GB Emerging Threats Quarterly Report
Miscellaneous & Exotic Farmed Species Diseases

Quarterly Report: Volume 19 : Q2 April to June 2017

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Highlights

- Haemonchosis alert in camelids
- Unusual soft tissue sarcoma in alpaca
- Suspect Chronic Wasting Disease in reindeer
- Adenovirus Haemorrhagic Disease in cervids

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 second quarter of 2017 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) 2013-2017 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.

<table>
<thead>
<tr>
<th>April to June</th>
<th>APHA</th>
<th>SAC</th>
<th>Total</th>
<th>APHA</th>
<th>SAC</th>
<th>Total</th>
<th>GB Total</th>
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<td>2013</td>
<td>38</td>
<td>11</td>
<td>49</td>
<td>73</td>
<td>11</td>
<td>84</td>
<td>133</td>
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<tr>
<td>2014</td>
<td>23</td>
<td>5</td>
<td>28</td>
<td>72</td>
<td>9</td>
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<td>2015</td>
<td>13</td>
<td>6</td>
<td>19</td>
<td>81</td>
<td>9</td>
<td>90</td>
<td>109</td>
</tr>
<tr>
<td>2016</td>
<td>14</td>
<td>4</td>
<td>18</td>
<td>64</td>
<td>9</td>
<td>73</td>
<td>91</td>
</tr>
<tr>
<td>2017</td>
<td>34</td>
<td>8</td>
<td>42</td>
<td>31</td>
<td>20</td>
<td>51</td>
<td>93</td>
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</table>

Carcase submissions this quarter to APHA (including PPP) are greater than in the previous three years and comparable to those in 2013 whilst non carcase submissions are at the lowest level over the five years given above. SAC CVS numbers have traditionally been lower than APHA but both the carcase and non-carcase submission numbers are higher than in the previous three and, in the case of non-carcase submissions, higher than the previous four years. It maybe that some of the non-carcase submissions previously being sent to APHA are now being handled by SAC CVS.
Total diagnostic submissions for Quarter 2 for all years (2013-2017) for each main species covered by this report and also for each main geographical area.

<table>
<thead>
<tr>
<th>All Years</th>
<th>ALPACA</th>
<th>DEER</th>
<th>LLAMA</th>
<th>SUMMARY</th>
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</thead>
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<tr>
<td>Eastern England</td>
<td>124</td>
<td>32</td>
<td>8</td>
<td>164</td>
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<tr>
<td>Northern England</td>
<td>47</td>
<td>22</td>
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<td>Scotland</td>
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<td>71</td>
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<tr>
<td>Wales</td>
<td>25</td>
<td>6</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td>Western England</td>
<td>106</td>
<td>25</td>
<td>13</td>
<td>144</td>
</tr>
<tr>
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<td>41</td>
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<td>4</td>
<td>51</td>
</tr>
<tr>
<td>Sum:</td>
<td>375</td>
<td>125</td>
<td>35</td>
<td>535</td>
</tr>
</tbody>
</table>

Eastern and Western England has seen the greatest number of total submissions covered by this project over the last 5 years and these regions have also seen the greatest number of alpaca submissions reflecting their distribution throughout the country. Scotland followed closely by Eastern England then Western and Northern England has seen the most deer related submissions.

GB Diagnostic Submissions April - June 2016 and 2017
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 (diagnosis not reached) or DNL (diagnosis not listed) analysis in Q2 2017, of new and (re)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

Haemonchosis alert in cameldids

APHA Thirsk VIC diagnosed haemonchosis as the cause of death in a three-year-old female alpaca with signs of wasting before death. Eleven animals from a group of 38 had died with three deaths occurring the week before submission. The carcase was pale with watery blood, subcutaneous oedema, ascites and hydropericardium. A worm egg count identified 9750 trichostrongyle type eggs per gram of faeces and a total worm count identified 4500 *Haemochus species* in compartment 3 of the stomach. The heavy *Haemochus species* burden would account for the signs of anaemia and hypoproteinaemia identified at post mortem examination. This is an unusual time of year to see this disease and is likely to reflect the recent warm weather. There is also the possibility of maturation of hypobiotic larvae picked up last grazing season. Urgent worming and monitoring of the group was advised. The condition has also been diagnosed in yearling alpaca submitted to Starcross in May and June this year.

Unusual soft tissue sarcoma in alpaca

A mass removed from a distal leg of an eight-year-old castrated alpaca was submitted to APHA for histopathological examination. It was the only animal to be similarly affected from a group of 10 alpacas. The animal had presented with multiple slow growing, proliferative growths on the distal limb. The histology revealed a low grade soft tissue sarcoma very likely arising from a mesenchymal lineage. Due to the cell type, number and distribution of the lesions, the most likely diagnosis was a peripheral nerve
sheath tumour (PNST) which because of the presence of multiple lesions it was suggested this may be a case of neurofibromatosis (multiple PNSTs). PNSTs are uncommon in domestic animals, being reported most often in dogs and cattle, infrequently in cats and horses and rarely in other species such as goats, pigs and birds. PNSTs in animals most frequently affect the peripheral nerves, cranial nerves and spinal roots but may occur at other locations (e.g. bladder) and are usually found in the skin of the head, neck or limbs. Neurofibromatosis in humans is due to a genetic mutation with approximately half of the cases having a hereditary component with the remaining cases occurring as a spontaneous mutation.

Over the last five years VIDA has recorded 19 cases of neoplasia in camelids – all in alpaca. The age of animal varied from 6 to 26 years with 63% (12/19) of cases being over 10 years of age. Lymphoid tumours accounted for 5 cases, adenocarcinomas for 3 cases and there were 4 cases of other type of carcinomas (pulmonary, squamous cell, hepatocellular and pituitary). The other 7 submissions included single occurrences of splenic haemangiosarcoma, fibroma, fibropapilloma and a mixed cell type tumour plus a further 3 submissions in which the tumour type was not definitively diagnosed. For anyone with an interest in neoplasia in SAC, the review paper below details a study carried out by Oregon State University between 2001 and 2006.


**Suspect Chronic Wasting Disease (CWD) in reindeer**

An eight-year-old male reindeer, imported several years ago, was submitted for post mortem examination in order to investigate wasting. Due to the submitting practitioner’s concern over Chronic Wasting Disease (CWD), the initial diagnostic investigations were limited, however testing for this notifiable condition was undertaken and was ruled out. The animal was in poor body condition with serous atrophy of the fat, submandibular oedema, gingival ulceration and liquid faeces. Testing progressed after Notifiable disease was negated and testing for salmonella, Bovine Viral Disease Virus, Malignant Catarrhal Fever and Johnes disease all gave negative results. Liver copper levels were within the normal range. A light to moderate Ostertagia species and Trichostrongylus axei burden were found in the abomasum on a total worm count. Kidney and intestinal tract were examined histologically and a chronic abomasitis was identified but unfortunately tissues were too autolysed for further meaningful examination. Blood samples taken prior to euthanasia showed hypoalbuminaemia and an eosinophilia both of which would be consistent with endoparasitism given the lack of other significant findings and the results of parasitological examinations.

It should be noted that if the clinical signs, history and relevant laboratory testing fail to yield a diagnosis in cases of chronic ill thrift, the possibility of Chronic Wasting Disease (CWD) should be considered. Suspect cases of CWD should be reported to APHA: further details are available through the following link [https://www.gov.uk/guidance/chronic-wasting-disease](https://www.gov.uk/guidance/chronic-wasting-disease). CWD, a transmissible spongiform encephalopathy (TSE) of deer, elk and moose, is a notifiable disease and is not thought to be present in the UK.

**HORIZON SCANNING**

**CHRONIC WASTING DISEASE UPDATE IN NORWAY**

Norway has reported a further reindeer testing positive for Chronic Wasting Disease (CWD) in the Nordfjella area where a culling programme is now underway. The animal was captured alive and
samples taken from intestinal lymph tissue. The reindeer itself was then released with a radio-tag and will be recaptured and humanely destroyed.

Further updates and risk assessments on CWD in Norway can be found on the Norwegian Food Safety Authority webpages – select language English link below:

https://www.mattilsynet.no/language/english/

ADENOVIRUS HEMORRHAGIC DISEASE IN CERVIDS IN OREGON, USA

An outbreak of adenovirus hemorrhagic disease (AHD) in a local deer herd in The Dalles area of Oregon has been reported by the Oregon Department of Fish and Wildlife and residents are being asked not to feed or provide water for the animals and that any carcasses found on their property are disposed of in the correct manner. Several reports of deer dying have been received recently and the state laboratory has diagnosed AHD as the cause of the deaths. AHD is a virus easily transmitted by direct animal to animal contact or contact with body fluids, making transmission easier in areas of high deer concentrations. This is particularly a concern where people feed and water deer since it concentrates them in a small area. Deer with AHD have clinical signs that can include rapid or open mouth breathing, foaming or drooling at the mouth, diarrhea (possibly bloody), weakness and emaciation. Death can occur within 3-5 days from the time the deer are exposed to the virus. If the animals survive the acute stage, a chronic condition may develop which presents with abscesses and ulcers throughout the oropharynx and upper alimentary tract.

Previous outbreaks have occurred in other parts of Oregon. The disease has killed several thousand animals in California and has also been seen in Wyoming and Iowa. This particular adenovirus is capable of infecting both wild and captive cervids and was first recognized in Californian deer around 1994. The virus is closely related to bovine adenovirus-3 but it does not cause disease in animals other than deer. AHD has not been reported in Europe or European species of deer.

Reference:
Pro-MED PRO/AH> Adenovirus hemorrhagic disease, cervids - USA: (OR) Published 2017-06-25
Archive Number: 20170625.5129295 http://www.promedmail.org/

Oregon Department of Fish and Wildlife - Adenovirus Hemorrhagic Disease of Deer
http://www.dfw.state.or.us/wildlife/health_program/andevirus/

PUBLICATIONS OF INTEREST (APHA staff in capitals)


This letter gives a brief overview of rumen fluke in cattle, sheep and South American Camelids (SAC) in the UK. The species involved, the life cycle including the intermediate hosts are discussed, as well as cases where the parasite has been identified in SAC. It is emphasised that where the parasite is identified in either an ill thriven animal or in one showing diarrhoea, listlessness or anorexia other causes of these signs such as salmonellosis, coccidiosis, worms, liver fluke and Johne’s disease should be investigated before assuming disease is due to rumen fluke.

Mycobacterium avium subspecies paratuberculosis (MAP) is the causative agent of Johne’s disease or paratuberculosis, an infectious bacterial disease characterised by granulomatous enteritis, diarrhoea, loss of bodyweight and death. The primary hosts are domestic ruminants such as cattle, sheep and goats but there are also individual case reports of Johne’s disease in llamas (Lama glama) and alpacas (Vicugna pacos).

The increasing importation of llamas and alpacas from different countries, as well as the frequent transfer of animals between herds, can easily lead to a spread of diseases within the population. New World camelids may therefore pose a risk for transmission of MAP to cattle and other domestic animals. The hepatitis E virus (HEV) causes hepatitis E in people and is an important public health concern in many parts of the world. The aim of this study was to evaluate the prevalence of MAP in llamas and alpacas in Austria to determine the risk for the spread of Johne's disease both in New World camelids and to other ruminants. The role of New World camelids as possible carriers of HEV was also examined. This study’s main conclusions were that although not a major pathogen, MAP is distributed among the population of New World camelids in Austria to a certain extent and might pose a possible risk for infection to other domestic and wild ruminants. Testing of New World camelids for MAP should be considered particularly in cases of clinical signs of Johne’s disease and also during control programmes for other ruminant livestock. The results also indicate that New World camelids in Austria are not infected by HEV and so do not appear to pose a risk for transmission of HEV to people.


Listeriosis is a disease of humans and domestic mammals (mainly ruminants) which can present as encephalitis, septicemia, abortion and gastro-intestinal disease. Although Listeria monocytogenes readily causes illness in ruminants, the prevalence among domestic South American camelids (llamas and alpacas) is low and it has not been documented in vicuna and guanaco. This paper describes the clinical signs, post mortem findings and histopathology of septicemia and suppurative meningoencephalitis caused by L. monocytogenes in two neonatal llamas (Llama glama) from the same herd.


Mycoplasma bovis is emerging as an important pathogen of farmed bison in North America and is associated with high morbidity and mortality in affected herds. The aims of the study were to estimate the seroprevalence against Mycoplasma species in bison herds with or without past history of M. bovis–associated disease, and to determine potential risk factors for seropositivity to Mycoplasma species in farmed bison in western Canada. A total of 858 serum samples were collected from bison greater than 1-year of age from 19 bison herds. The individual and herd-level seroprevalence of Mycoplasma spp. was 12% and 79%, respectively. The proportion of seropositive animals was 0–41% and 0–9% for herds with or without a history of M. bovis–associated disease, respectively. Mycoplasma species appear to be widespread in bison in Manitoba, Saskatchewan, and Alberta. Eight of 11 herds with no history of M. bovis–associated disease were seropositive for Mycoplasma species, which suggests that bison can be subclinically infected with Mycoplasma species, or that infection may be underdiagnosed.

The results of this study found that that Mycoplasma bovis is associated with high morbidity and mortality rates in farmed bison, affecting mostly cows greater than 3 years old and yearlings, particularly among large operations and those in Alberta. Mycoplasma bovis appears to be an emerging pathogen of farmed bison in western Canada and merits further investigation so that effective prevention and control strategies can be developed and implemented.


This work describes a simple and rapid test for field detection of the emerging rabbit pathogen RHDVb. The assay is specific for RHDVb, showing no cross-reactivity with other RHDV types giving a specific result in under 10 min using rabbit liquid exudates or liver homogenate samples taken at necropsy.