GB Emerging Threats Quarterly Report

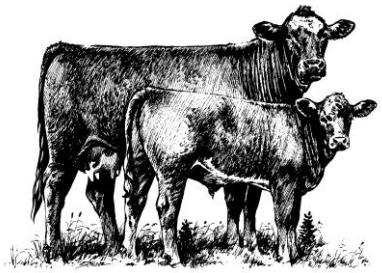
Cattle Diseases

Animal & Plant Health Agency

Safeguarding public and animal health

SRUC

Quarterly Report: Vol 19 : Q4 and annual **October-December 2015**



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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 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.

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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 fourth 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.

OVERVIEW

Issues and Trends

Meteorology

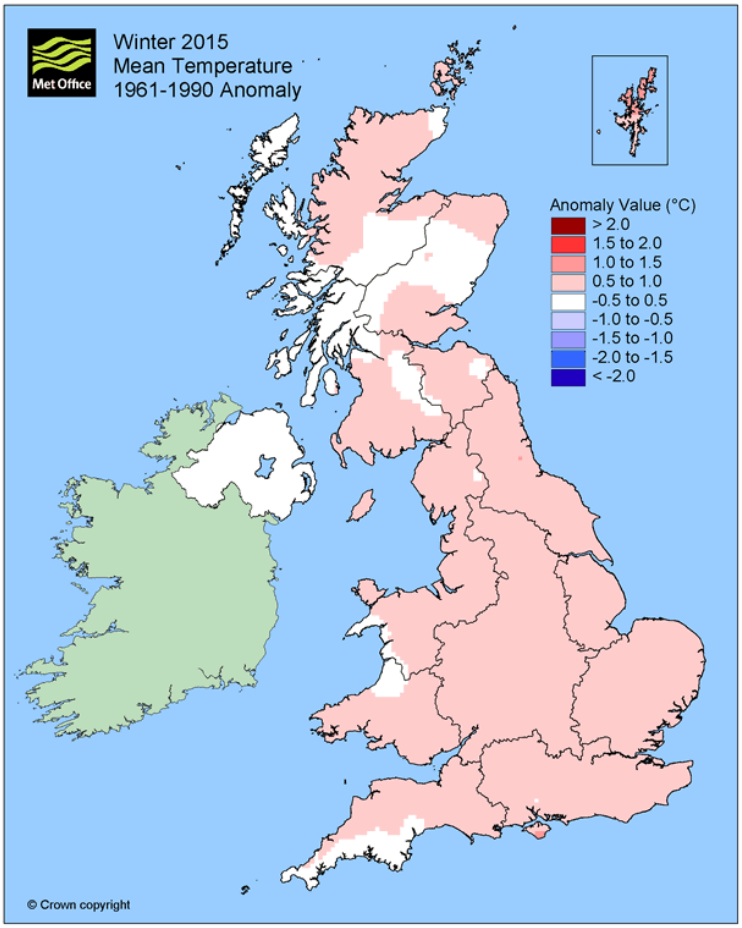

Fig 1: Mean winter temperature as % of 1961-1990 mean

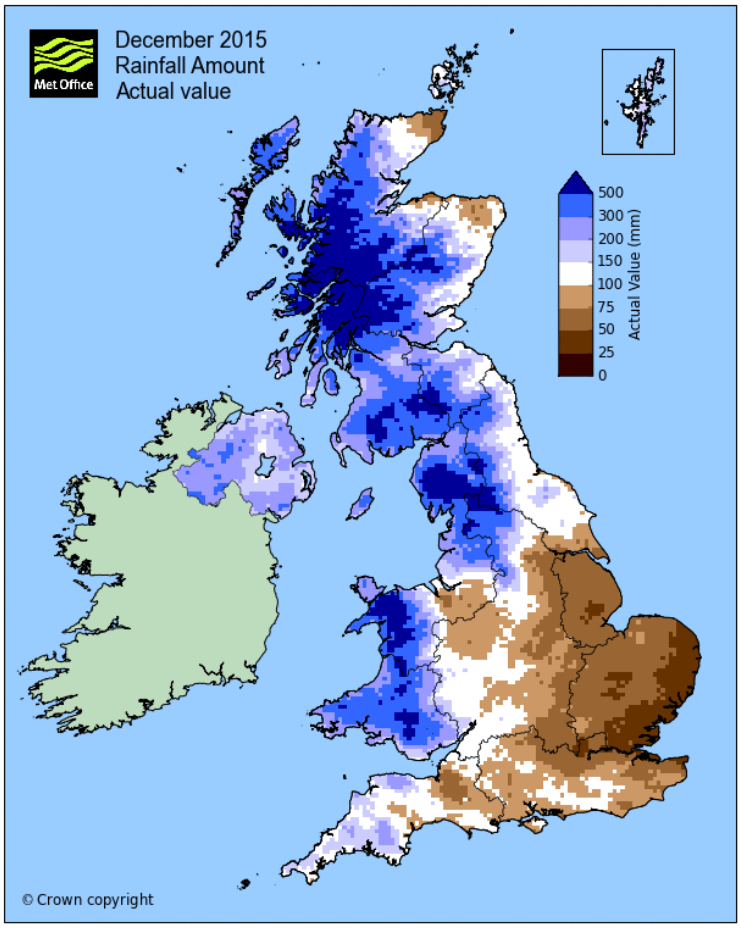

Fig 2: Actual December rainfall

- Severe flooding events in Cumbria and widespread areas of Scotland triggered by high two day rainfall on saturated ground (Fig 2) has caused local to regional difficulties for farmers such as access to stock, availability of forage and infrastructure damage (bridges, fences etc) which are causing short to medium term severe problems
- A warmer winter with mean temperatures across the period around a degree warmer than the 30-year period (Fig 1) could have implications for overwintering of vectors of vector-borne disease should this trend continue.

Beef quarter 4 (Q4) and annual summary

According to the Defra Farming Statistics released in October, there was an increase in the beef breeding herd of 0.5%, from 1.569 million to 1.577 million for the UK as a whole. The current figure still represents a fall of 200,000 head in the UK beef herd over the last decade. The future for the beef industry still looks uncertain, with possible reductions in the CAP payments and possibly reduced access to environmental stewardship payments for beef farmers. This uncertainty will affect farmers' ability to invest in health schemes and eradication plans for diseases such as BVD and Johne's disease.

As reported in the last quarterly report, further pressure on beef farmers has come from an increased supply of dairy cows being culled and slaughtered from dairy herds, because of the continued low price of milk, and in order to avoid the cost of winter feeding and housing. Farmers in the North West of England have seen some government support following the extensive flooding experienced in December.

British Cattle Movement Service data indicated an increase in beef-sired calf registrations in 2015. This was 36,000 more for the first seven months of 2015 compared to the same period in 2014. If this trend continues, it will mean a modest increase in supply of beef animals coming to the market in 2016.

The average deadweight price of steers at the end of the year was 335.5 p/kg, which was down on the previous quarter by about 10p/kg.

Dairy

The last quarter of 2015 showed milk prices still falling across most contracts. Of concern is that milk production has continued to rise above 2014-15 levels with no quota limitations, no disincentive to expansion and with some producers trying to maximise returns on fixed costs. An EU report 'Prospects for EU agricultural markets and income 2015 – 2025' does predict a slow recovery for the dairy sector to 2020 so farmers are having to adapt to an era of low returns in the medium term.

Increased numbers of cull dairy cows were traded in the last quarter of 2015 with producers removing un-productive cows to improve efficiency. Given that cow health and productivity is optimised when accommodation is understocked by between 5 and 10% this removal of cull cows may have been realised without a significant reduction in milk production.

Veterinary involvement in the dairy sector is continuing to come under pressure depending on individual farmer contracts and financial performance. This may impact on the individual treatment and investigation of clinical cases and therefore surveillance; however, routine involvement in preventative health measures is accepted as a cost effective by many producers.

Diagnostic submission trends

	Carcase			Foetus/Stillborn			Other				Total	
Q4	Q4 Subs	2015 v Prior2	2015 v Prior 5	Q4 Subs	2015 v Prior2	2015 v Prior 5	Q4 Subs	2015 v Prior2	2015 v Prior 5	Subs	2015 v Prior2	2015 v Prior 5
England	157.	83. %	61. %	92.	78. %	61. %	2,688.	63. %	53. %	2,937.	64. %	53. %
Wales	27.	96. %	62. %	27.	113. %	84. %	620.	72. %	63. %	674.	74. %	64. %
Scotland	124.	85. %	74. %	66.	102. %	85. %	978.	73. %	69. %	1,168.	75. %	70. %
Unknown	3.	75. %	107. %				87.	76. %	89. %	90.	75. %	89. %
	311.	**85. %**	**66. %**	185.	**89. %**	**71. %**	4,373.	**66. %**	**57. %**	4,869.	**68. %**	**58. %**

Fig 3 Table of breakdown of submissions for Q4 and comparison with preceding 2 and 5 year Q4 mean

	Carcase			Foetus/Stillborn			Other			Total		
Annual	2015 Subs	2015 v Prior2	2015 v Prior 5	2015 Subs	2015 v Prior2	2015 v Prior 5	2015 Subs	2015 v Prior2	2015 v Prior 5	Subs	2015 v Prior2	2015 v Prior 5
England	636.	69. %	47. %	466.	81. %	63. %	12,357.	67. %	58. %	13,459.	67. %	58. %
Wales	139.	89. %	61. %	95.	93. %	68. %	3,145.	81. %	74. %	3,379.	81. %	73. %
Scotland	771.	91. %	77. %	382.	78. %	69. %	4,668.	78. %	72. %	5,821.	80. %	72. %
Unknown	19.	224. %	179. %	4.	89. %	77. %	384.	104. %	100. %	407.	106. %	102. %
	1,565.	**81. %**	**60. %**	**947.**	**81. %**	**66. %**	**20,554.**	**71. %**	**64. %**	**23,066.**	**72. %**	**63. %**

Fig 4 Table of breakdown of submissions for 2015 and comparison with preceding 2 and 5 year mean

The tables above (Figs 3 and 4) illustrate the breakdown of submission types compared with the preceding 2 and 5 year means, as actual figures and percentage of them, for each of the GB countries. Q4 broadly mirrors the annual figures.

These illustrate a fall in all submission numbers for all types of submission in all countries. There are a number of potential explanations for this. Firstly, as has already been remarked, all sectors of the cattle industry have been under significant financial pressure over recent months and years. This could put downward pressure on submission numbers. There have been significant changes within the industry and the structure of the veterinary profession serving it, which could also have had an impact, in that greater use of private laboratories from which data are not currently gathered could reduce submission numbers. This fall in submission numbers is most marked in England.

In addition, the decline in carcase submissions in England are the most marked. Reasons for this are not clear, since the changes in the provision of post-mortem services occurred in both England and Wales, although they were more profound in England.

	2011	%	2012	%	2013	%	2014	%	2015	%	Sum:
Enteric	14,765	31 %	14,846	30 %	13,819	32 %	11,149	31 %	8,940	30 %	63,519
Unknown (999,990,991,980,970)	10,532	22 %	12,477	25 %	9,255	22 %	7,937	22 %	7,353	25 %	47,554
Reproductive	9,845	21 %	10,530	21 %	8,634	20 %	8,079	22 %	6,169	21 %	43,257
Systemic & Misc	6,227	13 %	6,408	13 %	5,968	14 %	4,751	13 %	3,529	12 %	26,883
Respiratory	3,057	6 %	2,818	6 %	2,617	6 %	2,469	7 %	1,947	7 %	12,908
Mastitis	2,031	4 %	1,649	3 %	1,255	3 %	1,064	3 %	745	3 %	6,744
Musculo-skeletal	346	1 %	407	1 %	348	1 %	309	1 %	243	1 %	1,653
Nervous / Sensory	367	1 %	385	1 %	340	1 %	311	1 %	247	1 %	1,650
Circulatory	368	1 %	377	1 %	272	1 %	192	1 %	155	1 %	1,364
Skin	253	1 %	267	1 %	196	0 %	197	1 %	147	0 %	1,060
Urinary	70	0 %	75	0 %	42	0 %	53	0 %	52	0 %	292
	47,861	100 %	50,239	100 %	42,746	100 %	36,511	100 %	29,527	100 %	206,884

Fig 5 : Table of breakdown by syndrome

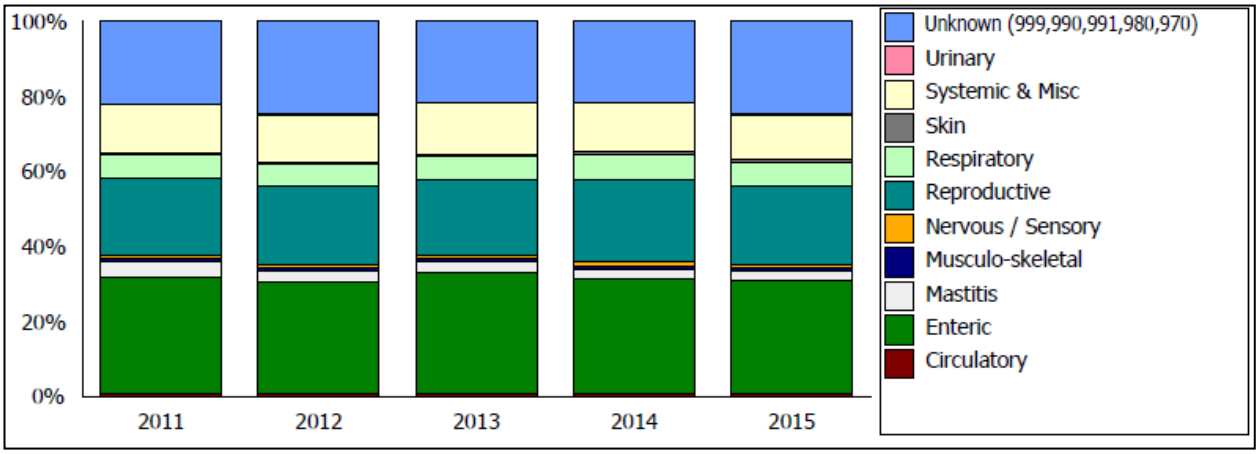

Fig 6 Segmented bar chart of syndromes as above

The bar chart (Fig 6 above), derived from figure 5, gives a visual illustration of the breakdown of all submission types according to the relevant syndrome over recent years, and suggests that there are as yet no marked changes in the proportions, although Fig 5 illustrates there is a continuing fall in submission numbers. The CEG will monitor this over future reporting periods.

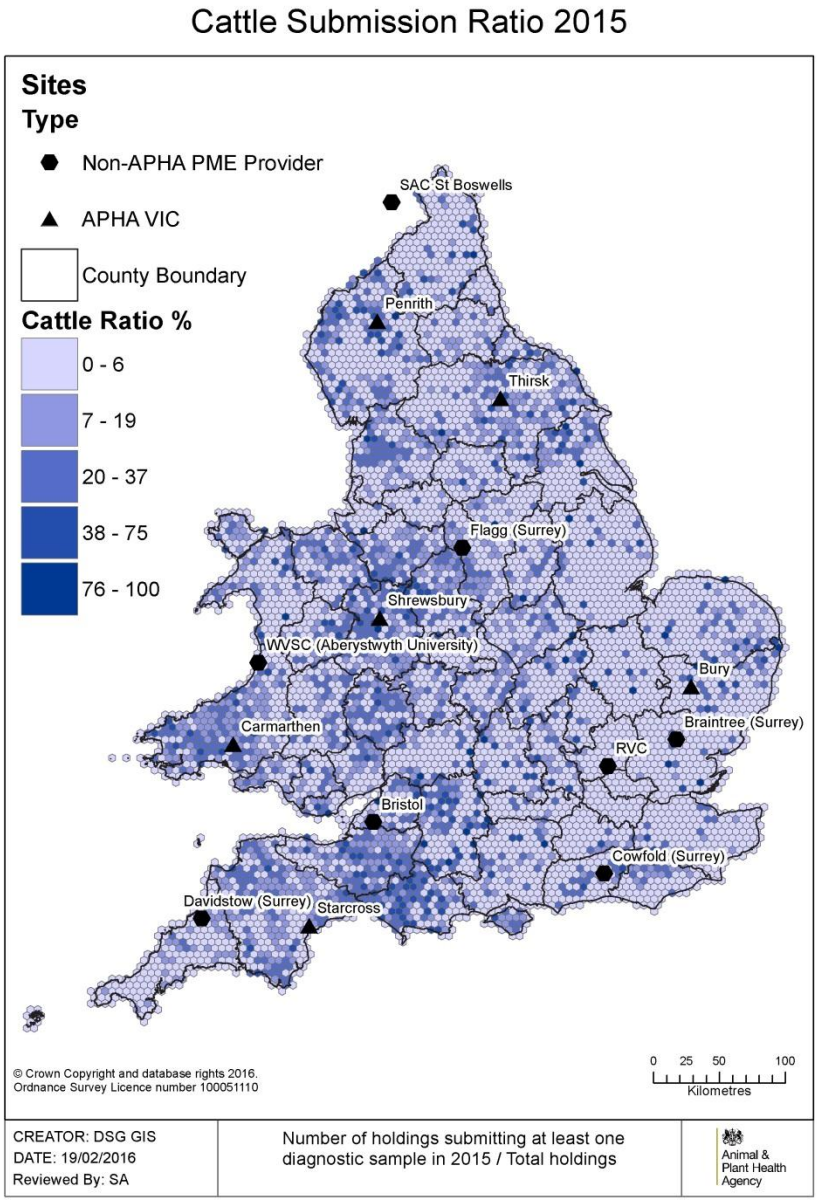

Fig 7 Percentage of holdings submitting at least one cattle diagnostic sample in 2015, expressed as equal-sized hexagons

The map above (Fig 7) gives an illustration of the percentage of holdings submitting at least one cattle diagnostic submission (the 'submission ratio'), by dividing the country into equal-sized hexagons which give an illustration of the variation in submission spatially, without identifying individual holdings. The county boundaries and location of APHA and partner PME provider sites are also illustrated. The distribution broadly reflects the population density of cattle (see Fig 8 below), with some exceptions such as parts of the southwest and the north of England. There may be PME providers in those areas not contributing to our surveillance, variation in engagement with the new post-mortem services, or possibly a higher proportion in some areas of herds that are less likely to submit material, as identified in the ED1039 Gap Analysis project- namely actively disengaged farmers, farmer dealers, farmers who are either early or late adopters of new practices (Watson and others 2014).

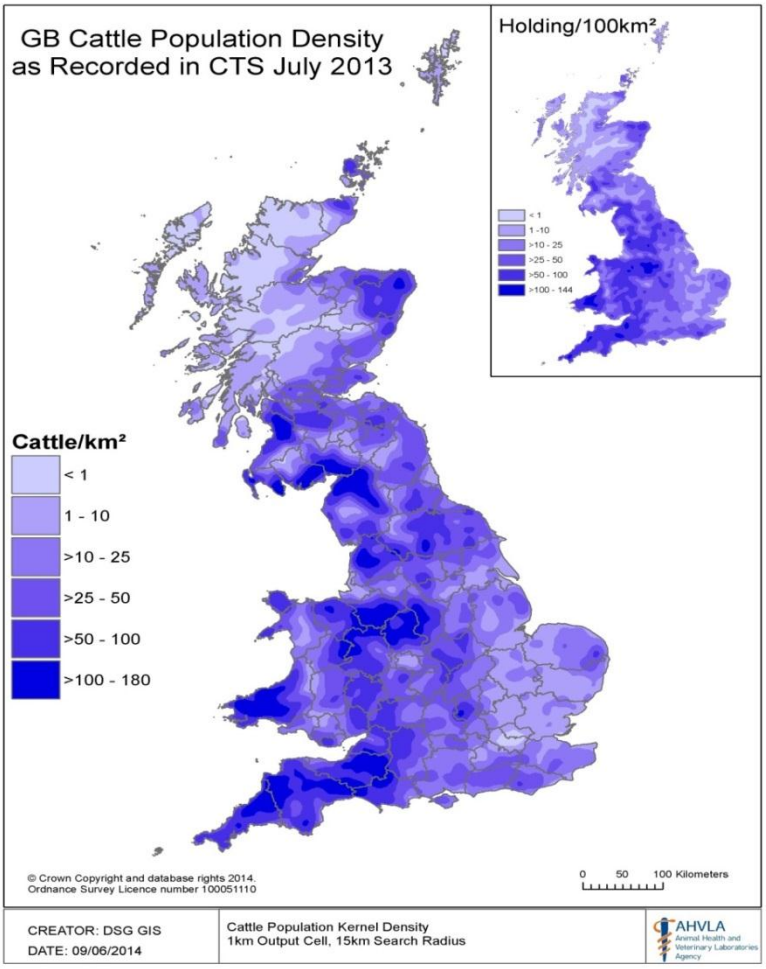

Fig 8 GB Cattle population density, 2013

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)*

There was no evidence from DNR analysis in Q4 and the complete year, 2015, 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.

DETECTION OF ACTUAL AND POTENTIAL NEW AND (RE)EMERGING DISEASE THREATS IN 2015

The threat summary for cattle 2015 provides information on the threats to cattle identified by the Cattle Expert Group (CEG) over the 12 months of 2015. Thirteen threats were identified in 2015, 9 were threats which are present in GB cattle. Information from surveillance partners or non-submission data sources detected 5 of the 13 threats while 6 were detected by post-mortem submissions to APHA, SAC CVS or a third party PM provider and a further 3 were detected from analysis of Scanning Surveillance submission data or non-PM submissions. Eleven were raised with the Veterinary Risk Group as either threats or points for information. The work of the Surveillance Laboratory Services Department is integral to threat detection through its veterinary investigative, diagnostic and laboratory testing roles. Links with other areas of expertise within APHA have been essential in investigating and characterising threats identified. The groups who liaised on specific threats are detailed in the spreadsheet and include Virology, Bacteriology, Sequencing, Pathology, Antimicrobial Resistance, Toxicology/food safety, non-statutory zoonoses, International Diseases Monitoring and Exotic Diseases Teams. A variety of means of disseminating data have been used with presentations at meetings being prominent, also disease alerts and information sheets, these having the advantage of rapid production and direct dissemination to target audiences.

ONGOING NEW AND RE-EMERGING DISEASE INVESTIGATIONS

Haplotype Cholesterol Deficiency (HCD) in Holstein cattle - This novel genetic disease, reported in 2015, is becoming better understood. Holstein UK is producing a list of known carriers and awareness has been raised, so in due course clinical HCD should reduce as crosses leading to the homozygote state are avoided. However, a recent case clinically suspected by APHA Penrith has been confirmed by genetic testing. As further cases may be seen in Great Britain, particularly if an as yet unidentified carrier is involved, colleagues are reminded to be aware of the signalment (3-week to 5-month-old Holstein calves with signs of marked condition loss and unresponsive diarrhoea with no diagnosable cause leading to death). Cholesterol testing alone should not be relied upon to confirm a diagnosis of HCD, but may be suggestive. In the most recent case investigated by APHA, cholesterol levels although reduced and below the reference range, were not negligible as reported in Germany (Kipp and others 2015).

Psoroptic mange

Psoroptic mange was diagnosed in a group of 10 homebred and purchased bulling heifers in Herefordshire in November. Two animals were more severely affected but all had scabs present. Large numbers of live mites were detected after treatment with macrocyclic lactone pour-on and an ivermectin injection. There was no link to the disease in sheep. Washing to remove scabs, treatment and monitoring effectiveness with scrapes were advised. Psoroptic mange in cattle is slowly spreading; the CEG is monitoring this in association with the APHA Parasitology Champion.

UNUSUAL DIAGNOSES

Severe pneumonia in grazing cattle

The University of Bristol reported severe respiratory disease (dyspnoea and polypnoea) seen in a five-year-old suckler cow at grass, one of a group of 50 cows and calves. The group had been moved a week previously to more lush pasture and the referring vet suspected fog fever. However, at post mortem examination there was marked pleuropneumonia with extensive pleural fluid, in which the consolidated lung had a marbled appearance because of extensive interstitial oedema and dark areas of necrosis.

These findings are very suggestive of *Mannheimia* spp. pneumonia, particularly the severe pleurisy, and pure growths of *Mannheimia varigena* (an organism very similar to *Mannheimia haemolytica)* were isolated from the lungs. Bacterial pneumonia is uncommon in cattle at grass, particularly adult suckler cows, and it was thought likely there was some (unidentified) predisposing factor/stressor. Whenever pathology like this is encountered (large volume of pleural fluid, severe pleuropneumonia), the possibility of Contagious Bovine Pleuropneumonia (CBPP, a notifiable disease caused by *Mycoplasma mycoides* subsp. *mycoides*) should be considered, as was in this case. This exotic infection is usually unilateral and consolidation restricted to the caudal lung lobes, but the affected lung does have a marbled appearance.

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 Quarter 4 2015

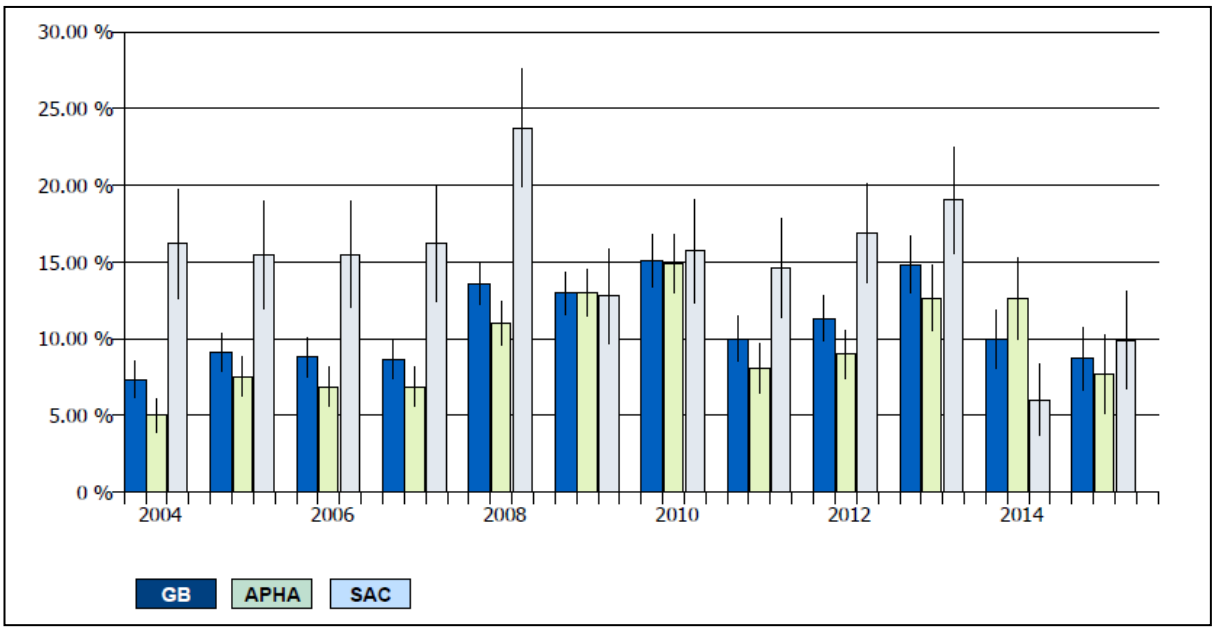

Fig 9 Incidents of fasciolosis in cattle as a percentage of diagnosable conditions, Q4 2015

The percentage diagnosis for this quarter for England and Wales, compared to that for Scotland, seem to be moving in different directions, with respect to the equivalent figures for 2014 (Fig 9). There was a significant fall for England and Wales, but an increase for Scotland, albeit not significant. This was not seen in the annual data for 2015.

This trend also occurs for acute and chronic fasciolosis in sheep for Scotland, where there is a much higher percentage diagnosis than for England and Wales. The weather conditions in 2015 favoured the life cycle, particularly in Scotland where there was a wet spring followed by a very wet November and December (see Meteorology section above).

HORIZON SCANNING

Bluetongue (BTV) – Outbreaks of Bluetongue were reported in France, Italy and eastern Europe during 2015 (Fig 10). France has continued to report BTV-8 in central regions with spread in a southerly direction. The restriction zones have also been increased to include the Dordogne and Haute Vienne regions, although three regions are reporting a low vector activity period (Savoie, Haute Savoie and Haute Alpes) where cold temperatures and snowfall mean fewer midges are present. Vaccination is taking place but uptake in the different regions is not known. Austria reported two further outbreaks of BTV-4 (and Italy reported outbreaks of both BTV-4 and BTV-1. A qualitative risk assessment for entry of BTV-8 into the UK in 2016 has been published: https://www.gov.uk/government/publications/qualitative-risk-assessment-bluetongue-virus-btv-8-entry-into-the-uk.The most likely pathway for disease introduction is through the movement of infected / infectious midge vectors and while the daily average

temperature is low and disease is not reported near the French coast, this risk level is remains very low**.**

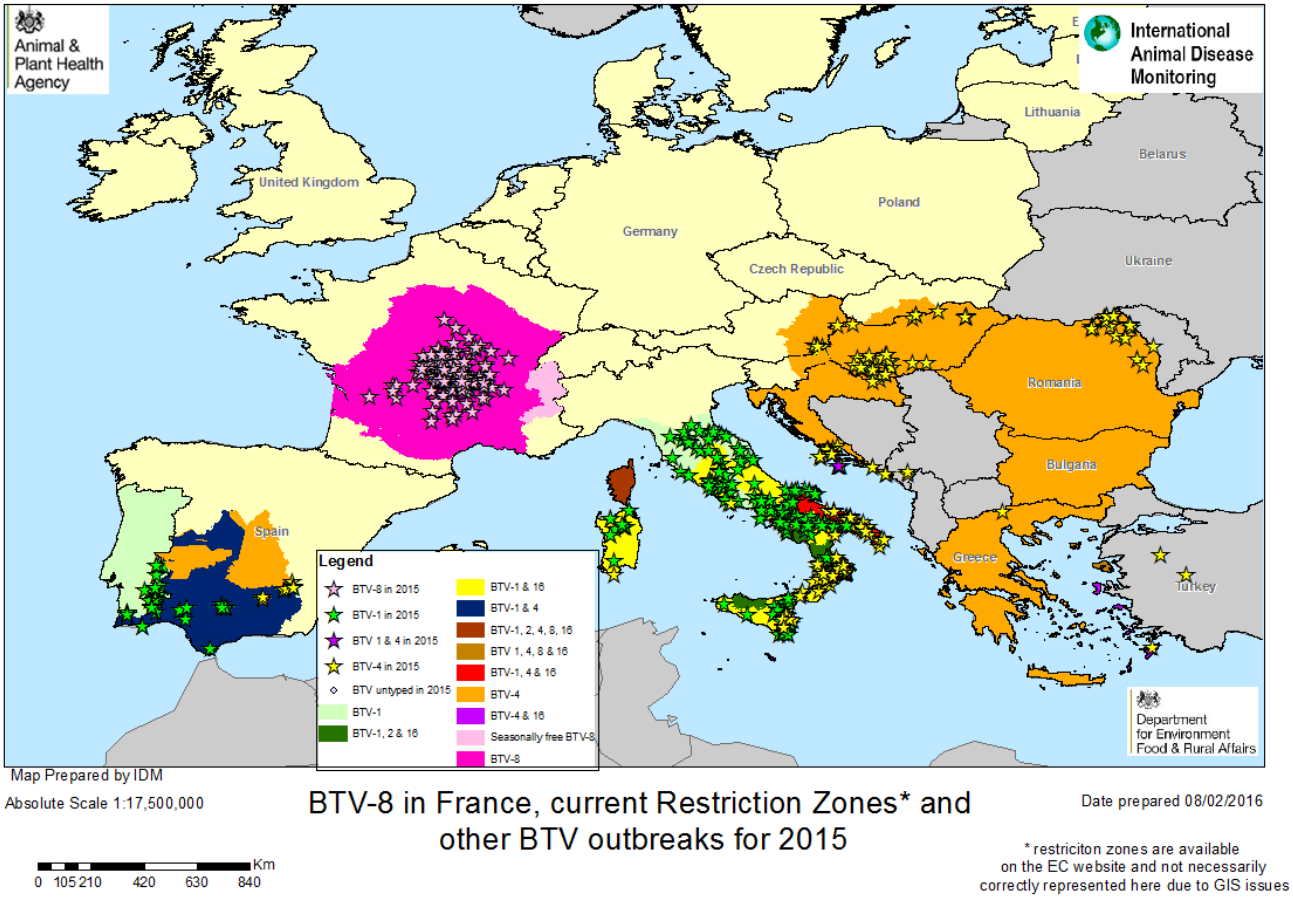

Fig 10 BTV Outbreaks in Europe, 2015

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