GB Emerging Threats Quarterly Report

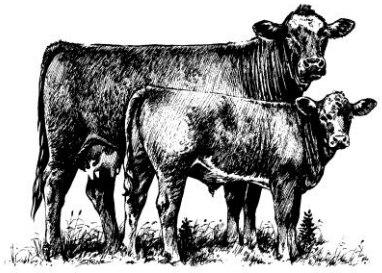
Cattle Diseases

Animal & Plant Health Agency

Safeguarding public and animal health

SRUC

Quarterly Report: Vol 19 : Q3 **July-September 2015**



Contents

Highlights

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, SACCVS and Wales Veterinary Science centre. 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.

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INTRODUCTION

This report contains analysis of animal health and scanning surveillance data and information from APHA, SAC Consulting Veterinary Services (SAC CVS) and non-APHA partner post mortem providers (SAC CVS, University of Bristol, Royal Veterinary College, University of Surrey (four sites), Wales Veterinary Science Centre, Aberystwyth) from the third quarter of 2015 compared to data in previous quarters and years. The network of partner post mortem providers is developing, and the current providers and sites have commenced activity at various times between September 2014 and July 2015. The report is compiled by the APHA Cattle Expert Group, and is based on diagnostic submissions as well as on surveillance data and information from other sources. It is planned for the latter two to be expanded with time as other sources of complementary information are included. These scanning surveillance activities aim to provide timely detection of animal-related new and re-emerging diseases and threats. The information contained in this report, and other linked outputs, is used by government, the livestock industry, farmers and vets to maintain awareness and take action to manage risks that may be associated with the identified threats. Further information can be found at: http://ahvla.defra.gov.uk/vet-gateway/surveillance/index.htm.

SURVEY

APHA's Surveillance Intelligence Unit (SIU) would like to understand more about who is reading the Cattle 'Emerging Threats Quarterly Report' and what information is of the most interest.

Your views will help us to improve the way SIU disseminates information. Please take a few minutes to answer the short survey accessed here: https://www.surveymonkey.co.uk/r/TF8Z2TV .

If you have any questions regarding the questionnaire, please contact Gareth Hateley, Veterinary Lead, by email: Gareth.hateley@apha.gsi.gov.uk

OVERVIEW

Issues and Trends

Climate

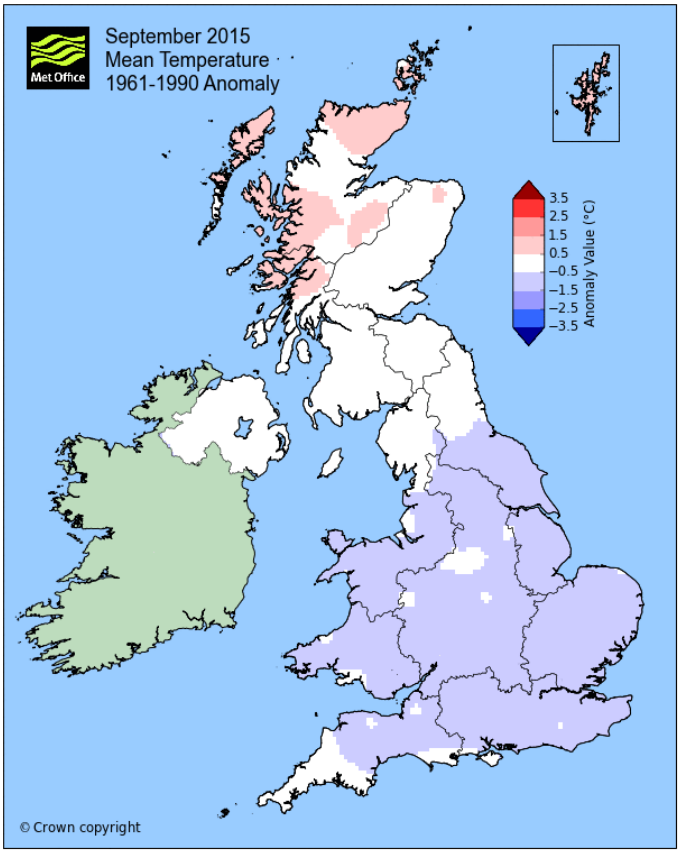


Fig 1: Mean temperature in September 2015 expressed as variation from preceding years 1961-1990

Mean temperature in September 2015 was 1.1℃ below the mean for the years 1961-1991 in England and Wales. In terms of rainfall, there was wide variation across the quarter: in July, significantly higher rainfall was seen in all areas except central England with some local flooding and poorer quality silage, whereas in September most of the north and west of GB was drier, leading to good grazing conditions in these areas towards the end of the quarter, and contributing to a generally good grain harvest which could result in lower feed prices.

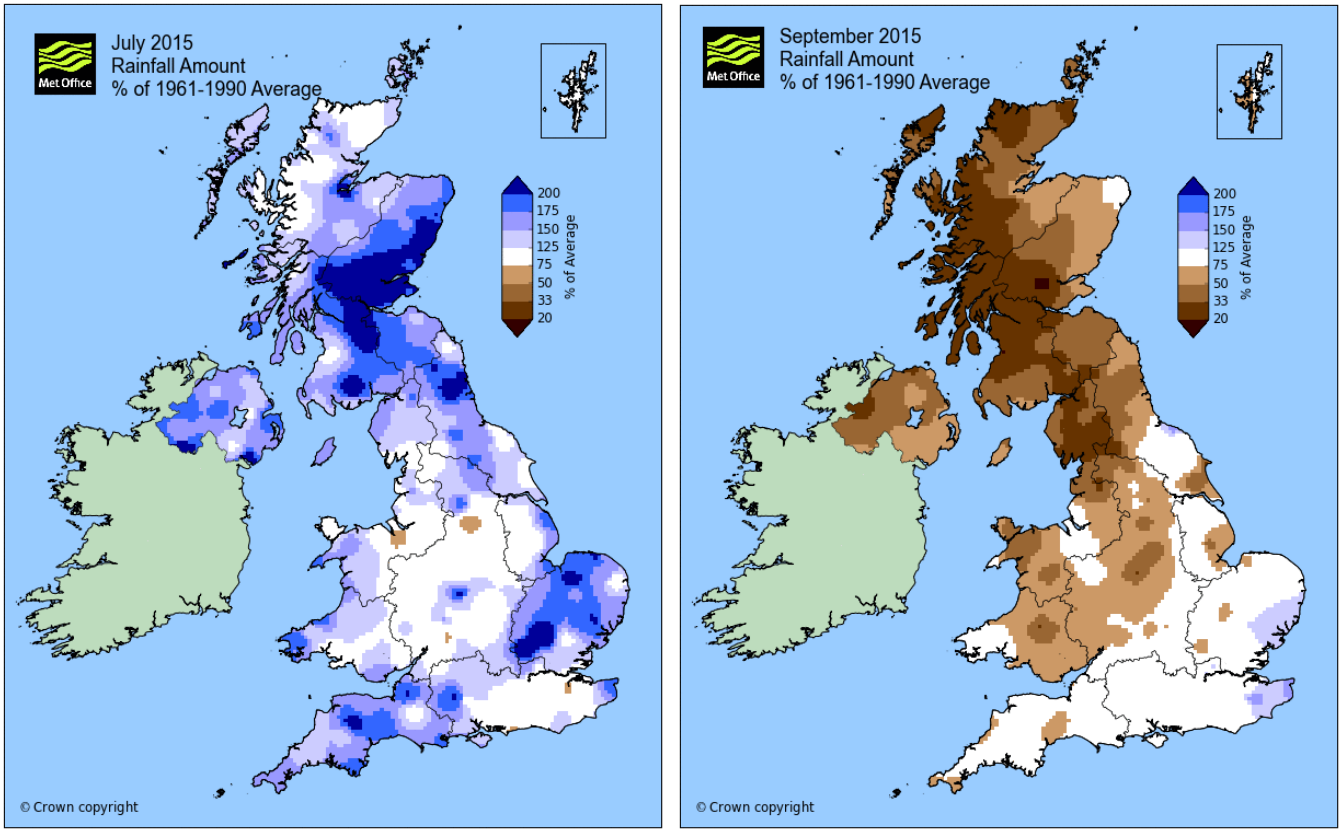


Fig 2: Mean rainfall in July and September 2015 expressed as variation from preceding years 1961-1990

Beef

The unsettled weather referred to above may have had an adverse effect on silage quality in some areas of Scotland, southern England and western Wales. Nutritionists have urged beef farmers to analyse their silage in order to ensure adequate supplementation for winter feeding.

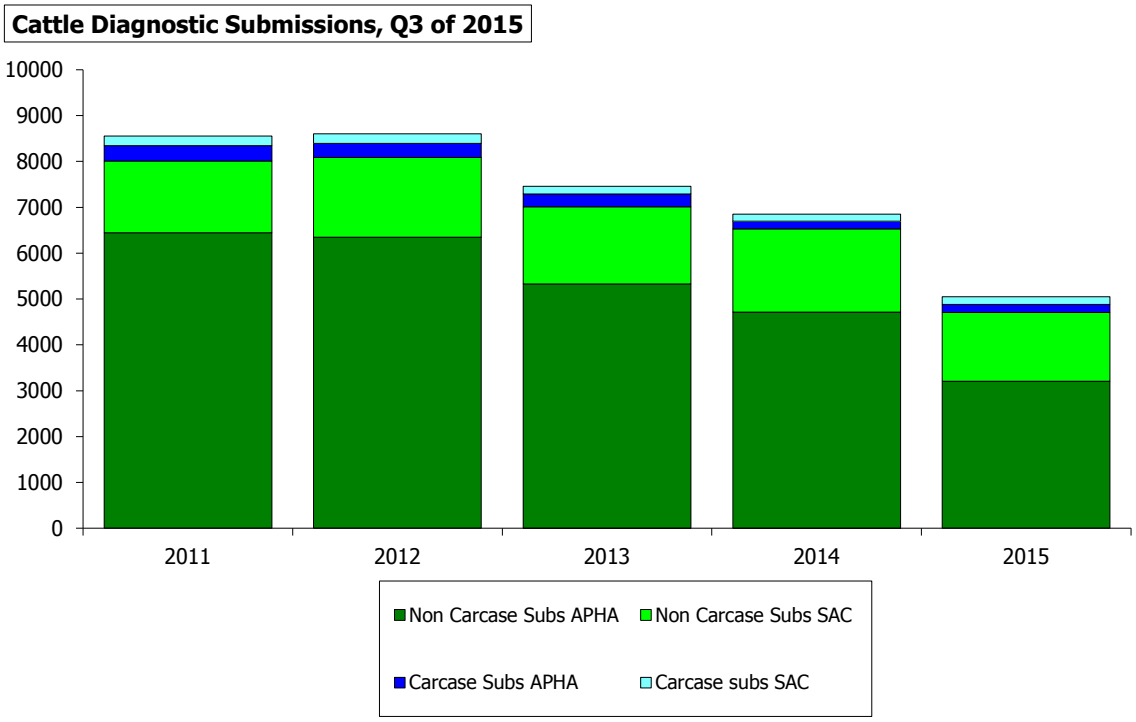
The downturn in the dairy industry has meant that dairy farmers have culled their least productive animals which has meant an increase in supply of cull cows going for slaughter. This increased supply coincided with a reduction in beef prices and difficult trading for beef farmers. Reduced margins may affect the affordability of veterinary input on beef farms, and opportunity for vets to visit, therefore reducing capacity for the veterinary surveillance network. The average deadweight price of steers at the end of this quarter was 347p/kg.

Dairy

The trend of increased UK milk production coupled with reduced prices continued during the third quarter of 2015. The average UK price reported for August 2015 dipped to 23.26ppl, down 0.20ppl from the previous month. This continues to put further economic pressure on dairy producers. A trend reported by many veterinary practitioners is that some dairy producers are reviewing their herd health protocols looking to make savings. In some cases this will be a

reduced use of vaccines or stopping using monthly milk recording, both of which could have a negative impact on herd health. For many units veterinary input into routine herd fertility visits is continuing highlighting the importance of veterinary input into the dairy business and allowing opportunities for disease surveillance activities.

Diagnostic submission trends



	Non Carcase Submissions			Carcase Submissions			
Jul-Sept	APHA	SAC	Total	APHA	SAC	Total	GrTotal
2015	3,206	1,501	4,707	176	167	343	5,050
2014	4,711	1,818	6,529	169	156	325	6,854
2013	5,331	1,680	7,011	276	174	450	7,461
2012	6,349	1,735	8,084	307	209	516	8,600
2011	6,443	1,566	8,009	339	209	548	8,557

Fig 3: Bar chart and table of APHA and SAC C VS diagnostic submissions, Quarter 3, 2015

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 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)*

There was an increase in DNR for the presenting sign ‘clinical mastitis in Q3, from 19-22%. There was no clear pattern relating to area or region, the numbers were small (23 submissions, compared with 66 for the year to date), but the seasonality trend was upward. This trend will be monitored to see if it continues.

Analysis of DNR by syndrome and presenting sign

Analysis of DNR data by syndrome revealed an increase in Q3 (58/344, 16.9%) compared with prior years (526/4552, 11.9%) for the syndrome ‘Systemic and miscellaneous’. This was seen in Wales but mainly Scotland, where the increase was 26/136 submissions in Q3 (19.1%) compared with prior years 128/1142, 11.2%). Examination of the relevant submissions did not detect a trend or focus in parameters such as presenting signs, age or purpose. This syndrome will be monitored into the last quarter of 2015.

* 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

Jejunal haemorrhage syndrome

JHS is a well-recognised but poorly understood condition affecting a segment of the jejunum in adult dairy cattle. SAC C VS is leading an investigation into potential aetiologies, which is being supported by the APHA by providing case material from England and Wales.

Idiopathic necrotic enteritis

INE is a condition affecting suckler calves at grass that likewise has been well described for decades, yet for which an aetiology has not been forthcoming. SAC C VS are leading an investigation, and APHA are also contributing with case material; there is the intention to build up a library of case material that is intended to be used for deep sequencing for potential pathogen involvement.

Haplotype cholesterol deficiency (HCD) of Holsteins

The German organisation VIT recently identified a new haplotype affecting calf mortality among Holsteins. This haplotype has been traced back to the widely used Holstein sire, Maughlin Storm.
The condition, associated with a metabolic cholesterol deficiency, results in calves displaying untreatable chronic diarrhoea and other secondary conditions, before dying at between 3 weeks and 6 months of age. Affected animals have been reported as carrying two copies (homozygous) of a particular DNA Haplotype (now named HCD), and have profoundly low cholesterol levels. Carrier animals (heterozygous) have a single copy and are clinically unaffected but can have measurably lower cholesterol levels

Haplotypes are regions of DNA which tend to be inherited together. A haplotype can contain many genes and is identified using a set of single nucleotide polymorphisms (SNP) markers through genomics. Therefore the presence of the haplotype can usually be identified in each animal via its SNPs. As opposed to causal genes (e.g. Complex Vertebral Malformation (CVM), Bovine Leucocyte Adhesion Deficiency (BLAD)) research on CDH has not yet pinned down which gene or genes in the haplotype is/are responsible for the defect.

The German researchers identified about 8% of the German Holstein population as potentially carrying the haplotype, and about 0.2% likely to be homozygous. Preliminary work by Holstein UK suggested that levels in the UK are 4-6%. The Cattle Expert Group has liaised closely with Holstein UK with advice to avoid close breeding with the known carriers, and awareness raised about the condition amongst VIOs and partner PME providers, although the number of farms are likely to be very small in which both the male and female genetics could give rise to detectable numbers of homozygous offspring.

For more information see http://ukcows.com/theCDI/Article.aspx?nid=340

UNUSUAL DIAGNOSES

Babesiosis

Babesiosis or 'redwater' was diagnosed in a group of cattle which comprised six purchased heifers and calves in addition to 27 yearlings. Two of the three year old heifers were found dead after a 24 hour period of malaise. The animals were on rented land which had not previously been used by the farmer. Postmortem examination of one of the animals which died revealed generalised jaundice and haemoglobinuria. Ticks were present in the axilla. Examination of blood smears stained using Giemsa was inconclusive, but a PCR for *Babesia* species was positive and subsequent sequencing confirmed *Babesia divergens,* the cause of babesiosis in the UK. The case highlighted the interesting epidemiology of this disease: the previous resident cattle population of 30 years had reached endemic stability and were likely immune, while the incoming young cattle (yearlings and calves) were not affected because of the age-related immunity, whereas the incoming older naïve cattle developed clinical disease.

Chlamydial abortion

Chlamydia abortus infection was confirmed as the cause of an abortion in a 'flying herd' of 400 dairy cows in north Wales. Pregnancy losses were regularly reported, occurring at around five per month; however, no foetuses had previously been obtained for examination. The calf had its placenta attached which showed marked diffuse necrosis especially of the non-pregnant horn area, with irregular yellow to brown thickening of the remainder and haemorrhagic and necrotic cotyledons (see Fig 4).

Figure 4: Irregularly thickened and necrotic placenta cause by *Chlamydia abortus* infection

PCR testing ruled out *Coxiella burnetii* (the cause of 'Q-fever') and confirmed *C. abortus* infection. Histopathology identified characteristic necrotising placentitis with the organism labelled using immunohistochemistry. *C. abortus* is of course much more commonly recognised as a cause of abortion in sheep, but bovine abortions are also identified and occasionally in the

past have been associated with herd outbreaks. In the last 10 years, however, only 8 confirmed cases have been diagnosed in the APHA.

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

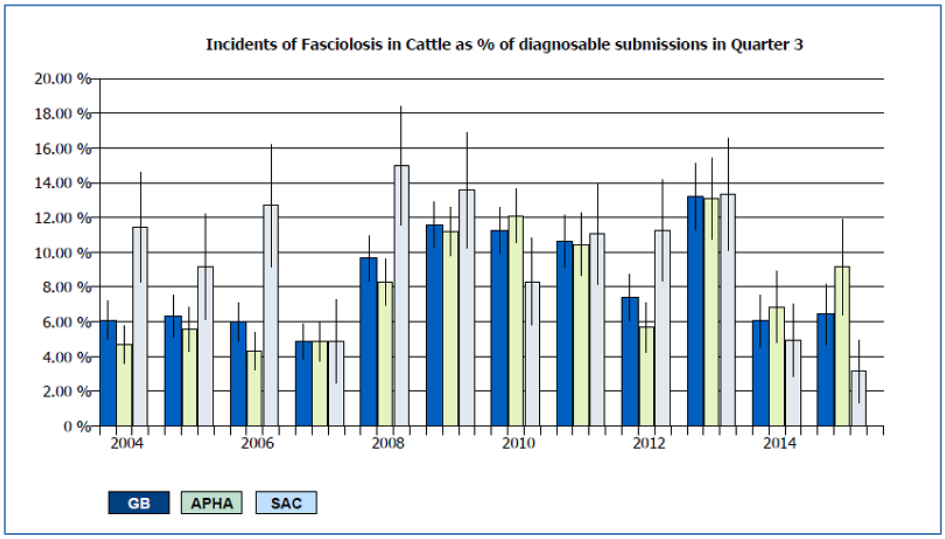


Fig 5: Incidents of fasciolosis in cattle as percentage of diagnosable submissions, Q3

The weather during the last quarter was mostly unsettled and cool, with higher than average rain for most regions. The initial NADIS forecast for this autumn is for a high risk of liver fluke for western regions and very high for all of Scotland. This is now being revised in view of the recent very dry weather, to a more moderate forecast. VIDA data so far, albeit from a smaller number of samples submitted (778 samples this quarter compared to 991 for third quarter 2014), are in agreement with a more moderate forecast.

There was a significant reduction in percentage diagnosis in this quarter, for Scotland, compared to the same quarter in 2014. A non-significant rise was seen in England and Wales compared to the same quarter in 2014.

Two cases of acute fasciolosis in sheep have been reported to VICs in England and Wales in October.

HORIZON SCANNING

Bluetongue type 8 has been detected in central France. The first cases were found in late August. Since then report cases and a serosurveillance study across 87 Départements across France has identified BTV-8 on 95 holdings, all in central France, an area with high cattle density, with no evidence as yet of spread beyond this area. Clinical signs appear to be mild. Initial work by French authorities suggests a high degree of homology with the 2006 strain. The route of entry is again unknown. Vaccination in the infected area is being undertaken. The risk to the UK is of imported animals and midge movement, and is considered very low to negligible. Post import testing of animals known to have been imported from the current infected area since the beginning of August 2015 is thus far negative; current meteorological modelling suggests a very low risk of spread this year of midges. A risk assessment for the use of vaccination is being prepared; the risk next year will be regularly reassessed. Colleagues are asked to be aware of signs both acute and congenital disease. For further information on BTV-8 please see Williamson and others (2008).

JH1 genetic defect in Jersey cattle: A novel autosomal recessive gene has been identified in China in Jersey cattle imported from the USA. They describe the condition which leads to early embryonic loss as a point mutation, and primers that can identify the gene, finding 8/21 positive in the affected population (Zhang and others 2015). They consider this to be potentially a worldwide problem given the relatively small population of Jerseys. The CEG will continue to maintain awareness.

Bovine besnoitosis was reported for the first time in the Irish Republic in July. More details of the disease are available (EFSA 2010). Diagnosis in GB is only by histopathology but other tests are available in mainland Europe. Given the chronic nature of the disease and significant proportion of cattle carrying the parasite with minimal/no clinical signs, it is likely to be more widespread than currently recognised; spread between herds is most likely by movement of such animals. The Cattle Expert Group is reviewing diagnostic options and a targeted surveillance programme is being considered.

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Zhang, J and others (2015). *J Vet Diagn Invest* **27**, 596-9