GB Emerging Threats Quarterly Report
Cattle Diseases


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Highlights

- Hereditary neuraxial oedema of Hereford cattle                         | 6    |
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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 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 SAC C VS. 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, Wales Veterinary Science Centre) from samples submitted in the second quarter of 2015 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**

April and June were both warmer and drier than average except in the north and west of Scotland, May was significantly cooler:

![Mean temperature shown as difference from previous years, April and May 2015](image)

**Fig 1: Mean temperature shown as difference from previous years, April and May 2015**

These temperatures will have impacted on forage quality and quantity, combined with reduced sunshine hours to the north and west of GB resulting in a different picture across the countries: the south and east of England and Scotland are likely to have had high quality but possibly reduced quantities, and parts of the northwest of England and Scotland the reverse.
Dairy

The GB average milk price was 24.42ppl in June, which was a 0.23ppl (1.0%) decrease on the previous month. This was a decrease of 7.62ppl (23.8%) compared with June 2014. Total cash costs of production (12 month rolling to March 2015) were 23.4ppl for the top 25%, and 30.0ppl for the bottom 25%. Provisional UK production in June 2015 amounted to 1,290m litres, up by 49m litres on last year's figure, equivalent to a 3.9% increase. Wholesale dairy markets continued to feel the effects of too much milk with prices falling steadily throughout July. The general tone of the market has been quiet, with buyers only looking for immediate cover and sellers under pressure as stocks build. The strength of Sterling against the Euro is adding further downward pressure to prices.

Prices for replacement heifers and for cull cows have increased slightly compared with 12 months ago with lower fuel prices and generally lower costs of straights meaning farm expenses have reduced; although this mitigates the reduced milk price, dairy farmers are under considerable financial pressure, which could negatively impact disease surveillance through reduction in cash available for disease investigation.

The Milk Market Observatory held a meeting recently to discuss the situation and outlook. The review of the EU and global markets showed a continuation of the imbalance between supply and demand. It concluded improvements in market prospects would only occur when milk production started to decline.

Source: AHDB Dairy, Defra
Beef

Currently, the increased value of sterling has had a negative effect on beef exports, with a decrease of 13% recorded. At the same time there has been an increase in imports of 11%.

An increase in the importation of beef will further reduce the size of the UK beef herd. A year-on-year reduction in the size of the UK beef herd was reported in last year’s Defra June census.

Beef farming groups in the UK have advocated the use of sexed semen in dairy herds in order to improve the supply of animals for the beef market. Inseminating the most productive dairy cows with the semen of high yielding dairy heifer genetics could allow older dairy cows to be inseminated with semen from beef bulls. Average carcase weights have risen by nearly 20 kg over the last 10 years. The quality of carcases has also improved with more carcases reaching the best conformation classification. The proportion of young bulls has continued to decline, whereas the number of steers has increased by 57%. The average deadweight price for steers at the end of this quarter was 344 p/kg.

In summary, financial pressure on many sectors of the agricultural industry including cattle has the potential to reduce the sector’s willingness to invest in disease surveillance.

Diagnostic submission trends

Fig 3: Cattle diagnostic submissions, second quarter by year 2011-2015
It should be noted that beef herds in Scotland are seasonal, with a peak of calves being born in the second quarter, which could contribute to a stronger submission of carcases in this quarter.

There has been a decline in the number and proportion of carcase submissions to APHA compared with SAC C VS from 45% of the total in 2013 to 40% in 2015. All the partner post-mortem (PME) providers to APHA, and the closure of APHA Veterinary Investigation Centres planned as part of Surveillance 2014, were implemented at various times in this quarter apart from the Wales Veterinary Science Centre; although this did not officially open until the end of June 2015, it did contribute during June.

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 C VS was harmonised from 2007. In this report GB data from the third quarter of 2014 is compared with the data from the equivalent quarter in 2013 and has also been compared with pooled data for the five previous years.

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.

Analysis of Diagnosis Not Reached (DNR)*

The Early Detection System did not estimate any increase in DNRs; rather, it estimated three declines. It should be noted that the EDS model is based on static submission numbers rather than declining numbers, which could contribute to the estimates described.

Analysis of DNR by syndrome and presenting sign

Analysis of DNR reports detected a significant increase during Q2 of the syndrome ‘musculoskeletal’ in Scotland involving 10/17 submissions. Analysis of the individual submissions did not detect any significant trends.
ONGOING NEW AND RE-EMERGING DISEASE INVESTIGATIONS

Jejunal Haemorrhage Syndrome

APHA and partner PME providers are contributing to an ongoing investigation initiated by SAC CVS into potential causes of Jejunal Haemorrhage Syndrome (Oliver and others 2014). Two cases were submitted to add to the dataset; work continues for the foreseeable future.

Bovine Astrovirus

A further case of encephalitis in cattle caused by Bovine Astrovirus (BoAV) has been identified. Investigations are ongoing. More information may be found in the report for the first quarter of 2015 at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/430506/pub-survrep-c0115.pdf

UNUSUAL DIAGNOSES

Congenital defect in Longhorn foetus

Brain, spinal cord and thyroid gland were submitted for histological examination from a stillborn Longhorn calf presenting with mandibular and maxillary brachygnathia, hare lip and cleft palate, hydranencephaly, arthrogryposis and sagittal frontal bone deficit. The foetus was the first incidence of this kind in a herd of 55 Longhorn cattle. Results for Schmallenberg virus PCR were negative and histological examination found no evidence of an inflammatory component. However histopathology did reveal a neural tube closure deficit and consecutive dysplasia within the brain and spinal cord. This range of defects is generally associated with a genetic condition or exposure to environmental teratogens early in gestation.

Hereditary neuraxial oedema in Hereford cattle

Four calves over a period of three weeks died or were culled from a 40 cow Hereford suckler herd within a few days of birth following the development of neurological disease, specifically opisthotonus. This was a closed herd and it was reported that the sire of these calves was closely related to the dams’. Gross post-mortem examination was unremarkable. An interesting diagnosis was subsequently identified on histopathological examination of the brain with a severe, symmetrical, spongiform encephalomyelopathy detected. These changes were indicative of a degenerative condition, most suggestive of hereditary neuraxial oedema which is thought to be an autosomal recessive trait.

The University of Sydney maintains a database of information of known inherited disorders, the Online Mendelian Inheritance in Animals (OMIA), which may be found at the following link:

http://omia.angis.org.au/home/
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.

Fasciolosis

There were fewer samples tested in this quarter: 719 compared to 1131 in the second quarter of 2014. The number of positive diagnoses were, respectively, 73 and 85. The reasons for this could include the use of other diagnostic laboratories, and more targeted sampling by the PVS likely to give a positive diagnosis.

Met Office data indicate a wide variation in rainfall over the UK for last spring. The risk of fluke infection, which is directly related to rainfall, will also vary accordingly. At present the risk would appear to be below average in the south but above average in the north of GB, but with regional variation as described in the weather section.

HORIZON SCANNING

Bovine besnoitiosis

Besnoitiosis, a skin disease of cattle caused by a protozoan parasite, Besnoitia besnoiti, has recently been identified in a closed herd in the Irish Republic. Besnoitiosis has been endemic in parts of mainland Europe (Spain, Portugal) for decades, and was described in Germany and other countries more recently. The acute phase of the disease causes pyrexia, but the main impact is from the less common chronic phase, which leads to significant drop in production, can lead to permanent infertility in breeding bulls, and can have welfare implications. There is an increased risk of import of this condition from the Irish Republic, and some uncertainty over knowledge of how widespread the disease is in mainland Europe. The Cattle Expert Group will consult with industry colleagues to determine whether a targeted surveillance protocol would be appropriate. An information note is available at the following link: http://ahvla.defra.gov.uk/documents/surveillance/diseases/bovine-besnoitiosis.pdf

Haplotype Cholesterol Deficiency of Holstein cattle (HCD)

Newly described mutation in Holstein calves leading to increased mortality. A German cattle breeding company (Masterrind) together with a research group headed by VIT has reported a lethal recessive haplotype affecting Holstein cattle. This mutation is lethal to homozygotes, with heterozygotes being generally asymptomatic. Signs seen in homozygotes are of calves 1-5 months of age showing inappetance, weight loss, diarrhoea with no diagnosed cause and eventual death, associated with cholesterol disturbances (low blood cholesterol). The affected gene is carried by about 3% of black and white and 8% of red and white Holsteins in
Belgian and Dutch herds and 8% in German herds; the homozygote population of calves (ie those affected) is about 0.16%, and appears to be associated predominantly with one North American Holstein bull, ‘Maughlin Storm’. This bull has been widely used throughout Europe including GB; at present the extent of the carrier status is not clear but likely to be of a similar order. **Potential impact:** increased mortality of homozygote affected calves; potential loss of confidence in the dairy breeding sector. **The Cattle Expert Group is collaborating with Holstein UK in investigating the extent of this condition and the potential threat to the dairy breeding sector.**

**REFERENCES**