

GB Emerging Threats Quarterly Report Miscellaneous & Exotic Farmed Species Diseases



Safeguarding
public and
animal health



Quarterly Report: Volume 18 : Q2

April to June 2016



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Highlights

- Tick Borne Fever in Water Buffalo
- Endocarditis and concurrent fasciolosis in alpaca
- Yersiniosis in deer
- Cervid spongiform encephalopathy/ Chronic Wasting Disease update

VIDA diagnoses are recorded on the APHA FarmFile database and SAC Consulting 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 CVS 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 CVS 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 CVS. 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 and Wales Veterinary Science Centre) from samples submitted in the second quarter of 2016 compared to the equivalent quarter of previous years. It aims to identify emerging miscellaneous and exotic farmed species 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 Policy Implementation Directorates. Further information can be found at <http://ahvla.defra.gov.uk/vet-gateway/surveillance/index.htm>.

OVERVIEW

Diagnostic submission trends

Diagnostic submissions in Quarter 2 (April to June) 2012-2016 for alpacas, llamas and farmed deer – the APHA figures include submissions to partner post mortem providers (PPP) as detailed above. Other miscellaneous and exotic species may also be received in small numbers.

April - June	Carcase Submissions			Non-Carcase Submissions			GB Total
	APHA	SAC	Total	APHA	SAC	Total	
2012	48	8	56	96	12	108	164
2013	38	11	49	73	11	84	133
2014	23	5	28	72	9	81	109
2015	13	6	19	81	9	90	109
2016	14	3	17	64	9	73	90

Diagnostic submissions for Quarter 2 summed together for all years (2012 -2016) for each main species covered by this report and also for each main geographical area.

All Years	ALPACA	DEER	LLAMA	Sum:
Eastern England	148	36	11	195
Northern England	54	23	4	81
Scotland	34	37	4	75
Wales	28	7	3	38
Western England	130	28	13	171
Unknown	35	6	4	45
Sum:	429	137	39	605

Carcase and non-carcase submission numbers to APHA (including partner post mortem providers) and SAC CVS are at the lowest level over the five years detailed above although carcase numbers are not very different to this quarter last year. As with this quarter last year, the highest number of submissions came from the east and west of England. Overall submissions to most regions decreased this quarter compared to last year although the north and the west showed an increase. The north showed an increase in deer and llama submissions and a decrease in alpaca submission and the west showed an increase in both deer and alpaca submissions.

Of the 19 carcase submissions (see table below) received by APHA and SAC CVS in the second quarter of 2016, 5 have been handled by our partner post mortem providers (PPP).

Alpaca make up the majority of the submissions from all geographic areas with the exception of Scotland where deer closely followed by alpaca predominate.

Table to show the number and percentage of various types of submissions (carcase, foetus/stillborn, other) in Q2 2016 as compared to Q2 previous 2 years and previous 5 years.

Q2		Carcase			Foetus/Stillborn			Other			Total		
		2016 Subs	2016 v Prior2	2016 v Prior 5	2016 Subs	2016 v Prior2	2016 v Prior 5	2016 Subs	2016 v Prior2	2016 v Prior 5	Subs	2016 v Prior2	2016 v Prior 5
England	Northern England	2	67%	31%				13	130%	116%	15	115%	83%
	The Midlands	1	67%	14%	2	400%	500%	11	122%	98%	14	127%	74%
	Eastern England	1	33%	28%				4	47%	41%	5	42%	37%
	Southern England	11	110%	79%				21	76%	59%	32	84%	62%
Wales	Wales	1	67%	38%				3	32%	52%	4	36%	47%
Scotland	Scotland	3	55%	43%				5	63%	54%	8	57%	47%
Unknown/	Unknown/NonGB							15	143%	208%	15	130%	183%
		19	75%	45%	2	100%	56%	72	87%	80%	93	84%	69%

Diagnostic submissions for Quarter 2 2012 to 2016 for miscellaneous species by syndrome

	2012		2013		2014		2015		2016		Sum:
Circulatory			2	1%	1	1%	1	1%	2	2%	6
Enteric	56	32%	47	33%	30	26%	41	38%	26	26%	200
Mastitis	1	1%									1
Musculo-skeletal	4	2%	3	2%	4	3%	1	1%	3	3%	15
Nervous / Sensory	4	2%	4	3%	3	3%	2	2%	2	2%	15
Reproductive	12	7%	5	3%	6	5%	3	3%	4	4%	30
Respiratory	2	1%	5	3%	4	3%	3	3%	1	1%	15
Skin	8	5%	5	3%	7	6%	7	6%	7	7%	34
Systemic & Misc	66	38%	47	33%	43	37%	31	28%	36	36%	223
Urinary	1	1%	2	1%							3
Unknown (999,990,	21	12%	23	16%	17	15%	20	18%	20	20%	101
Sum:	175	100%	143	100%	115	100%	109	100%	101	100%	643

As can be seen from the above table the largest numbers of submissions are diagnosed with a systemic or miscellaneous condition followed by enteric disease. These two syndromes are the most common for all years in the table with enteric disease dominating in 2015.

VETERINARY INVESTIGATION DIAGNOSIS ANALYSIS (VIDA)

The annual report on data recorded by APHA and Scotland's Rural College on animal and bird diagnostic submissions in Great Britain is available to view at <https://www.gov.uk/government/publications/veterinary-investigation-diagnosis-analysis-vida-report-2015>. This document looks at total diagnostic submissions and then breaks these down into monthly and yearly trends for each species.

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 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.

There was no evidence from DNR analysis in Q2, 2016, of new and emerging disease in the species covered by this project.

ONGOING NEW AND RE-EMERGING DISEASE INVESTIGATIONS

There are no on-going investigations of potential new or (re)emerging diseases.

UNUSUAL AND INTERESTING DIAGNOSES

Tick Borne Fever in Water Buffalo

Heparin blood samples from two female adult water buffalo (*Bubalus bubalis*) from a milking herd tested positive by polymerase chain reaction (PCR) for *Anaplasma phagocytophilum**. The private veterinary surgeon was suspicious of this condition given the history and the identification of cytoplasmic inclusions in the neutrophils on a blood smear made at the practice. The problem had been occurring for over 5

years with 3-4 animals being affected last year with clinical signs of milk drop, malaise and hindlimb weakness. Young stock are reared at two different sites and it is suspected that animals at the distant site are becoming immune whilst those at the home site are not. Sheep also graze the same pastures. The practitioner suspects that a parasitaemic animal has been returned to the home site which had infected the ticks resulting in disease in the naïve younger animals.

Tick Borne Fever (TBF) is associated with infection with *Anaplasma phagocytophilum* which is an obligate intracellular parasite transmitted by the tick, *Ixodes ricinus*, in the UK and Europe. Infection with the parasite can occur in a wide range of mammalian hosts including humans. The disease is seasonal and associated with the vector feeding activity. More severe disease tends to be seen in naive animals. Clinical signs include pyrexia, depression, lethargy, abortion and milk drop: there is also an indirect affect via increased susceptibility to other infections. Haematology shows thrombocytopenia, neutropenia and lymphopenia.

*This test is not validated.

Endocarditis and concurrent fasciolosis in alpacas

An adult female alpaca, one of two to be found dead from a group of three, was submitted to APHA Starcross for post mortem examination. The most notable findings included ascites, hydrothorax and hydropericardium with severe endocarditis affecting the right ventricle plus enlargement, distortion and darkening of the liver. The findings were suggestive of fasciolosis (this was confirmed on faecal examination) with subsequent endocarditis. Since the beginning of 2010, APHA has diagnosed 11 cases of endocarditis in camelids (10 in alpaca and one in a llama) and in five of these cases it has been in association with fasciolosis. Over the same time period 39 carcasses (27 alpaca and 2 llama) were diagnosed only with fasciolosis.

A previous study by APHA looked at 12 alpacas with endocarditis, nine of which had mural endocarditis involving the right ventricle and in the three remaining animals lesions were seen in the left ventricle. *Fasciola hepatica* eggs were detected in seven alpacas whilst the remaining animals had liver lesions suggestive of fasciolosis. There were no consistent bacteriological findings in the APHA cases with *Escherichia coli* and *Streptococcus* species being recovered in some cases. The latter described study concluded that endocarditis commonly affects the mural endocardium in British alpacas, with valvular involvement probably occurring later in lesion development. It was proposed that chronic fasciolosis may predispose alpacas to mural and later valvular endocarditis by favouring opportunistic bacterial infections in association with endocardial damage caused by toxæmia due to liver damage. It should therefore be borne in mind that endocarditis maybe a life threatening sequel to liver fluke infection.

References

Schock, A., Higgins, R. and Harwood, D. (2009) Mural endocarditis in British alpacas (*Vicugna pacos*) SVP/ECVP Proceedings 307

Yersiniosis in deer

SAC CVS diagnosed septicaemic yersiniosis in a ten-year-old Chinese water deer (*Hydropotes inermis inermis*), which was found dead. Also in the same paddock were 25 Pere David deer which were in good health. On post mortem examination, the carcass was found to be in fair body condition. Multiple dark patches containing numerous pale miliary areas were seen in the congested liver parenchyma. The intestines were also congested with scant, soft contents and the mesenteric and ileo-caeco-colic lymph nodes contained pale gritty material. No acid-alcohol fast bacilli were observed in Ziehl-Neelsen stained

smears prepared from the ileum and affected mesenteric lymph nodes. *Yersinia pseudotuberculosis* was isolated in pure culture from the liver and spleen.

Yersiniosis is one of the most important diseases of farmed deer and often affects young males in their first winter particularly if the weather is cold and wet. The causative organism, *Yersinia pseudotuberculosis* can be found in the intestines of both healthy and affected wildlife and domestic animals. Transmission is by the faecal-oral route, via contaminated pastures, foodstuffs and water supplies. Stress factors such as diet changes, intercurrent disease, handling and transportation can precipitate disease. It can present as sudden death but often animals show severe diarrhoea with rapid loss of condition, dehydration and death. As well as septicaemia and acute enteric disease, subclinical enteric infection, abortion and localised abscessation (external and internal sites) can also occur in a wide range of mammalian and avian species. It should also be noted that this organism is zoonotic and can cause severe enteric disease in man.

HORIZON SCANNING

Cervid spongiform encephalopathy/chronic wasting disease update

Last quarter's Emerging Threats Report (<https://www.gov.uk/government/publications/exotic-and-farmed-species-disease-surveillance-reports-2016>) discussed cervid spongiform encephalopathy in a reindeer (*Rangifer tarandus tarandus*) in the Nordfjella region of Norway: this has since been confirmed by the OIE Reference Laboratory in Canada as Chronic Wasting Disease (CWD) and is the first case in Norway (and Europe) as well as the first in a reindeer. Since this time there have been two further cases both in elk (*Alces alces*) (also known as the North American moose). At the end of May, the Norwegian Veterinary Institute reported a case in the Sør-Trøndelag region of Norway in a free ranging pregnant female elk in poor body condition with abnormal behaviour which was culled. Its location was 450km from the first case in reindeer and there is no known interaction between the ranges and herds. Further to the second case several theories were put forward to attempt to explain the two spatially separate cases including; a single point of introduction of contaminated material with subsequent disease spread between the elk and reindeer populations; two separate introductions of disease into the two regions and populations, longstanding widespread environmental contamination; that abnormal prion proteins have been generated anew in Norwegian deer with subsequent dissemination. The first of these is thought less likely as the two populations affected do not generally interact.

In the middle of June, Norway reported a third case, again in a female elk, and in a similar location to the second case. Samples from the latter two cases tested positive by both ELISA and Western blot tests. Further studies to characterize the Norwegian isolates and compare them with the North American isolates are ongoing.

Unknown factors at present include the distribution of CWD in deer in Scandinavia or other parts of Europe, whether it represents a wider problem in farmed reindeer, in other cervid species and other regions, or if this is restricted to the wild cervids in Southern Norway.

Additional surveillance has been put in place by Norway and a ban on the trade in live cervids has been implemented. In the past a small number of reindeer have been imported into the UK from Norway with the vast majority coming from other Nordic Countries particularly Sweden. The import of deer urine which is used as a hunting lure could also represent a significant pathway although this is illegal within the EU. The Norwegian authorities have produced a risk assessment which suggests that the public health and food safety risk of this disease is very low. There is no suggestion that CWD is zoonotic and natural transmission of disease appears confined to deer species only with no record of spread to other species. The following are links to published reports.

Preliminary outbreak assessment and updated situation assessment for cervid spongiform encephalopathy in reindeer in Norway <https://www.gov.uk/government/publications/cervid-spongiform-encephalopathy-in-norway>

Qualitative risk assessment for the risk of chronic wasting disease being introduced into Great Britain <https://www.gov.uk/government/publications/qualitative-risk-assessment-risk-of-chronic-wasting-disease-being-introduced-into-great-britain>

Chronic wasting disease update from the British Deer Society [Chronic wasting disease update from the British Deer Society](#)

PUBLICATIONS OF INTEREST

Further to the brief discussion regarding atypical myopathy in horses in Emerging Threats: Miscellaneous and exotic species disease: October to December 2014 (<https://www.gov.uk/government/publications/exotic-and-farmed-species-disease-surveillance-reports-2014>) the following article gives a useful update.

Votion, D.M. (2016) Atypical myopathy: an update doi: 0.1136/inp.i1859 In Practice 38: 241-246

Edwards, E.E., Garner, B.C., Williamson, L.H., Storey, B.E. and Sakamoto, K. (2016) Pathology of *Haemonchus contortus* in New World camelids in the southeastern United States: a retrospective review Journal of Veterinary Diagnostic Investigation, Vol. 28(2) 105-109 doi: 10.1177/1040638716628587

A. Stanitznig, A and others (2016) Prevalence of important viral infections in New World Camelids in Austria. Wiener Tierärztliche Monatsschrift 103(3/4) 92-100

Abstract: Although New World Camelids (NWC) are not ruminants, they are susceptible to a number of viral pathogens that are important for ruminants, such as Bovine Herpesvirus 1 (BHV-1), Bovine Viral Diarrhoea Virus (BVDV), Schmallenberg Virus (SBV) and Bluetongue Virus (BTV). They should thus be considered as carriers and reservoirs of these viruses. This study attempted to assess the role of NWC as potential carriers of four viral pathogens and to estimate the potential, risk of infection of other farm animals, especially ruminants. In this study, 447 serum samples from 186 llamas and 261 alpacas were collected, representative of the entire country of Austria. The samples were examined using ELISA, Serum Neutralisation Test (SNT) and PCR. One sample was positive for BHV-1 antibodies (0.2%), one was positive for BVDV antibodies (0.2%), none were positive for BVDV nucleic acids (0%), 323 were positive for SBV antibodies (67.7%) and 53 were positive for BTV antibodies (11.8%). In summary, the two viruses BVDV and BHV-1 currently have a minor role in Austria and the risk that NWC may infect farm animals can be considered low. A relatively high number of NWC were seropositive for BTV and SBV. NWC may act as a reservoir for BTV and SBV and have an important role in the transmission of these viruses.