Animal & Plant Health Agency

SRUC

Great Britain miscellaneous and exotic farmed species quarterly report

Disease surveillance and emerging threats

Volume 36: Quarter 2 of 2023 (April to June)

Highlights

- Liver fluke in an adult alpaca
- Endoparasitism in alpacas
- Tentative diagnosis of multisystemic axonal degeneration in an alpaca
- *Babesia capreoli* in Roe deer

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Introduction and overview

This quarterly report reviews disease trends and disease threats for the second Quarter of 2023 (April to June).

It contains analyses carried out on disease data gathered from the Animal and Plant Health Agency (APHA), Veterinary Services division of Scotland's Rural College (SRUC) and partner postmortem 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 on the APHA species disease surveillance reports: data analyses page on GOV.UK.

Issues and trends

Nothing to report this quarter.

Diagnostic Submission Data

The number of diagnostic submissions in Quarter 2 of 2023 (April to June) for alpacas, llamas and farmed deer is shown in 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 (April to June) for period 2019 to 2023 are shown in Figure 1. Total numbers rising from 2020 for Q2 with higher number of submissions (carcase and non-carcase) occurring in 2023. To highlight the contributions for this increase of carcase submissions to APHA and non-carcase submissions to SAC.

Table 1 - Diagnostic submissions in Quarter 2 of 2023 (April to June) for alpacas, llamas, and farmed deer to APHA and Scottish Agricultural College (SAC)

April - June	Non-carcase submissions APHA	Non-carcase submissions SAC	Total non-carcase submissions	Carcase submissions APHA	Carcase submissions SAC	Total carcase submissions	Grand total
2019	8	6	14	27	8	35	49
2020	14	2	16	13	2	15	31
2021	18	21	39	22	4	26	65
2022	21	27	48	20	3	23	71
2023	14	34	48	36	3	39	87

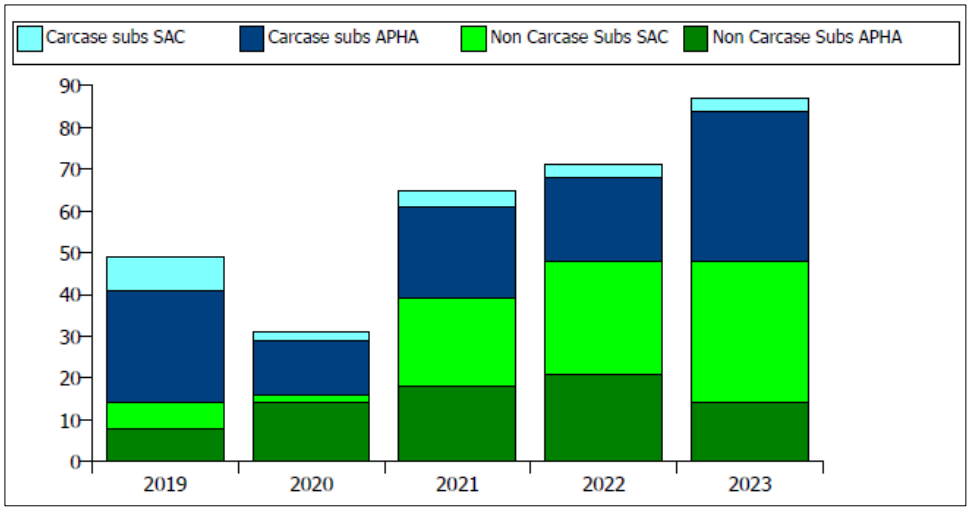

Figure 1 - Carcase and non-carcase submissions for Quarter 2 of 2023 (April to June) Period 2019 to 2023

Total diagnostic submissions for Quarter 2 for all years (2019 to 2023) for each main species covered by this report and for each main geographical area are shown in Table 2.

Table 2 - Total diagnostic submissions for Quarter 2 for all years (2019 to 2023) in the different geographical areas

All Years	Alpaca	Deer	Llama	Sum
Eastern England	50	15	2	**67**
Northern England	44	7	5	**56**
Scotland	48	22	3	**73**
Wales	13	2	2	**17**
Western England	53	13	2	**68**
Unknown	17		5	**22**
Summary	**225**	**59**	**19**	**303**

New and re-emerging diseases and threats

Nothing to report this Quarter.

Diagnoses from the Great Britain scanning surveillance network including unusual diagnoses

Camelids

Liver fluke in an adult alpaca

Severe liver fluke was the cause of death of a ten-year old alpaca which unexpectedly deteriorated to recumbency and death within the course of one hour. The group of three alpacas and eight llamas were outside at pasture with access to field shelters. They received additional haylage and camelid mix. Following detection of internal parasites at the beginning of 2022, the animals had received anthelmintic treatment, but it was unlikely they had been administered any other treatment after. On postmortem examination the carcass was dehydrated, and the liver was enlarged with multiple areas of fibrotic tissue and nodular formations throughout the parenchyma (Figure 2). The bile ducts were very engorged/ thickened and contained numerous adult liver flukes. The mucosa of the bile ducts was irregular in places. The lung lobes were uniformly reddened and oedematous (Figure 3) and E.coli was isolate in heavy pure growth from the lung tissue likely as a terminal bacteriaemia. The internal parasite egg burden was negligible. Treatment of the rest of the group was recommended to prevent further losses.

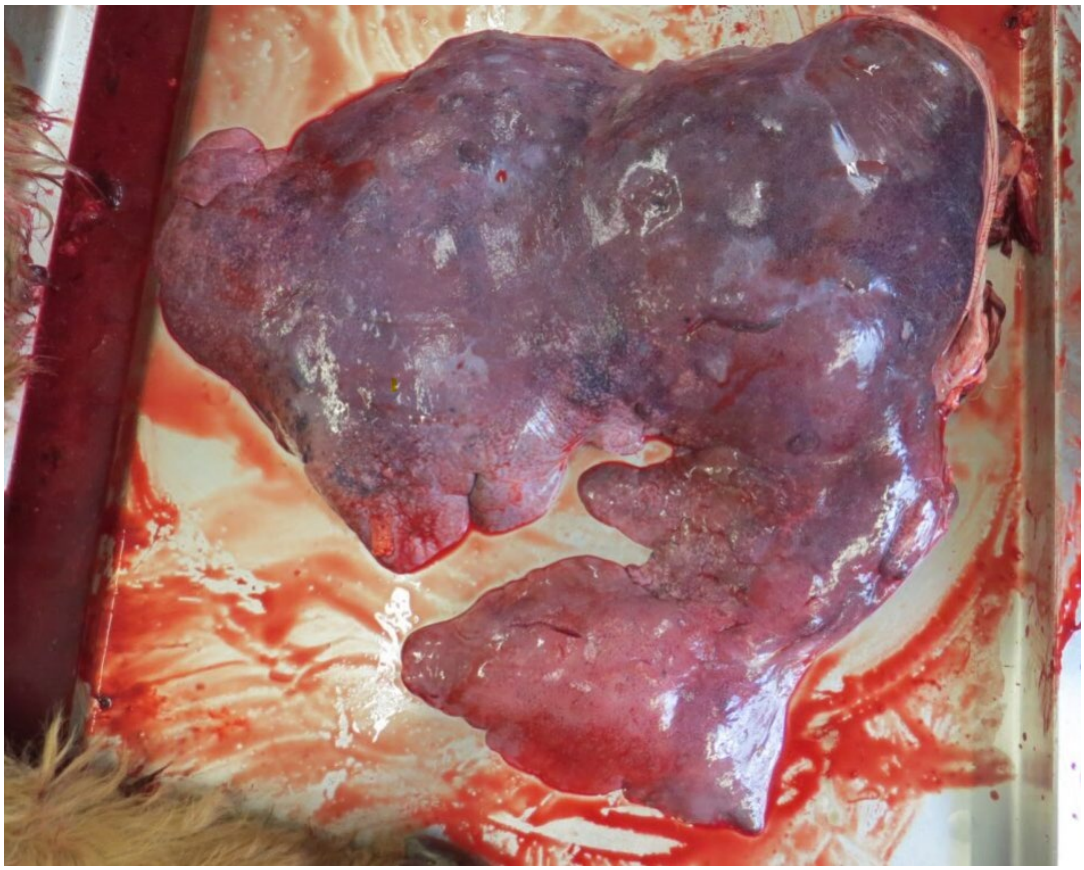

Figure 2 – enlarged alpaca liver, with multiple areas of fibrotic tissue and nodular formations throughout the parenchyma, due to liver fluke

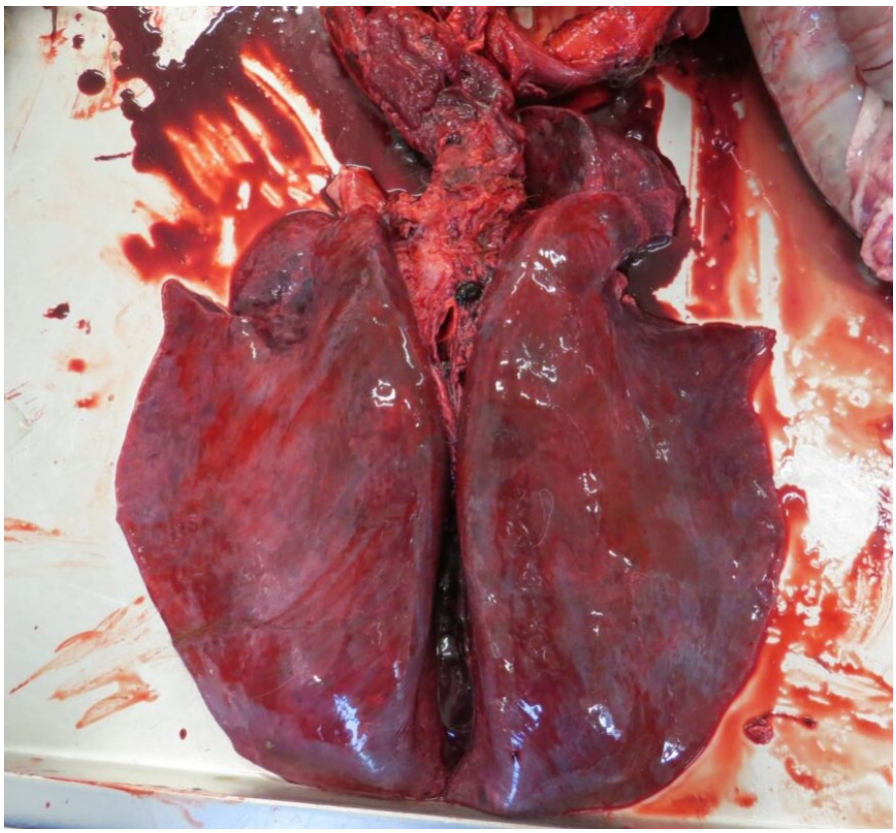

Figure 3 – alpaca lung lobes, uniformly reddened and oedematous, from which E coli was isolated in pure growth

Endoparasitism in alpacas

Two alpacas were received, on different dates, from one herd with a total of around 75 breeding females. One was a three-year old female that was emaciated, weighing 29 kgs. She had been treated with an Ivermectin-type product the previous week. Postmortem examination revealed an inflamed C3 which had a ‘knobbly’ raised thickened mucosa and watery large intestinal contents. A worm egg count revealed 550 worm eggs per gram in liquid faeces, and a total worm estimate of the C3 contents showed the presence of *Trichstrongylus axei, Teladorsagia/Ostertagia* spp and low numbers of *Haemonchus* spp. Histology confirmed the presence of a parasitic gastritis. The second alpaca was a large adult castrated male, weighing 68 kgs, and was in slightly better body condition. Gross postmortem findings were non-specific, and parasitology showed only a very modest worm burden. Histopathology showed a severe diffuse hepato-cellular vacuolar degeneration (lipidosis), the cause of which remains a mystery. Cobalt deficiency can cause similar microscopic lesions in sheep and goats but has not been documented in alpacas; the liver changes could have occurred secondary to gut damage associated with endoparasites. (Figure 4).

Figure 4 - thickened C3 mucosa, from an alpaca, due to endoparasitism.

Tentative diagnosis of multisystemic axonal degeneration in an alpaca

The carcase of a nine-month-old, castrated alpaca was submitted, having been euthanased following a long history of initially hindquarter paresis followed by recumbency. Gross postmortem examination was unremarkable but histopathological evaluation of the brain and spinal cord revealed multifocal and widespread degeneration of the white matter in the spinal cord, caudal brainstem and cerebellar peduncles. The pathology was described as chronic and ongoing, but it was difficult to determine whether this represented degeneration primarily of the axon or the myelin sheath, however, the abundance of axonal swellings suggested this might be a primary axonopathy. The changes are distributed across multiple functional areas and were most suggestive of a multisystemic axonal degeneration, previously described in cattle [(1)] and dogs but not in camelids, with a possible genetic basis.

Deer

Babesia capreoli in Roe deer

A selection of samples was submitted from a postmortem examination of an adult pregnant female Roe Deer with a history of collapse. Liver copper level was low at 271 micromol/kg DM (reference range 314-7850 micromol/kg DM) and a pan-piroplasm PCR

test of splenic tissue gave a positive result, matching 100% with *Babesia capreoli*. A separate second Roe Deer submission gave the same pan-piroplasm result but this time with liver copper levels within reference range but with evidence of severe parasitic gastroenteritis.

In Europe, three main Babesia spp. have been described in deer: *Babesia divergens/B. divergens-like*, *B. capreoli* and B. *venatorum* [2]. Despite usually deer infections are asymptomatic, fatal cases due to *B. capreoli* and *B. venatorum* [3] in captive reindeer have been reported.

Horizon scanning

APHA's new Endemic Disease Alert System

This is a new component of the communications from our scanning surveillance network and a new system that the APHA will be using to keep you up to date with significant disease alerts and information, projects, publication of reports and other items.

This is independent of the notifiable disease alert system.

To receive these notifications please email SIU@apha.gov.uk with your:

- email address
- mobile number if you wish to receive text alerts

We hope that you find this new messaging system useful, and we welcome any suggestions or feedback. Email Surveillance Intelligence Unit SIU@apha.gov.uk for more information.

Publications

Following a British Deer Veterinary Association (BDVA) CPD event on veterinary care of reindeer, the committee shared a comprehensive list of recent articles on the subject accessed via PubMed via the title or PMID reference and they are all free/open access.

Therapeutic measures

- Davidson RK, Fæste CK, Uhlig S, Tukun FL, Lian H, Solvang HA et al. Pharmacokinetics of a long-acting subcutaneous eprinomectin injection in semi-domesticated reindeer (*Rangifer tarandus tarandus*) - A pilot study. Environ Toxicol Pharmacol. 2023;97:104041. DOI: 10.1016/j.etap.2022.104041.

- Nurmi H, Laaksonen S, Raekallio M, Hänninen L. Wintertime pharmacokinetics of intravenously and orally administered meloxicam in semi-domesticated reindeer (*Rangifer tarandus tarandus*). Vet Anaesth Analg. 2022;49:423-428. DOI: 10.1016/j.vaa.2022.04.005.

Malignant Catarrhal Fever (MCF)

- Gong M, Myster F, van Campe W, Roels S, Mostin L, van den Berg T et al. Wildebeest-Derived Malignant Catarrhal Fever: A Bovine Peripheral T Cell Lymphoma Caused by Cross-Species Transmission of *Alcelaphine Gammaherpesvirus 1*. Viruses. 2023;15:526. DOI: 10.3390/v15020526

TSEs-CWD related.

- EFSA Panel on Biological Hazards (BIOHAZ); Koutsoumanis K, Allende A, Alvarez-Ordoñez A, Bolton D, Bover-Cid S, Chemaly M, et al. Monitoring of chronic wasting disease (CWD) (IV). EFSA J. 2023;21:e07936. DOI: 10.2903/j.efsa.2023.7936. PMID: 37077299.

- Tranulis MA, Tryland M. The Zoonotic Potential of Chronic Wasting Disease-A Review. Foods. 2023;12:824. DOI: 10.3390/foods12040824. PMID: 36832899.

- Tranulis MA, Gavier-Widén D, Våge J, Nöremark M, Korpenfelt SL, Hautaniemi M et al. Chronic wasting disease in Europe: new strains on the horizon. Acta Vet Scand. 2021;63:48. DOI: 10.1186/s13028-021-00606-x.

Disease surveys

- Luginbühl C, Gross J, Wenker C, Hoby S, Basso W, Zanolari P. Reindeer Husbandry in Switzerland-Management, Feeding and Endoparasite Infections. Animals (Basel). 2023;13:1444. DOI: 10.3390/ani13091444. PMID: 37174481.

- Tryland M, Sánchez Romano J, Nymo IH, Mørk T, Þórarinsdóttir R, Breines EM et al. A Screening for Virus Infections among Wild Eurasian Tundra Reindeer (*Rangifer tarandus tarandus*) in Iceland, 2017-2019. Viruses. 2023;15:317. DOI: 10.3390/v15020317. PMID: 36851530.

- Utaaker KS, Ytrehus B, Davey ML, Fossøy F, Davidson RK, Miller AL et al. Parasite Spillover from Domestic Sheep to Wild Reindeer-The Role of Salt Licks. Pathogens. 2023;12:186. DOI: 10.3390/pathogens12020186. PMID: 36839459.

- Tryland M, Cunha CW, Fuchs B, Breines EM, Li H, Jokelainen P et al. A serological screening for potential viral pathogens among semi-domesticated Eurasian tundra reindeer (*Rangifer tarandus tarandus*) in Finland. Acta Vet Scand. 2023;65:8. DOI: 10.1186/s13028-023-00671-4. PMID: 36814283.

Genetics

- Harding LE. Available names for *Rangifer* (Mammalia, Artiodactyla, Cervidae) species and subspecies. Zookeys. 2022;1119:117-151. DOI: 10.3897/zookeys.1119.80233. Erratum in: Zookeys. 2022;1122:173-174. PMID: 36762356.

Antlers

- Sinha S, Sparks HD, Labit E, Robbins HN, Gowing K, Jaffer A et al. Fibroblast inflammatory priming determines regenerative versus fibrotic skin repair in reindeer. Cell. 2022;185:4717-4736.e25. DOI: 10.1016/j.cell.2022.11.004. PMID: 36493752.

References

1. Syring, C., Drögemüller, C., Oevermann, A., Pfister, P., Henke, D., Müller, S., Sölkner, J., Leeb, T. and Meylan, M. (2010), Degenerative Axonopathy in a Tyrolean Grey Calf. Journal of Veterinary Internal Medicine, 24: 1519-1523. DOI: https://doi.org/10.1111/j.1939-1676.2010.0607.x
2. Fanelli A. A historical review of Babesia spp. associated with deer in Europe: *Babesia divergens/Babesia divergens*-like, *Babesia capreoli*, *Babesia venatorum*, *Babesia cf. odocoilei*. Vet Parasitol. 2021 Jun; 294:109433. DOI: https://doi.org/10.1016/j.vetpar.2021.109433
3. Marilisa Novacco, Regina Hofmann-Lehmann, Felix Grimm, Marina L. Meli, Martina Stirn, Fatal acute babesiosis associated with Babesia venatorum infection (Babesia sp. EU1) in a captive reindeer calf in Switzerland, Veterinary Parasitology: Regional Studies and Reports, Volume 18, 2019, 100336, ISSN 2405-9390. DOI: https://doi.org/10.1016/j.vprsr.2019.100336.

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