GB cattle quarterly report
Disease surveillance and emerging threats
Volume 22: Q4 – October- December 2018

Highlights

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Introduction and overview

This quarterly report reviews disease trends and disease threats for the fourth quarter of 2018, October-December. It contains analyses carried out on disease data gathered from APHA, SRUC Veterinary Services division of Scotland’s Rural College (SRUC) and partner post mortem providers and intelligence gathered through the Cattle Expert networks. In addition, links to other sources of information including reports from other parts of the APHA and Defra agencies are included. A full explanation of how data is analysed is provided in the annexe available on GOV.UK https://www.gov.uk/government/publications/information-on-data-analysis

Issues and trends

Weather

The year

2018 was another warm year - the 7th warmest recorded since 1910. It is worth noting that all of the top 10 mean yearly temperatures have occurred in the 21st century. UK rainfall was 92% of the 1981-2010 average although some areas were significantly less than this and it was clearly a sunny year (fig 1).
Fig 1: Mean temperature (left), rainfall amount (right) and sunshine duration (bottom) for 2018 expressed as mean and % of the 1981-2010 anomaly/% (Met Office)

The annual figures only enable a partial understanding of the impact on the livestock industry. Hot dry weather coincided with the grass forage harvest period in early summer, leading to silage and hay of generally good quality but low volume, and grazed grass was similarly markedly affected. This led to concerns about forage stocks going into winter 2018/19, and the Cattle Expert Group raised this to the Veterinary Risk Group and produced an information note (see http://apha.defra.gov.uk/documents/surveillance/diseases/winter18-forage-shortage.pdf). There was recovery in the later summer with improved grazing and some later cuts of forage. The autumn period was relatively mild, allowing animals to be grazed out for longer in some areas, and the maize harvest was generally good, all of which reduced the potential impact of reduced conserved forage in the summer.

Q4

The winter period 2018/19 has, at the time of publication, been dryer in northern and eastern areas and mean temperatures have been typical for the time of year (fig 2). However, there have been some reports of impacts of reduced forage from the preceding summer:

- Some farms have increased involuntary culling to reduce cow numbers.
- In some areas, farms are starting to use forage from previous years which is of poor quality. This is leading to digestive problems (subacute ruminal acidosis, displaced abomasum) in some herds in the southwest of England.
- There have been a number of reports of ergotism (northeastern Scotland) and mycotoxin related herd problems

The overall impact has been relatively mild, although a prolonged winter housing period could magnify the issues greatly. A late turnout will eat into any reserves, and the weather in March will be critical.

![Maps showing winter temperature and rainfall](image)

**Fig 2:** Mean temperature (left) and % rainfall (right) winter 2018 expressed as relative to the 1981-2010 anomaly/% (Met Office)

**Dairy**

Farm gate milk prices were maintaining a slight downward trend at the start of 2019 with prices in the range between 27.0ppL and 32.8ppL with some supermarket aligned contracts seeing price increases.

In general input costs and in particular feed prices remain high and this will maintain economic pressure on farm businesses. Forage stocks, particularly in England, are likely to be low on some farms, with many farmers hoping for an early spring with good grass growth. Milk output remains higher than the same period in 2017-18.

**Beef**

Cattle coming off grass in the autumn typically lead to downward pressure on price, and this was seen as expected. There is usually a price lift in November, however, in the run
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up to the ‘Christmas kill’, but unfortunately this did not happen in 2018 (possibly as a result of too many coming forward). As a result, prices kept dropping consistently over the quarter, and having started 3-4% above 5 year averages, they ended 2-3% below them.

Cattle population estimates suggest that short term beef supply is likely to be stable over the coming months, but there are reports of significant reductions in young beef calves being registered during 2018 (1.3%, 3% and 4% reductions in England, Scotland and Wales respectively). It is interesting to note that native breed sired calves increased and the major drops are in continental sired calves. With less male dairy births also recorded, supply could be limited until 2020-2021.

There were some estimates of the extent of forage shortages in market reports during the quarter, with significant (~20%) reduction in silage stocks in some areas.

New and re-emerging diseases and threats

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

Analysis of Diagnosis Not Reached (DNR)*

No significant changes in Diagnoses Not Reached were detected during Q4 2018.

Unusual diagnoses

Myocardial necrosis, polioencephalopathy and nephritis in suckler calves

Three of a group of 40 suckler calves aged approximately 10 weeks, in a Cumbrian herd of 240 animals, which were at pasture with their dams, were reported to develop intermittent diarrhoea which did not improve with attempted antibiotic treatment and rehydration therapy. The three calves died, the third being submitted for postmortem examination. The calf was severely dehydrated. There were small ulcers inside the lips and on the dental pad (fig 5). Irregular pale areas were present within the wall of the left ventricle and the interventricular septum (fig 3). The kidneys were also pale (fig 4) and the urea concentration in aqueous humour was 96.1 mmol/l, indicating uraemia. There were no significant bacterial isolates and no worm eggs in faeces. Pestivirus PCR was negative. Biochemical analysis of the liver copper and selenium concentrations did not indicate trace element deficiency. Histopathology confirmed marked multifocal acute myocardial degeneration and necrosis and a moderate multifocal chronic-active tubulointerstitial nephritis. Examination of the brain indicated a moderate multifocal subacute necrotising polioencephalopathy. It was concluded that the brain pathology was probably not severe.
enough to have resulted in the calf’s death. The distribution of the lesions ruled out a toxic or metabolic aetiology, and were not those seen with infectious causes, instead being more likely due to ischaemic injury. The renal lesions were consistent with previous bacteraemic showering, which in younger calves may be seen grossly as ‘white spotted kidneys’, and would have contributed to the terminal uraemia. The heart lesions were the most recent although their cause was uncertain, not being typical of those seen with ‘white muscle disease’.

**Fig 3:** Myocardial necrosis (pallor) in interventricular septum  **Fig 4:** Pallor in kidneys

**Fig 5:** Small ulcers on mucosa and dental pad

**Reticuloruminal impaction**

APHA Penrith Veterinary Investigation Centre (VIC) investigated the deaths of housed cattle on a fattening unit. The carcase of a 613 kg bull was received for postmortem
examination, being the fourth animal to die in a group of 50. The group was being fed a diet of straw and molasses, with water sourced from a spring. The carcase was in poor condition with no body fat, and oedema in some of the muscle groups. A heavy infestation of *Bovicola* sp. biting lice was identified. The reticulum was markedly enlarged, measuring in excess of 100 cm diameter. The reticulum wall had multiple areas of full thickness necrosis from where the feed material and fluid had escaped, and the omentum was inflamed. The rumen was also distended, both organs containing dry long-stalk straw contents mixed with other fibrous material and a few barley grains. There was similar ingesta within the abomasum and very little content in the intestines. The findings indicated that death was due to peritonitis following ruminoreticular impaction.

The underlying problem which led to the stomachs becoming impacted was likely to be the diet of low digestibility straw with insufficient effective rumen degradable protein (ERDP), possibly contributed to by a shortage of water.

Although cows are able to utilise straw as a principal feed it requires suitable dietary supplementation to enable the cows to utilise it effectively, especially ERDP, ensuring production of sufficient rumen microbial protein to maintain rumen health. The diet was also likely to be deficient in minerals and vitamins eg Vitamin A. An urgent review of the animals’ diet was advised, in addition to ensuring adequate access to clean water and treating the louse infestation. Other similar cases were identified on farms during last year’s winter period when there was a lack of good quality forage following the poor autumn weather in 2017. There is the potential for some forage shortage in winter 2018-19 and the Cattle Expert Group has produced an information note (see above).


### Intestinal obstruction caused by caustic soda

Postmortem examination of a five-year-old cow was undertaken, being the sixth death reported in a Warwickshire herd of 250 cows. The farmer had reported that the animal had exhibited weight loss and a lack of energy before it died. At postmortem examination the intestine was found to be distended proximal to a large mass of semi-solid white to cream granular material. The abomasum was also dilated with watery content. Enquiries with the farmer revealed that he had had problems with clumping of the caustic soda which was added to the maize silage, which confirmed the identity of the substance that had caused intestinal obstruction. Complications can occur with the use of caustic soda if it is not evenly mixed when making silage. A previous investigation on another dairy farm identified tongue/oral ulceration which had been caused by clumping of the caustic soda.
BVD-associated thrombocytopenia

A yearling heifer was reported with haemorrhagic diarrhoea in addition to bleeding from its nose and from insect bites on its skin. A BVD antigen ELISA was positive indicating BVD viraemia (and most likely persistent infection). The clinical signs were considered to be caused by disseminated intravascular coagulation (DIC) and thrombocytopenia associated with the onset of mucosal disease. The BVD virus was identified as BVDv type 1. BVDv type 2, which has not been identified in the UK since 2007, and is more common in North America, is more commonly associated with thrombocytopenia.

Pathology similar to Severe Summer Scour Syndrome in housed calves

A five-month-old dairy heifer calf was euthanased to investigate scour and weight loss. It was in a group of 30 animals which were previously outdoors but housed one month prior to submission with access to hay and pelleted feed containing decoquinate. The animals were in a herd of 150 milking cows which was vaccinated against BVD, and the submitted calf had previously tested negative for BVD virus. The postmortem examination revealed marked thickening of approximately 80% of the oesophageal mucosa which was overlain by a thick, foul-smelling, necrotic, plaque-like membrane. There were also ulcerative lesions on the tongue and at the junction of the oesophagus with the rumen (cardia). The remainder of the gastrointestinal tract was grossly unremarkable. Tests for Salmonella, coccidiosis, parasitic gastroenteritis and Malignant Catarrhal Fever were all negative and no significant bacteria were identified by aerobic or anaerobic culture. Histopathology confirmed a severe, ulcerative, fibronecrotic oesophagitis associated with chronic bacterial infection; many gram negative slender filamentous bacilli resembling Fusobacterium necrophorum were associated with the lesions. The underlying primary cause of the pathology was uncertain; calf diphtheria (infection by F. necrophorum) usually causes more localised lesions of the pharyngeal area, rather than the more extensive lesions identified in this case which resembled those of calves with Severe Summer Scour Syndrome, some of which have presented with oral and oesophageal ulceration and necrosis.

Multiple congenital cardiac abnormalities

Congenital cardiac abnormalities were identified postmortem in two Holstein calves in a south Wales dairy herd of 650 animals. The calves had been weak from birth and were unwilling to suck, one of the calves having been fed by stomach tube since its birth. They were slow to grow and exhibited increased respiratory rates. Clinical examination of one of the calves which was presented alive revealed a loud bilateral heart murmur, a heart rate of 140 beats per minute, a palpable ‘thrill’, increased respiratory rate and pale mucous membranes.

Postmortem examination of the two animals revealed similar pathology with a ventricular septal defect, persistent truncus arteriosus (a common arterial trunk instead of separate
aorta and pulmonary artery), patent foramen ovale and right ventricular hypertrophy. In addition there was generalised pulmonary oedema, enlargement of the liver and oedema within the connective tissues of abdomen, findings consistent with congestive heart failure. Seven more affected calves were also identified in the herd, each having consistent clinical signs, one having been examined postmortem by the practitioner who reported similar pathology to those examined at APHA Carmarthen VIC.

Each of the calves has the same sire by artificial insemination, an American Holstein bull. There is another report of other progeny of this bull having had congenital cardiac abnormalities. The pathological findings in the calves examined postmortem, and history of congenital cardiac abnormalities in other related progeny from the same bull, suggest a heritable condition in Holstein cattle. The Cattle Expert Group is interested to hear from practitioners of similar multiple cases on other farms.

**Changes in disease patterns and risk factors**

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

**Enteric system**

**Johne’s Disease**

There was a statistically significant decrease in diagnostic rate for Johne’s disease during 2018 compared to 2017 for APHA submissions (ie from England and Wales. Figures from SRUC submissions did not show a statistical change. The decrease in diagnostic rate is likely to be due to the change in ELISA test kit used by APHA, during Q4 of 2017, to one made by a different manufacturer and known to be of lower sensitivity. This change was made due to manufacturing problems experienced by the manufacturer of the kit previously used.
Severe PGE including ostertagiosis

September to November 2018 saw some severe parasitic gastro-enteritis problems, including ostertagiosis. Such outbreaks were predicted following the very dry warm summer in which worm challenge for young grazing cattle would have been minimal, resulting in poor immunity.

Suspect benzimidazole resistance in Ostertagia ostertagi was detected in 5-month-old dairy steer that had been turned out to grass 7 weeks previously. An anthelmintic bolus containing benzimidazole had been administered at turnout. Clinical signs of malaise, inappetance and weight loss were noted in calves in the group three weeks prior to the euthanasia and submission for post mortem of the worst affected animal.

At post mortem examination, emaciation and enteritis were seen. Abomasal nodules suggestive of ostertagiosis were present. Total worm counting of gastrointestinal washes detected 2400 Ostertagia sp., 4300 Trichostrongylus axei and 3000 immature worms in the abomasum and 300 Trichostrongylus sp. worms in the small intestine. Faecal egg counting detected 50 Trichostrongyle-type eggs per gram of faeces and 42450 coccidial oocysts per gram, 90% of which were speciated as Eimeria bovis and 10% as Eimeria alabamensis. At 5 months, the calf was considered to be beyond the main risk period for disease due to E. bovis; the high oocyst count may have been secondary to debilitation. E. alabamensis can cause disease in older animals at grass.

Worm egg counts from others in the group detected variable worm egg counts ranging from <10 epg to 900 (Trichostrongyle-type) epg. Eggs were sent to Moredun Research Institute for further investigation including a controlled efficacy trial. Although work is continuing, early results show reduced efficacy to benzimidazole in Ostertagia ostertagi.
Benzimidazole resistance in other nematode species has been shown to be caused by a mutation in a single nucleotide and molecular testing will also be undertaken in this case.

**Respiratory system**

*Mycoplasma bovis pneumonia*

An increase was noted in Q4 in the percentage of diagnosable submissions of diagnoses of *Mycoplasma bovis*. The percentage of diagnosable submissions across GB has grown over the years and it was at its high in Q4 of 2018 (fig. 7). This correlates with an overall increase in the percentage of submissions tested over the years. It is likely that awareness of this pathogen being involved in respiratory disease has led to an increase in tests requested/ performed. However, despite decreases in the percentage of submissions tested, increases in the percentage of submissions diagnosed have still been seen, as was the case in Q4 of 2018 compared to the previous year. This reinforces the understanding that *Mycoplasma bovis* is endemic in UK cattle herds.

![Fig 7: Incidents of M. bovis in Cattle as % of diagnosable submissions in Q4](image)

**Reproductive and mammary system**

*BVD in lambs and cattle on a mixed farm*

BVD virus was detected by PCR undertaken at APHA Penrith VIC in lambs as a cause of late abortions and the birth of small non-viable lambs in a flock of 100 ewes in March 2018. Pestivirus antibody was detected in a number of dams. Later 15-20 lambs were born with brachygna-thia. The BVD virus detected in lambs was later typed as 1a at the Moredun Research Institute.

Seven BVD Persistently Infected (PI) cattle were known to be on the holding and attempts were made to type the virus in the cattle. Only two of the seven were able to be typed. One had BVD 1a and one had BVD 1b but the 1a was sufficiently different to not be considered the source of the 1a in the lambs. Thus the cattle could not be confirmed as the source, but could not definitely be discounted.
The lambs to be kept as ewe lamb replacements were tested for virus, to ensure that no PI sheep were retained. The remainder were to be sold fat. The PI cattle were slaughtered and the cattle are now vaccinated against BVD. BVD is rarely detected in sheep but it is important to investigate BVD in other species particularly with the progress towards BVD eradication.

**Centre of Expertise for Extensively Managed Livestock**

APHA Carmarthen Veterinary Investigation Centre (VIC) is being developed as a Centre of Expertise for surveillance in extensively managed livestock. Whilst based in Wales, the Centre is a Great Britain-wide resource.

Extensively-managed animals are those that are kept in such a way that they are not easily regularly and closely inspected for signs of ill health, or significantly altered production. The Centre will focus on extensively managed cattle and sheep and has been set up to:

- Develop efficient ways of sourcing relevant animal health data and information on extensively managed livestock for scanning surveillance.
- Investigate and develop how data and information can be translated into actionable intelligence and disseminated to extensively managed livestock keepers and vets.
- Develop a virtual hub of expertise in scanning surveillance of extensively managed livestock to complement the APHA [Species Expert Groups](http://apha.defra.gov.uk/vet-gateway/surveillance/experts/exten-man-livestock.htm).

The development of this Centre will progress over a number of years and is one of a number of projects underway to develop scanning surveillance further. Further information is available on the APHA Vet Gateway: [http://apha.defra.gov.uk/vet-gateway/surveillance/experts/exten-man-livestock.htm](http://apha.defra.gov.uk/vet-gateway/surveillance/experts/exten-man-livestock.htm)

**Horizon scanning**

**Bluetongue (BTV) update**

Bluetongue (BTV) serotype 8 in cattle was reported in Germany in December. This is in addition to BTV 8 known to be present in France and Switzerland. The most recent assessment for Bluetongue (BTV) in Germany can be found at [https://www.gov.uk/government/publications/bluetongue-virus-in-europe](https://www.gov.uk/government/publications/bluetongue-virus-in-europe)
Vaccination of cattle against BTV has been recommended in Germany since February 2016 on a voluntary basis, because of the BTV cases in neighbouring France and Switzerland. Vaccination is not mandatory in Germany as it is in France and Switzerland and according to the Competent Authority only about 25% vaccine coverage has been achieved, which is not sufficient to give sufficient herd protection to prevent outbreaks. For this purpose, at least 80% of susceptible animals must be vaccinated. Animals that have been vaccinated against BTV-8 are protected against reinfection. Duration of protection is limited, in some cases to one year, dependent on vaccine used.

The current BTV-8 strain has appeared to be less virulent than the virus which circulated in Northern Europe from 2006, as there have been many reports of subclinical infection in France and Switzerland this year. However, there are reports from Switzerland indicating higher levels of virulence in sheep (including some deaths), and recent reports of congenital disease (‘dummy’ calves with blindness and hydranencephaly) possibly associated with BTV-8 in calves from France. Any suspicion of congenital (or acute) disease in which BTV cannot be ruled out must be reported to APHA.

Since 19 September 2018 to 19\textsuperscript{th} December 2018, TRACES has reported certificates for 37 consignments of live bovines being imported into the UK from Germany. This is a total of 750 live animals.

In September and December post import testing identified BTV in imported cattle in the UK. In both incidents the affected cattle were killed and no compensation was paid. Surveillance was carried out and no spread of BTV was found. Advice from the APHA
Species Expert Groups and the livestock industry highlight to livestock owners that they should source animals responsibly by working with their private veterinarians and livestock dealers to make sure animals are correctly vaccinated and protected prior to travel. This means that animals must be correctly vaccinated against BTV-4 and/or BTV-8 or be naturally immune to both virus serotypes, prior to leaving the Restriction Zone.

In view of the latest disease intelligence, unsuitable weather in France, Germany and Switzerland, the reduced midge activity at this time of year and poor virus replication rates, the risk the UK remains low. The CEG will continue to keep this under review.
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