GB Emerging Threats Quarterly Report

Miscellaneous & Exotic Farmed Species Diseases

Animal & Plant Health Agency

Safeguarding public and animal health

SRUC

Quarterly Report: Volume 18 : Q3 **July to September 2016**

Contents

Highlights

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.

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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 and Wales Veterinary Science Centre) from samples submitted in the third 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

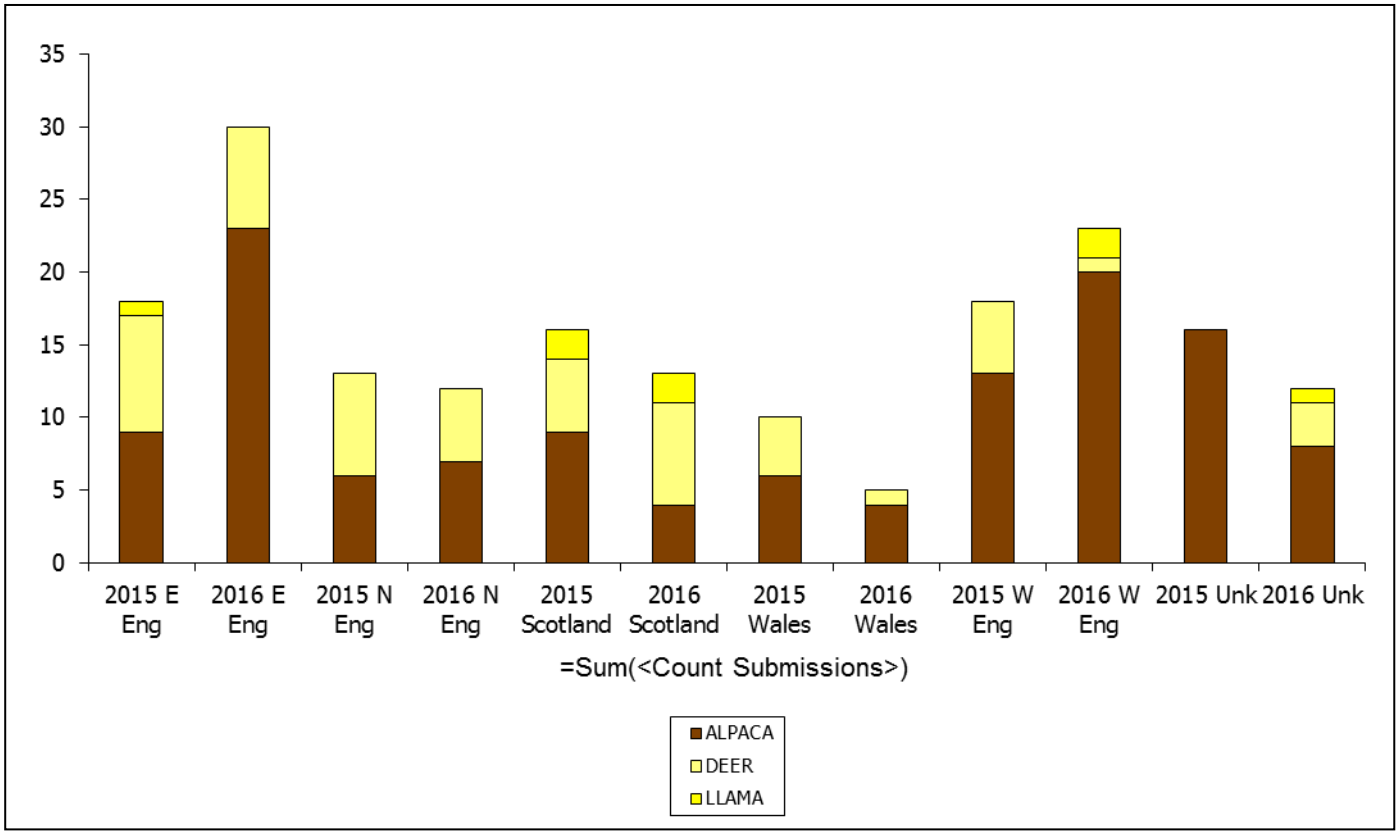
Diagnostic submissions in Quarter 3 (July to September) 2012-2016 for alpacas, llamas and farmed deer – the APHA figures include submissions to partner post mortem providers (PPP) as detailed above. Other miscellaneous and exotic species may also be received in small numbers.

	Carcase Submissions			Non-Carcase Submissions			
July - September	APHA	SAC	Total	APHA	SAC	Total	GB Total
2012	66	2	68	117	13	130	198
2013	26	5	31	76	15	91	122
2014	42	6	48	108	18	126	174
2015	26	2	28	47	16	63	91
2016	29	2	31	46	18	64	95

Total diagnostic submissions for Quarter 3 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	SUMMARY
Eastern England	145	56	12	**213**
Northern England	52	30		**82**
Scotland	37	40	6	**83**
Wales	37	19		**56**
Western England	162	28	9	**199**
Unknown	39	6	2	**47**
Sum:	**472**	**179**	**29**	**680**

GB diagnostic submissions for Quarter 3, July to September for 2015 and 2016



Carcase and non-carcase submissions to APHA (including partner post mortem providers) and SAC CVS are very similar to the same quarter last year suggesting perhaps that numbers have stabilised after the reorganisation of APHA following the Surveillance 2014 review. Carcases numbers are also similar to those seen in 2013. The highest number of submissions came from the east and west of England and both had increased over this quarter last year. Submissions to other regions decreased this quarter compared to last year. The east, north and west of England showed an increase in alpaca submissions whereas Scotland and Wales showed a decrease in alpaca submissions. Alpaca make up the majority of the submissions from all geographic areas with the exception of Scotland where deer, followed by alpaca, predominate.

Of the 35 carcase submissions (see table below) received in the third quarter of 2016, 16 have been handled by our partner post mortem providers (PPP).

Table to show the submissions (carcase, foetus/stillborn, other) to APHA, SAC CVS and 3PPP in Q3 2016 as compared to Q3 in the previous 2 years and previous 5 years.

		Carcase			Foetus/Stillborn			Other			Total		
Q3		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
APHA	APHA	16	68%	48%				46	59%	52%	62	61%	51%
SAC	SAC	3	67%	60%				17	100%	115%	20	93%	101%
3PPP	BRIS	1	100%	250%							1	100%	250%
	LIVP												
	LOND	11	147%	196%							11	147%	177%
	SACPME												
	UNAB												
	UOS	4	800%	2000%							4	800%	2000%
		35	**90%**	**75%**				**63**	**67%**	**61%**	**98**	**73%**	**65%**

Diagnostic submissions for Quarter 3 2012 to 2016 for miscellaneous species by syndrome

	2012		2013		2014		2015		2016		Sum:
Circulatory	3	1%	2	2%	2	1%					7
Enteric	75	37%	36	28%	61	35%	38	39%	17	19%	227
Musculo-skeletal			2	2%	5	3%	1	1%	3	3%	11
Nervous / Sensory	2	1%	7	5%	3	2%	1	1%	1	1%	14
Reproductive	4	2%	3	2%	2	1%	1	1%	3	3%	13
Respiratory	7	3%	7	5%	5	3%	4	4%	3	3%	26
Skin	16	8%	8	6%	11	6%	9	9%	6	7%	50
Systemic & Misc	57	28%	48	37%	54	31%	24	25%	32	35%	215
Urinary	3	1%			3	2%	1	1%			7
Unknown (999,990,	35	17%	17	13%	29	17%	18	19%	26	29%	125
Sum:	202	100%	130	100%	175	100%	97	100%	91	100%	695

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 above with enteric disease dominating in 2012, 2014 and 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 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 2010-2015 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 or DNL (diagnosis not listed) analysis in Q3, 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

Lymphoma in alpaca

Over the last five years VIDA has recorded 21 cases of neoplasia in camelids – 20 in alpaca and a single case in a llama. The age of animal varied from 3 months to 26 years with the majority of cases being over 6 years of age. Lymphoid tumours accounted for 6 cases, adenocarcinomas for 3 cases and 12 cases were unspecified neoplasms which included squamous cell carcinomas, hepatic carcinomas, haemangiosarcomas, fibromas, pulmonary carcinomas and mixed cell type tumour.
A 10-year-old alpaca from a group of five died after a short period of respiratory signs and mucopurulent nasal discharge. A post mortem examination was carried out at the Royal Veterinary College. All lymph nodes in the thoracic cavity were markedly enlarged, showed patchy pallor and were firm with central yellow necrosis. The liver had a mottled surface and showed diffuse pale infiltrates throughout. No acid fast organisms were detected on Ziehl–Neelsen stained impression smears or on histopathology of the affected tissues. However a histological diagnosis of lymphoma was made. This case illustrates the importance of reaching a definitive diagnosis as grossly this neoplasm, particularly the lymph nodes, presented with a very similar appearance to mycobacteriosis which, if suspected, is notifiable.
A study carried out by Oregon State University between 2001 and 2006 looked at the prevalence of neoplasia in camelids in 551 submissions. The prevalence of neoplasia in llamas was higher (11%) than in alpacas (4.9%). The mean age of camelids with neoplasia was 9.42 ± 4.9 years. The mean age of alpacas with neoplasia (5.48 ± 3.7 years) was significantly less than of llamas with neoplasia (12.53 ± 3.2 years). Cutaneous and mucocutaneous fibroma/fibropapilloma was most common (10 animals), followed by cutaneous and mucocutaneous squamous cell carcinoma (6 animals), disseminated

lymphoma (5 animals), and fibrosarcoma (4 animals). The paper concludes that neoplasia is relatively common in camelids and that important differences exist regarding prevalence, tumour type and age.

Reference

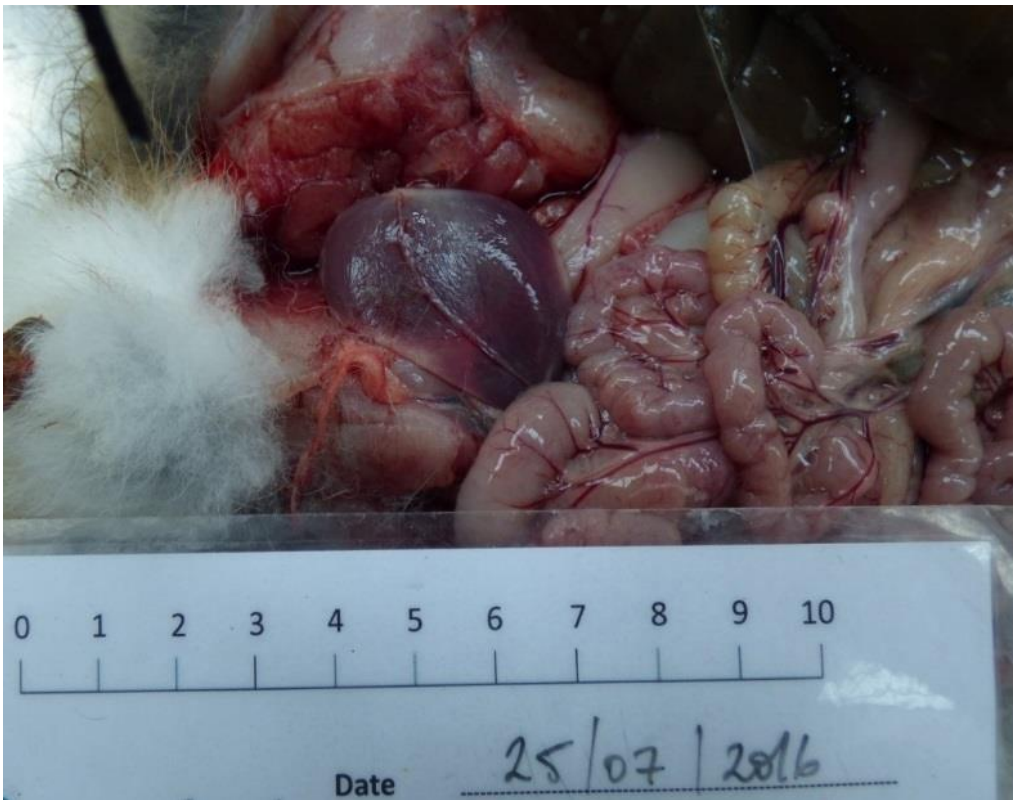
Valentine, B.A. and Martin, J.M. (2007) Prevalence of neoplasia in llamas and alpacas (Oregon State University, 2001–2006) Journal of Veterinary Diagnostic Investigation 19:202–204

Clostridial disease in alpaca

Clostridial perfringens type D enterotoxaemia was diagnosed twice this quarter in camelids with both cases involving yearling alpacas. In one case seen by the SAC CVS, *Clostridium perfringens* type D disease was diagnosed in an eleven-month-old male Huacaya alpaca (*Vicugna pacos*) that died suddenly three days after transport from another holding. The other alpaca that had moved with the affected animal was said to be healthy: both had received clostridial vaccine boosters earlier in the year although the earlier vaccination history was unknown. Body condition was poor and there were multiple necrotic ulcers, up to 0.5 cm in diameter, in the C3 compartment of the stomach. There were a few fibrin strands in the abdomen and a large volume of lush grass fibre in the stomachs. Two localised sections of small intestine showed congestion and blood stained content and the kidneys appeared swollen and slightly pale. Congested lungs and a profuse pericardial effusion with a gelatinous fibrin clot were also observed. No epsilon toxin was detected in the small intestinal contents. Histological examination of the brain showed oedema characterised by perivascular serum leakage into the white matter, changes which supported a diagnosis of focal symmetrical encephalomalacia/*Clostridium perfringens* type D disease.
It was suggested by the examining private veterinary surgeon that the animals had been moved to much lusher pastures prior to the development of this condition. This change, as well as grain overload, is a potentially important predisposing factor to the development of this condition.

Rabbit Haemorrhagic Disease (RHD)

The University of Bristol Farm Animal Pathology Service reported a case of Rabbit Haemorrhagic Disease Virus type 2 (RHDV2) in a long established rabbit breeding unit supplying meat for human and canine consumption. Up to 36 rabbits from a group of 100 aged between four and twelve weeks of age had died over a four day period with some young rabbits showing lethargy/depression before death. Breeding does were unaffected. No routine vaccines were administered. The rabbits were kept as a herd in a large open barn with potential access to wild rabbits through a fence.
Post mortem examination of two carcases (4 and 12 weeks old) identified lungs that were uniformly slightly darker than normal with several small focal areas of haemorrhage on the surface of the caudal lobes. The kidneys were slightly darker than normal and one rabbit had a moderate amount of red cloudy urine in the bladder (see image below). Histopathological findings in both rabbits included evidence of diffuse multifocal hepatocellular necrosis without a distinct zonal pattern. In one rabbit there was a marked glomerulonephropathy with microthrombi in capillaries. Pulmonary disease with variably extensive collapse and low grade alveolar pneumonia was present in both animals. The changes in the liver and kidney were consistent with RHD and disseminated intravascular coagulopathy. RHD PCR testing of the liver was carried out at the Moredun Research Institute Virus Surveillance Unit and demonstrated the presence of RHDV type 2.



Red urine in bladder of rabbit with RHDV2

Rabbit Haemorrhagic Disease update

Rabbit Haemorrhagic Disease virus (RHDV) was identified in 1984 and phylogenetic analyses of pathogenic RHDV strains identified three distinct groups: classical RHDV isolated from 1984, the antigenic variant RHDVa in 1996, and RHDV2 identified in 2010. RHDV and RHDVa are phylogenetically related and differ antigenically from RHDV2 which may be considered a distinct serotype. Since its first identification in France in 2010, RHDV2 has spread throughout Europe replacing the circulating RHDV/RHDVa strains in most European countries. No cases of RHDV/RHDVa (sometimes referred to as RHDV1) have been reported by APHA since 2009.

RHDV affects wild and domesticated members of the species *Oryctolagus cuniculus*, the European rabbit. European brown hares (*Lepus europaeus*) and other hare species (*L. timidus, L. corsicanus, L. capensis*) are not affected by RHDV/RHDVa classical strains. However RHDV2 has been shown to infect and cause a RHDV-like disease in at least two species of hares, i.e. the Sardinian cape hare (*L. capensis* var *mediterraneus)* and the Italian hare *(L. corsicanus).* Among hare species, *Lepus europaeus, L. timidus* and *L. corsicanus,* are affected by a disease caused by a different lagovirus - European brown hare syndrome (EBHS). Virus replication has not been reported in other mammals.

Disease caused by RHDV/RHDVa is characterised by a morbidity of up to 100% and a mortality rate of 80–90% with the highest rates seen in adult rabbits in naïve populations. Death occurs 12-36 hours after the onset of pyrexia. Very young rabbits are unaffected and in those less than 6-8 weeks the infection is likely to be subclinical. The highest morbidity and mortality rates are seen in adult rabbits from naïve populations. The mortality rate for RHDV2 is more variable (from 5 to 70% with an average mortality of 20%). In contrast to RHDV/RHDVa, disease and mortality associated with RHDV2 can occur even in young animals from 15–20 days old onwards and the course of the disease is usually longer (3–5 days), with more rabbits showing sub acute - chronic signs and lesions. The spread of RHDV2 may be facilitated by its apparent slower disease progression compared to RHDV/RHDVa.

The only vaccine available with a UK license does not appear to protect against RHDV2 but vaccines have been or are undergoing licensing in the EU against this strain and will require a special import license or special treatment certificate from the Veterinary Medicines Directorate (VMD) in order to use

them in this country. Further information on vaccination can be obtained from the Rabbit Welfare Association.

References

New variant Rabbit Haemorrhagic Disease in farmed rabbits in Emerging threats: miscellaneous and exotic farmed species disease report July to September 2015 https://www.gov.uk/government/publications/exotic-and-farmed-species-disease-surveillance-reports-2015

Rabbit haemorrhagic disease OIE Technical Disease Card and World Animal Health Information System (WAHIS) http://www.oie.int/en/animal-health-in-the-world/technical-disease-cards/

Rabbit Welfare Association http://www.rabbitwelfare.co.uk/

McGowan, S. and Choudhury, B. (2016) Update on rabbit haemorrhagic disease virus *Veterinary Record* 2016 178: 662-663 doi: 10.1136/vr.i3449

HORIZON SCANNING

Cervid Transmissible Spongiform Encephalopathy (TSE) update

In March 2016 the Norwegian Veterinary Institute reported prion disease in a wild, adult reindeer (*Rangifer tarandus tarandus)* cow which was found moribund and died. It was tested as a routine sample for the national surveillance programme for Chronic Wasting Disease (CWD) and prion disease was confirmed by both biochemical and immunohistochemical tests. Samples were sent to the OIE reference laboratory (Canada). Based on the widespread distribution of the TSE prion protein in the brain and the case history it was concluded that the animal had a spongiform encephalopathy compatible with CWD in the early clinical stage. This was the first case of transmissible spongiform encephalopathy (TSE) found in a cervid in Europe and the first ever TSE case in a reindeer or caribou. The animal was found in the Nordfjell region. The following month, two further cases were reported in wild moose (*Alces alces*), in the Sør-Trøndelag region, approximately 300km from the first case, which again tested positive for TSE prion protein. In a fourth case, in August 2016, a healthy reindeer bull was shot and also tested positive as part of a surveillance programme, again in the Nordfjell region and a fifth case, again in a reindeer cow shot by hunters in the same region was detected in September 2016. The new risk assessment (link below) looks at the routes of possible entry of cervid TSE into Great Britain from Norway.

Reference

What is the risk of cervid TSE being introduced from Norway to Great Britain? (September 2016) https://www.gov.uk/government/publications/qualitative-risk-assessment-risk-of-chronic-wasting-disease-being-introduced-into-great-britain?platform=hootsuite

PUBLICATIONS OF INTEREST (APHA staff in capitals)

Benestad SL; Mitchell G; SIMMONS M; Ytrehus B; Vikoren T (2016) **First case of chronic wasting disease in Europe in a Norwegian free-ranging reindeer.** *BMC Veterinary Research 47:88* http://dx.doi.org/10.1186/s13567-016-0375-4

Dagleish, MP. **Chronic wasting disease of deer – is the battle to keep Europe free already lost?** (2016) Veterinary Record 179: 121-123 doi: 10.1136/vr.i4165

Green, P. **Chronic wasting disease - the Norwegian cases.** (2016) Journal of the British Deer Society Vol 17, Issue 10, pages 16-18