically significant concerning APHA submissions but not overall, with all APHA Veterinary Investigation Centres (VICs) and many partner PME providers reporting incidents especially in September (fig 7).

![Fig 7: Parasitic gastroenteritis in Q3: % of submissions diagnosed (top) and incidents as % of diagnosable submissions (bottom)](image-url)
A typical case was investigated at APHA Shrewsbury VIC by postmortem examination of a 15-month-old dairy heifer, one of three in a group of 25 which were found dead. Two others were reported to be off colour and separated from the remainder of the group. Most of the animals were turned out only one month previously and had not grazed previously. The animal was severely dehydrated and there was reduced rumen content, but most noteworthy was the severe mucosal gland hyperplasia and ulceration within the abomasum (fig 8). Parasitological examination confirmed 81,000 *Ostertagia ostertagi* within the content and there was a count of 2550 trichostrongyle eggs per gram in soft faeces.

![Image](image-url)

**Fig 8: Mucosal gland hyperplasia in abomasum of heifer with ostertagiosis**

This upward trend will be monitored, and awareness has been raised through the monthly surveillance report in the Veterinary Record (APHA 2017b).

**Psoroptic mange**

A flying dairy herd in west Wales was diagnosed with psoroptic mange, the first documented case in Wales since 2014. A likely source of infection was animals purchased from countries in Europe. Colleagues are reminded to be aware of this condition particularly when pruritic skin lesions are seen that are poorly responsive to treatment.

**Johnes disease**

A statistically significant increase in the % of diagnosable submissions to SAC (but not overall) resulting in a diagnosis of Johne’s disease has been seen in Q3 of 2017 compared to the same quarter of 2016 (fig 9). This may be related to better awareness of the condition amongst farmers, or possibly cows in poorer body condition as a result of the poorer weather (see above) triggering further investigation. There will be ongoing monitoring of the data to determine whether this is an ongoing trend.
Bluetongue

The UK’s Chief Veterinary Officer has urged farmers to remain vigilant for signs of bluetongue virus after the disease was successfully identified 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. 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 have been humanely culled. Farmers 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.

BTV-8 was reported in two cantons in Switzerland in November 2017.

BTV-4 has also been reported in the Haute-Savoie Département of mainland France.

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:

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

Vaccine against BTV-8 is currently available, and the option to vaccinate should be discussed with individual farmers.
REFERENCES
