Great Britain miscellaneous and exotic farmed species quarterly report

Disease surveillance and emerging threats

Volume 32: Quarter 1 of 2022 (January to March)

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Introduction and overview

This quarterly report reviews disease trends and disease threats for the first quarter of 2022 (January to March).

It contains analyses carried out on disease data gathered from the Animal and Plant Health Agency (APHA), SRUC Veterinary Services division of Scotland's Rural College (SRUC) and partner post mortem providers and intelligence gathered through the Miscellaneous and Exotic Farmed Species Expert Group networks.

In addition, links to other sources of information including reports from other parts of the APHA and Defra agencies are included. A full explanation of how data is analysed is provided in the annexe available on GOV.UK.

Issues and trends

New postmortem providers join APHA's Scanning Surveillance Network in England and Wales

The APHA's postmortem examination and diagnostic testing service provides a major component of the Great Britain scanning surveillance network. The network works closely with vets and farmers to detect and investigate new or re-emerging disease and diagnose endemic diseases in farm animals.

The APHA Surveillance Intelligence Unit and Surveillance and Laboratory Services Department were very pleased to announce that during January and February 2021, 3 additional postmortem examination (PME) providers have joined the scanning surveillance network. These are the Universities of Cambridge, Liverpool and Nottingham.

This broadens the expertise of, and contributors to, livestock disease surveillance in England and Wales and also brings livestock premises in the areas they cover closer to a postmortem provider.

The new PME providers join the 7 current PME providers: the Royal Veterinary College, the Universities of Surrey, Bristol, Cambridge and Liverpool, the Wales Veterinary Science Centre, and SRUC Veterinary Services St Boswells that work together with the 6 APHA Veterinary Investigation Centres (VICs), all of which will continue their valued contribution to scanning surveillance.

Key points about accessing PME in APHA's scanning surveillance network:

- each PME provider has an assigned area as shown in colour on the APHA scanning surveillance network
- within each assigned area, the hatched area shows where premises are eligible for free carcase collection and delivery of animals to the PME provider
- premises within non-hatched areas need to arrange to deliver animals themselves

- the postcode search tool identifies and provides contact details for the allocated PME provider and indicates if the premises is eligible for free carcase collection. This is based on the postcode of the premises from where an animal is to be submitted rather than a veterinary practice
- to arrange a PME, the vet calls the relevant PME provider to speak to the duty Veterinary Investigation Officer (VIO) or vet
- there will be some livestock premises for which the allocated PME provider has changed, and the free carcase collection service may no longer be provided for some holdings. The APHA postcode search tool allows farmers and vets to see the situation for individual premises

More information about APHA's scanning surveillance and diagnostic services is available on Vet Gateway and in the attached farmer and vet information leaflets which include a map showing the PME sites.

Please do let me know if you have queries which are not addressed in this communication or contact the APHA Surveillance Intelligence Unit by emailing SIU@apha.gov.uk.

Diagnostic Submission Data

The number of diagnostic submissions in quarter 1 of 2022 (January to March) for alpacas, llamas and farmed deer (see Table 1). The APHA figures include submissions to partner post mortem providers (PPP). Other miscellaneous and exotic species may also be received in small numbers.

Carcase and non-carcase submissions for the same quarter (January to March) for period 2018 to 2022 are shown in Figure 1.

Table 1: Diagnostic submissions in quarter 1 (January to March) for alpacas, llamas and farmed deer

January to March	Non-carcase submissions APHA	Non-carcase submissions SAC	Total non-carcase submissions	Carcase submissions APHA	Carcase submissions SAC	Total carcase submissions	Grand total
2018	28	15	43	36	16	52	95
2019	15	20	35	25	9	34	69
2020	25	7	32	25	5	30	62
2021	13	15	28	23	10	33	61
2022	26	29	55	26	2	28	83

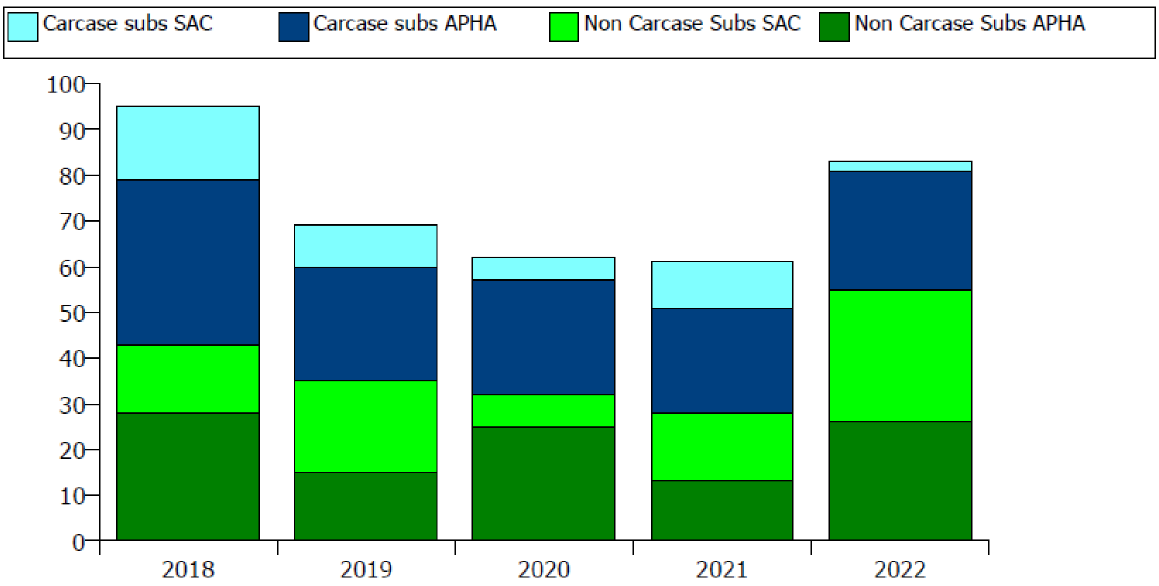

Figure 1: Diagnostic submissions in quarter 1 (January to March) for alpacas, llamas and farmed deer in a graph

Total diagnostic submissions for quarter 1 for all years (2018 to 2022) for each main species covered by this report and also for each main geographical area (see Table 2).

Table 2: Total diagnostic submissions for quarter 1 for all years (2018 to 2022) in the different geographical areas

Area	Alpaca	Deer	Llama	Area total
Eastern England	56	20	2	78
Northern England	41	8	5	54
Scotland	46	44	3	93
Wales	19	7	2	28
Western England	51	15	5	71
Unknown	37	4	5	46
Great Britain Summary	250	98	22	370

New and re-emerging diseases and threats

Nothing to report this quarter.

Diagnoses from the Great Britain scanning surveillance network including unusual diagnoses

Camelids

Parasitic gastroenteritis in an alpaca

An emaciated 8-month-old alpaca had a 6-day history of recumbency prior to death. The alpaca was housed in a group of 12 others, 3 of which had also died. Moxidectin anthelmintic had been given in both January and February 2022. The alpacas' daily diet consisted of ad lib haylage, one handful of alpaca mix, a handful of alfalfa alpaca pellets twice daily and a handful of GP crunch. Alfalfa was given in the morning and at night.

Significant PME findings:

- the alpaca was emaciated and no fat was visible in the carcase
- there was a subcutaneous oedema on the ventral abdomen
- C1 and C3 contained dry fibrous content and there was pelleted content in the rectum

Parasitology

Table 3: Worm egg count and gastrointestinal wash results

Test	Alpaca (Faeces)	Alpaca (GI tract)
Sample Consistency	Soft	
Abo/C3 Comment twc		No worms seen
SI - Immature / L4 twc		200
Trichostrongyle-type eggs (per g)	440	
Eimeria macusaniensis oocysts (per g)	Less than 10	
Other coccidia oocysts (per gram)	Less than 10	

A significant worm burden was demonstrated based on the worm egg count result (see Table 3).

The history obtained indicated the alpaca had been last treated with moxidectin 7 days earlier. It was suggested the treatment history should be checked including the dose given, route of administration and date of treatment.

It was also indicated that anthelmintic resistance should be considered along with the possibility of an adverse event (lack of efficacy) regarding the anthelmintics used.

In addition to this, it was advised that the diet fed should be reviewed including whether a handful of the various concentrate feeds three times daily is sufficient for these animals. No other lesions to explain the emaciation were found.

Tuberculosis in an alpaca

An alpaca carcase was received in emaciated body condition with no body fat visible. Multiple extensive calcified lesions were present in the majority of the lung lobes with minimal normal lung tissue remaining (see Figure 2). *Mycobacterium bovis* was cultured from affected tissue.

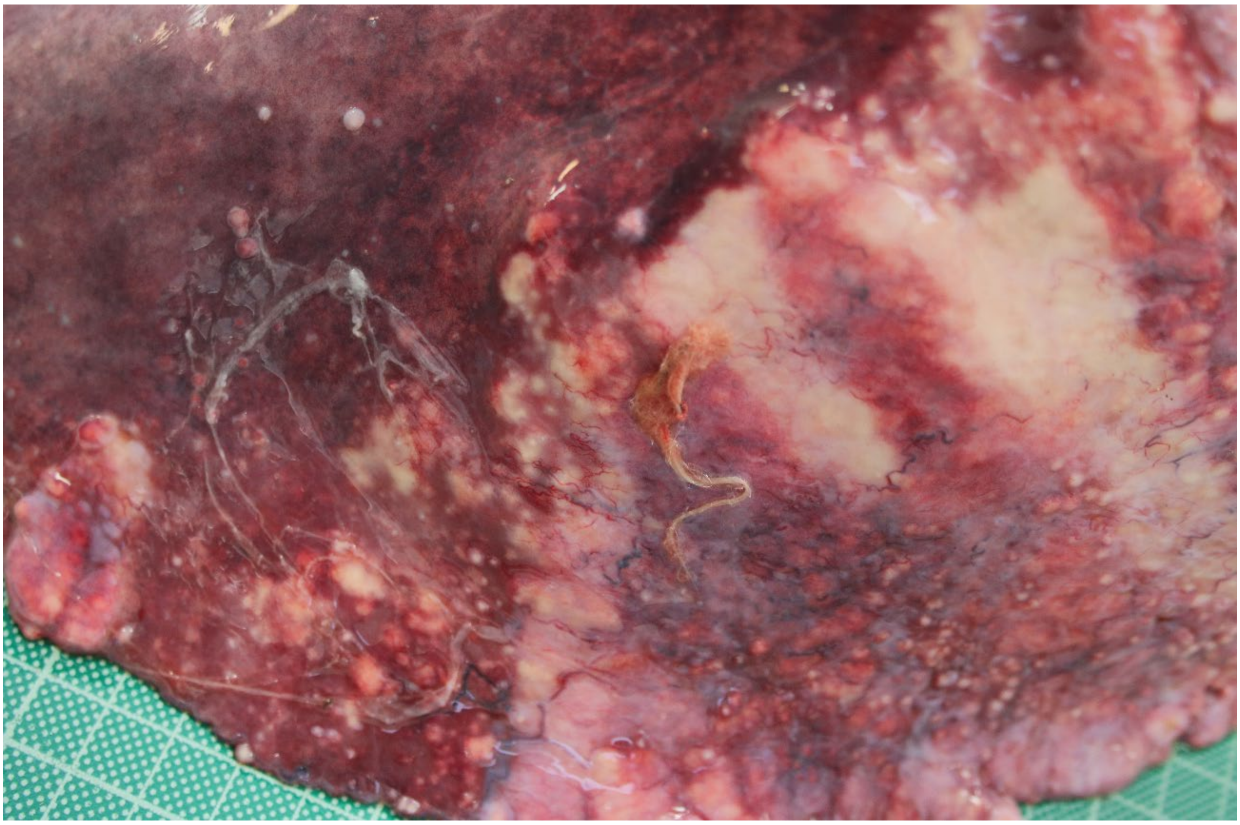

Figure 2: Alpaca lung with confirmed tuberculosis infection

Dental disease in an adult alpaca

The carcase of a 12-year-old adult male alpaca was submitted from a small herd of 10 alpacas after being found dead with no premonitory clinical signs reported.

The alpacas were at pasture with access to a field shelter and given supplementary hay and concentrates. Vaccinations for clostridial disease were up to date and they had been wormed a few months previously.

Postmortem examination revealed this animal to be in poor condition with minimal carcase fat, no peri-renal fat and gelatinous coronary fat, consistent with chronic weight loss over a protracted time period, rather than an acute disease process.

Involvement of Johne's disease and parasitic gastroenteritis were ruled out on laboratory testing.

It was noted that the molars in this animal were extremely worn, and dental disease was therefore deemed most likely the cause for the weight loss and poor condition identified grossly. Dental disorders are relatively common in camelids, particularly the cheek teeth in older animals. A good review has been recently published (1,2).

Endoparasitism and mange in an alpaca cria

Two 6-month-old, weaned alpaca cria from a group of 50 died following signs of malaise and wasting. The group had moved to new pasture three weeks prior to death.

Anticoccidial was administered at eight weeks of age and levamisole anthelmintic at 12 weeks of age.

The second death occurred a few days after subsequent anthelmintic treatment. Both had been treated with Vitamin D and E a few days prior to death.

Both cria were in poor body condition with bodyweights of 14.8 kg and 20 kg. Preferred weaning weight for a 6-month-old alpaca is at least 25kg and they are often heavier at greater than 35kg. These cria may have been weaned at less than optimal body weight.

There were no gross lesions to indicate the cause of death. The cria, which had not been wormed for 3 months, had 320 Trichostrongyle-type eggs and 140 *Nematodirus battus* eggs per g of faeces. The recently wormed cria had a negligible faecal worm egg count but did have microscopic small intestine lesions of moderate, multifocal, chronic, eosinophilic, lymphoplasmacytic enteritis, suggestive of a chronic parasitic insult.

In addition, this cria had alopecia, hyperkeratosis and scaling of skin in both axillae with live *Sarcoptes scabiei* mites detected (see Figure 3).

Figure 3: Six-month-old cria, skin lesions due to Sarcoptes scabiei

Neurological disease in a juvenile alpaca

The carcase of a young male alpaca that had died shortly after being found collapsed and exhibiting neurological signs was submitted.

The animal was part of a small herd that are vaccinated for clostridial disease and have access to an outdoor paddock, fed a mixture of hay and concentrates, and receive a monthly vitamin D supplement.

At postmortem, a significant number of trichostrongyle-type eggs were detected in the caecal contents, and findings of congested meninges, glucosuria and a fibrin clot in the pericardial sac were suspicious of pulpy kidney disease although this was not confirmed by laboratory tests.

Hypomagnesemia was ruled out by an aqueous humour level within normal limits.

The brain was submitted for histology and findings were consistent with a neuropathic viral infection. A subsequent Malignant Catarrhal Fever PCR was negative, and Astrovirus and Louping Ill virus are considered the main differentials.

Farmed deer

Tuberculosis

Samples were received from a culled deer from a deer park as there was suspicion of tuberculosis. Multiple abscesses were visible in the mesenteric lymph nodes, and these contained soft white purulent material (see Figure 4), which is often the presenting sign of tuberculosis in deer. Culture confirmed the presence of *Mycobacterium bovis*.

Figure 4: Abscessation of mesenteric lymph node in a deer which confirmed tuberculosis

Congenital heart defect in a sika deer

A 6-month-old sika deer was found dead in a group of 35 adult and 20 youngstock kept on 10 acres of parkland.

During a period of 12 to 18 months there were 5 deaths reported, which included 3 deer calves in poor condition and 2 hinds with a history of blindness before being euthanized. No new introductions or movement between paddocks was reported in the breeding group. The affected group did not receive any vaccine, treatment or wormer. They were fed on grass supplemented with ewe nuts, sugar beet pellets and hay since last October. The deer were also provided with mineral licks.

The cause of death in this deer was found to be an atrial septal defect with lesions indicative of congestive heart failure such as subcutaneous oedema, accumulation of fluid in body cavities (see Figure 5) and a swollen, misshapen congested liver (see Figure 6). This defect is likely to be congenital and would account for its small size and failure to thrive despite being fed well.

Pneumonic lesions were suspected on gross examination, but histopathology confirmed that to be collapsed atelectatic lung parenchyma as a likely agonal event.

The changes in hepatocytes indicated hepatic atrophy, which is a feature of congestive disease. Parasitology was done to assess whether a worm burden might be at the root of its poor condition but was not deemed significant.

The findings in this deer were deemed unlikely to be representative of the ill-thrift reported in the calf group nor of the blindness in the adult group. Further submissions were advised from those groups.

Figure 5: Collapsed atelectatic lung and accumulation of fluid in thoracic cavity

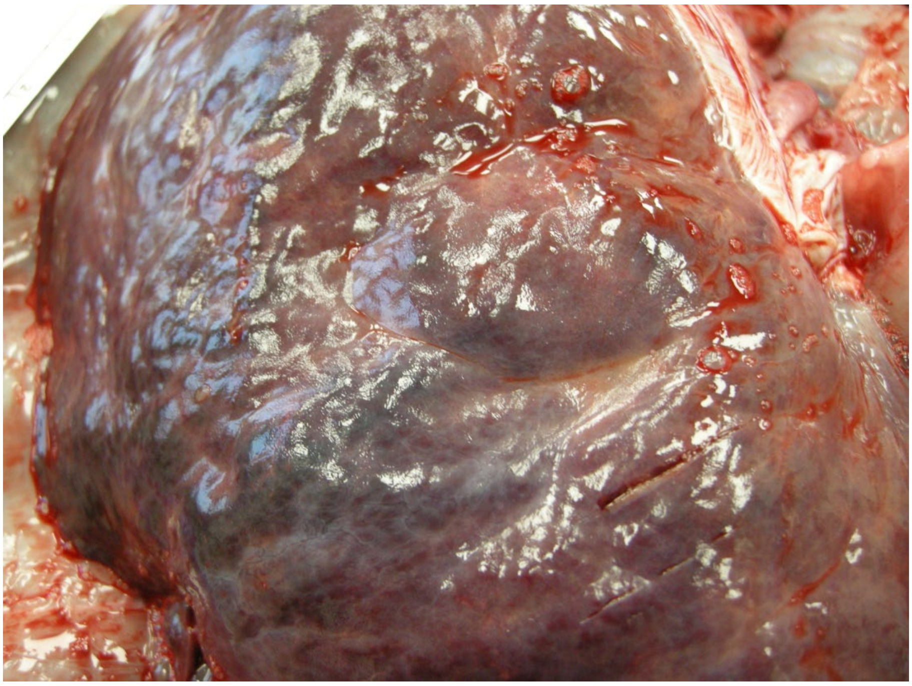

Figure 6: Swollen and misshapen congested liver

Horizon scanning

COVID-19 – survey in deer (Germany, Austria)

Serological Evidence that SARS-CoV-2 has not emerged in deer in Germany or Austria during the COVID-19 Pandemic.

Spillover of severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2) to North American white-tailed deer (Odocoileus virginianus) has been documented. However, it is unclear if this is a phenomenon specific to North American deer or is a broader problem.

We evaluated pre and pandemic exposure of German and Austrian deer species using a SARS-CoV-2 pseudoneutralisation assay. In stark contrast to North American white-tailed deer, we found no evidence of SARS-CoV-2 exposure.

Q fever – camels

Pre-print: A cross-sectional study of Q fever in camels: risk factors for infection, the role of small ruminants and public health implications for desert-dwelling pastoral communities.

Q fever represents an important neglected zoonosis, with high prevalences recorded across the Middle East region. Among rural desert-dwelling communities in the region, camel milk is largely consumed raw, due to perceptions of dromedaries as a uniquely clean livestock species mentioned in the Quran and Islamic hadith, while milk from other livestock species is usually boiled.

As a result, camels present a unique public health threat among such communities from milk-borne pathogens, including C. burnetii.

In view of this, an epidemiological survey was conducted among dromedary herds in southern Jordan between September 2017 and October 2018, including 404 camels from 121 randomly selected herds.

In addition, 510 household members associated with these herds were interviewed regarding potential high-risk practices for zoonotic transmission. Weight adjusted camel population seroprevalence for C. burnetii was 49.6% (95% CI: 44.7 to 54.5), with evidence of maternally derived immunity in calves less than 6 months old.

Adjusted herd-level prevalence was 76.0% (95%CI 72.7 to 80.2), with 30.4% (144/477) of individuals estimated to consume raw milk from infected herds monthly or more.

Following multivariable logistic regression analysis, seropositive status in camels was found to be associated with increasing age, high herd tick burdens, keeping the herd together throughout the year including when calving, and owning larger (greater than 50) sheep and goat flocks, with goats presenting a higher risk than sheep. Racing camel status was found to be protective.

Sociocultural appropriate interventions aimed at raising awareness of potential risks associated with drinking raw camel milk, alongside appropriate livestock management interventions, should be considered.

Publications

Clarke LL, Breuer RM. Postmortem diagnoses in South American camelids and factors influencing diagnostic rate in the Upper Midwest USA, 2009 to 2019. Journal of Veterinary Diagnostic Investigation. April 2022. doi:10.1177/10406387221091733

References

1. Dental disease in alpacas. Part 1: Prevalence of dental disorders and their mutual relationships. Proost et al (2020) https://doi.org/10.1111/jvim.15741
2. Dental disease in alpacas. Part 2: Risk factors associated with diastemata, periodontitis, occlusal pulp exposure, wear abnormalities and malpositioned teeth. Proost *et al* (2020) https://doi.org/10.1111/jvim.15740

This publication is available at:

https://www.gov.uk/government/collections/animal-disease-surveillance-reports

Any enquiries regarding this publication should be sent to us at SIU@apha.gov.uk

http://apha.defra.gov.uk/vet-gateway/surveillance/index.htm

The Animal and Plant Health Agency (APHA) is an executive agency of the Department for Environment, Food & Rural Affairs, and also works on behalf of the Scottish Government and Welsh Government.