

# GB Emerging Threats Quarterly Report Miscellaneous & Exotic Farmed Species Diseases



Safeguarding  
public and  
animal health



Quarterly Report: Volume 18 : Q1

January to March 2016



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## Highlights

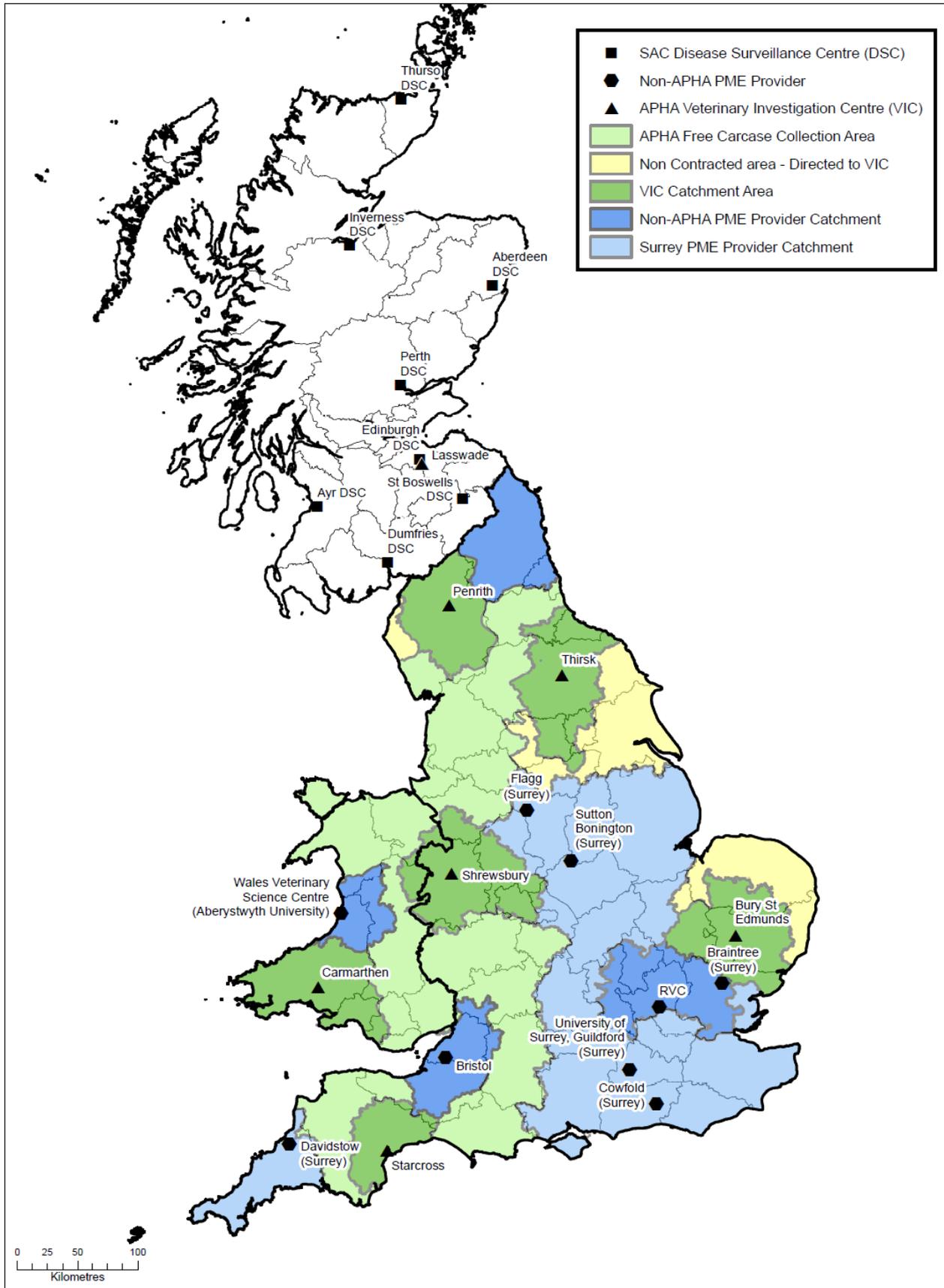
- ***Nematodirus lamae* identified in alpaca in the UK**
- **Multiple follicular cysts in an alpaca**
- **Cervid spongiform encephalopathy in reindeer in Norway**
- **Middle Eastern Respiratory Syndrome (MERS) antibodies in alpaca**

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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 DATE: 04/05/2016  
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Service Provision for Post Mortem Examination  
 & Carcass Collection in England and Wales and  
 SAC Disease Surveillance Centres in Scotland



## 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 first 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>.

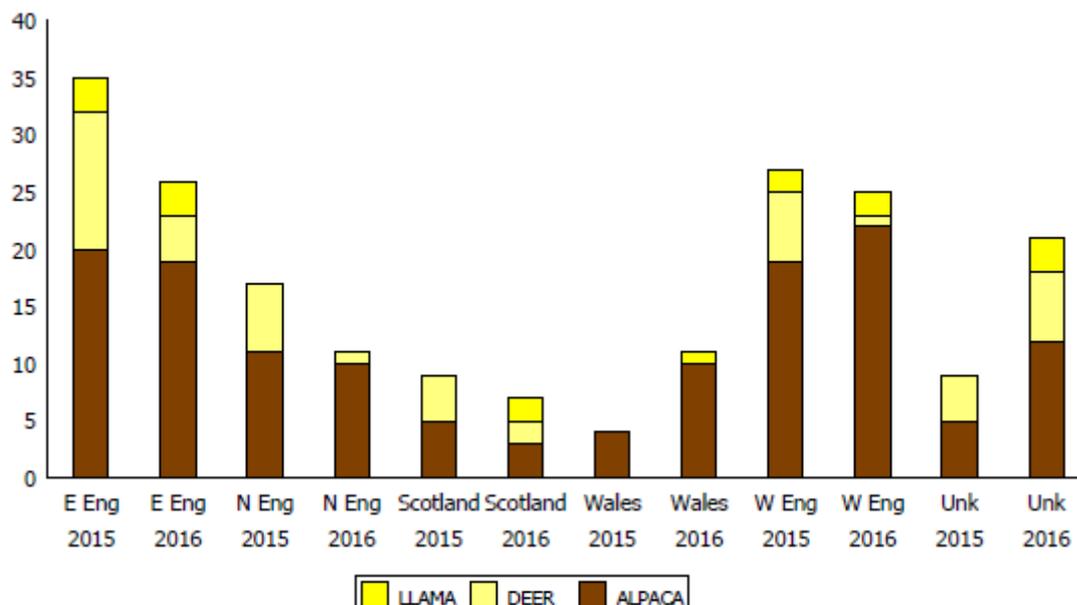
## OVERVIEW

### Diagnostic submission trends

Diagnostic submissions in Quarter 1 (January to March) 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.

Jan to March	Carcase Submissions			Non-Carcase Submissions			GB Total
	APHA	SAC	Total	APHA	SAC	Total	
2012	46	4	50	94	27	121	171
2013	76	8	84	148	18	166	250
2014	46	5	51	92	13	105	156
2015	24	3	27	65	9	74	101
2016	25	2	27	66	8	74	101

GB diagnostic submissions January to March 2015 and 2016



Carcase and non-carcase submission numbers to APHA (including partner post mortem providers) and SAC are almost identical to those in Q1 2015 but are considerably lower than in previous years.

As with this quarter last year the highest number of submissions come from the east and west of England. Overall submissions to most regions decreased this quarter compared to last year but Wales and the unknown region showed an increase. Alpaca submissions increased to Wales, the west of England and the unknown area.

Of the 32 carcase submissions received by APHA and SAC CVS in the first quarter of 2016, 6 have been handled by our partner post mortem providers (PPP).

Quarter 1	Carcase			Foetus/Stillborn			Other			Total		
	2016 Subs	2016 v Prior 2 years	2016 v Prior 5 years	2016 Subs	2016 v Prior 2 years	2016 v Prior 5 years	2016 Subs	2016 v Prior 2 years	2016 v Prior 5 years	Subs	2016 v Prior 2 years	2016 v Prior 5 years
England	24	60%	49%	1	100%	38%	45	65%	51	70	63%	50%
Wales	3	200%	94%				8	145%	100	11	147%	95%
Scotland	2	57%	40%				5	53%	36	7	54%	36%
Unknown	3	300%	167%	1		#DIV/0	14	467%	219	18	450%	220%
	<b>32</b>	<b>70%</b>	<b>54%</b>	<b>2</b>	<b>133%</b>	<b>59%</b>	<b>72</b>	<b>82%</b>	<b>62%</b>	<b>106</b>	<b>79%</b>	<b>59%</b>

A comparison is made to show the percentage of various types of submissions (carcase, foetus/stillborn, other) in Q1 2016 as compared to Q1 2 years and 5 years ago.

It is worth noting that a submission may be comprised of a number of carcasses and therefore the number of carcasses is greater than the number of carcase submissions.

## 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.

There was no evidence from DNR analysis in Q1, 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

### ***Nematodirus lamae* identified in alpaca in the UK**

*Nematodirus lamae* has been identified on two occasions recently by APHA. This is a parasite which has not previously been reported outside South America. The first case involved an 18 month old alpaca (*Vicugna pacos*) that died suddenly at grass and was submitted for post mortem. A total worm count confirmed high numbers of immature parasites within compartment 3 of the stomach and the small intestine as well as smaller numbers of *Haemonchus*, *Ostertagia/Teladorsagia* and *Trichostrongylus* species. *Nematodirus lamae* was also detected in the small intestinal content. As well as *N.lamae* eggs, examination of a faeces sample from this animal also detected 29,140 other coccidial (not *Eimeria macusaniensis*) oocysts per gram and it was concluded that gastro-intestinal parasitism (both nematodes and coccidia) had contributed to the poor condition of this animal. There was no evidence of infection in the other ruminants (goats) on the holding. Although the animal was homebred, other members of the group it was purchased from had imported dams.

In a separate and unrelated case, eggs with the morphology of *N.lamae* were identified in the faeces of an eight-month-old female alpaca, one in a group of eight at grass with a two-day history of malaise and a tendency to lie down.

These findings indicate that *N. lamae* is surviving and completing its lifecycle in alpacas in the UK.

*Nematodirus lamae* is reported to be a parasite primarily of South American camelids (SACs) developing in the small intestinal mucosa before emerging into the lumen. It is likely that *N. lamae* larvae develop to the infectious (L3) stage in the egg on pasture before hatching like the rest of the genus. It is not known if any environmental trigger for hatching is necessary in this species as is seen in *N. battus*. From what is known of other *Nematodirus* species it is likely to be more pathogenic in younger animals. Cross infection with other *Nematodirus* species from cattle and sheep has also been reported in SACs. Nematodes are often not 100% host specific so although there is no evidence that *N.lamae* cross infects other species this possibility cannot be ruled out.

Mitchell S, Hopkins B and Corfield C (2016) *Nematodirus lamae* identified in an alpaca in the UK. *Veterinary Record*; 178:271-272 doi:10.1136/vr.i1411

### **Multiple follicular cysts in an alpaca**

Fixed skin samples from a 15 year old female alpaca with numerous cutaneous lumps were submitted to APHA Shrewsbury for histopathology. Within the dermis, there was a large cystic structure, lined by keratinised, stratified squamous epithelium which contained fragmented keratinised material, with occasional ghost cells. Rarely, multifocally, the adjacent dermis contained small infiltrates of lymphocytes, plasma cells, macrophages and the odd neutrophil. A morphological diagnosis of multiple follicular cysts was made.

Multiple follicular cysts occur occasionally in dogs, sheep, humans and horses and have been reported in alpacas. The aetiology of this condition is unclear. Given that multiple cysts occur in sheep and the reference below describes them in aged (10-15 years) alpacas, the authors suggest that the fibre type or repeated shearing may contribute to the development of these lesions. Other clinical differentials for skin nodules in alpacas include fibromas, fibropapillomas, melanocytomas, trichoepitheliomas, lymphomas, collagenous hamartomas and hair follicle hamartomas.

It is therefore important that biopsies should be performed on all skin masses to confirm the diagnosis.

### **Reference**

Newkirk KM, Frank LA (2011) Multiple follicular cysts in four alpacas (*Vicugna pacos*). *Veterinary Dermatology* June 22 (3):275-8. Doi: 10.1111/j.1365-3164.2010.00943.x

## HORIZON SCANNING

### Cervid spongiform encephalopathy in reindeer in Norway

The Norwegian Veterinary Institute has reported a case of prion disease in free ranging wild reindeer (*Rangifer tarandus tarandus*), in the Nordfjella population of south Norway. The adult doe carcass was submitted for post mortem examination and was tested as part of the national surveillance programme for Chronic Wasting Disease (CWD) in wild ungulates. Prion disease was confirmed in mid-March by both biochemical and immunohistochemical tests. Samples are being sent to the OIE reference laboratory in Canada before confirmation as Chronic Wasting Disease can be made. If confirmed, this would be the first case of Chronic Wasting Disease detected in Europe. Initial experimental research, suggests that human susceptibility to CWD is low and there may be a species barrier preventing CWD transmission to humans. Norway has put in place additional surveillance.

Chronic wasting disease (CWD) is an infectious, progressive nervous disease affecting cervids (deer, elk, moose and caribou). It is one of a group of diseases caused by a prion and known as transmissible spongiform encephalopathies (TSEs) which also includes scrapie and bovine spongiform encephalopathy (BSE) affecting sheep and goats, and cattle respectively. The disease has an incubation period of 18-24 months and therefore most cases tend to be seen in animals aged 3-4 years old although cases have been seen in animals as young as 18 months and up to 13 years of age. Like other TSEs, the clinical signs generally involve a change of behaviour and in posture/movement, and weight loss. Also like any TSE, the disease is notifiable in the UK and suspicion of the condition should be reported to the local APHA office.

### References and further information

<http://www.vetinst.no/eng/Highlights/The-first-detection-of-Chronic-Wasting-Disease-CWD-in-Europe>

There is a preliminary outbreak assessment regarding this issue at the link below:

<https://www.gov.uk/government/publications/cervid-spongiform-encephalopathy-in-norway>

There is an updated risk assessment for the introduction of CWD into the UK particularly with respect to the use of natural deer urine now available at the link below:

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

Chronic wasting disease of cervids was discussed in previous quarterly reports which can be accessed via the below links:

[Emerging threats: miscellaneous and exotic farmed species disease report January to March 2015](#)

[Emerging threats: miscellaneous and exotic farmed species disease report April to June 2015](#)

### Middle Eastern Respiratory Syndrome (MERS) in alpaca

Evidence indicates that dromedaries (*Camelus dromedarius*) are a reservoir for zoonotic transmission of Middle East Respiratory Syndrome coronavirus (MERS-CoV) and although various studies have looked at other livestock, evidence of infection has only been found in dromedaries. This study (Reusken 2016) carried out in Qatar looked at the infection status of healthy alpacas and dromedaries kept on the same farm. Serum samples and various swabs were taken from 15 alpacas and 10 dromedaries. All the alpacas and all but 1 camel were serologically positive and all the swabs were negative by PCR for the virus. The study suggested that alpacas are susceptible to MERS-CoV infection. The authors suggest further studies are needed to determine the potential for alpacas to be another livestock reservoir for MERS-CoV.

In a further study by Gary Crameri and others (2016) which involved 3 experimentally infected alpacas it was shown that alpacas secreted live virus after oronasal infection and that the immune response to the initial infection prevented further excretion following reinfection. The trial assumed that the initial infection equates to natural vaccination and that the lack of viral excretion follows an induced immune memory response. However, the results indicate that this immunologic response is complex; although a strong serologic response developed in only 1 alpaca, all 3 alpacas were refractory to reinfection. The authors state that the study has several limitations - it only involved 3 animals, the observation period of 21 days before re-challenge did not provide complete information on the duration of protective immunity and the study did not seek to understand the pathogenesis of infection and no histopathology or immunohistochemistry was carried out to identify the site of viral replication or the role of mucosal immunity in eliciting an immune response. A larger sample size and a longer period of study post inoculation are needed in future studies.

There is thought to be little risk of importing MERS infected alpacas into the UK as there is no trade with the Middle Eastern countries with regard to alpacas. The majority of South American camelids are imported from Europe and New Zealand.

## References

Reusken CBEM, Schilp C, Raj VS, De Bruin E, Kohl RHG, Farag EABA, et al. (2016) **MERS-CoV infection of alpaca in a region where MERS - CoV is endemic**. Emerging Infectious Diseases due for publication Volume 22, Number 6—June 2016 <http://dx.doi.org/10.3201/eid2206.152113>

Crameri G, Durr PA, Klein R, Foord A, Yu M, Riddell S, Haining J, Johnson D, Hemida MG, Barr J, Peiris M, Middleton DM and Wang L. (2016) **Experimental Infection and Response to Rechallenge of Alpacas with Middle East Respiratory Syndrome Coronavirus** Emerging Infectious Diseases due for publication Volume 22, Number 6—June 2016 <http://dx.doi.org/10.3201/eid2206.160007>

## APHA STAFF PUBLICATIONS on Miscellaneous and Exotic Farmed Species (MEFS) topics (APHA staff in capitals)

MITCHELL S, HOPKINS B and CORFIELD C. (2016) **Nematodirus lamae identified in an alpaca in the UK**. Veterinary Record; 178:271-272 doi:10.1136/vr.i1411

Dudek K; Bednarek D; Szacawa E; AYLING RD; Krzysiak MK; Marczuk J (2015) **A serological and molecular study on the occurrence of mycoplasmas in European bison (Bison bonasus) from two areas of Eastern Poland**. Polish Journal of Veterinary Sciences 18 (4) 881-883.