EQUINE DISEASE SURVEILLANCE

2024 Q3 QUARTERLY REPORT

Produced by:

EIDS
Equine Infectious Disease Surveillance

UNIVERSITY OF CAMBRIDGE
Department of Veterinary Medicine

EQUINE DISEASE SURVEILLANCE QUARTERLY REPORT

VOLUME: 20, No. 3
Jul - Sep 2024

INTRODUCTION

Welcome to the equine disease surveillance report for the third quarter of 2024, produced by Equine Infectious Disease Surveillance (EIDS), based in the Department of Veterinary Medicine at the University of Cambridge.

National disease data are collated through multiple diagnostic laboratories and veterinary practices throughout the United Kingdom, providing a more focused insight into the occurrence of equine infectious disease. Due to the global mixing of the equine population through international trade and travel, collaboration on infectious disease surveillance between countries occurs on a frequent basis to inform and alert. Both national and international information will be summarised within this report.

Any comments and feedback on the report are welcomed and we encourage contributions on focus articles. To view previous reports, see www.equinesurveillance.org and to receive reports free of charge, via email on a quarterly basis, please contact equinesurveillance@vet.cam.ac.uk.

HIGHLIGHTS IN THIS ISSUE

NEWS ARTICLES:

- The Equine Industries Committee - Who, what, and why?
- Strategies to monitor and combat parasite-related disease and anthelmintic resistance in horses

FOCUS ARTICLE:

- An ongoing concern: Twenty years of research on equine atypical myopathy with a focus on UK surveillance data

TABLE OF CONTENTS

NOTE:

The data presented in this report must be interpreted with caution, as there is likely to be some bias in the way that samples are submitted for laboratory testing. For example, they are influenced by factors such as owner attitude or financial constraints, or are being conducted for routine screening as well as clinical investigation purposes. Consequently, these data do not necessarily reflect true disease frequency within the equine population of UK.

WITH THANKS TO THE FOLLOWING SUPPPORTERS

Department for Environment Food & Rural Affairs

BEVA

Llywodraeth Cymru Welsh Government

Department of Agriculture, Environment and Rural Affairs

Scottish Government Riaghaltas na h-Alba gov.scot

NEWS ARTICLES

THE EQUINE INDUSTRIES COMMITTEE - WHO, WHAT, AND WHY?

The UK's Equine Industries Committee (EIC), which is chaired by Professor Sidney Ricketts and administered by Equine Infectious Disease Surveillance (EIDS), is a longstanding legacy from the Animal Health Trust. Meetings of the EIC continue to be held twice a year, usually in February and September, with the aim of sharing and discussing the latest information on matters relating to equine infectious diseases affecting the UK and Europe. Representatives from France, Germany, Ireland and Italy (as the main signatories to the Horserace Betting Levy Board (HBLB) International Codes of Practice), USA and elsewhere also attend.

The meetings, held online via Zoom, bring together nearly 80 representatives from 46 stakeholder associations and institutions, including universities, sporting organisations, pharmaceutical companies, breed groups, veterinary associations and other key sectors of the European equine industry. EIC meetings keep all sectors of the equine industry informed about current and future disease risks, the latest disease outbreaks, developments in research and availability of diagnostics, treatments and vaccines and relevant regulatory updates. Attendees are encouraged to share their expertise and insights on these topics and where appropriate specialist contributors may be invited to meetings to contribute to specific topics of concern.

The latest EIC meeting was held on Wednesday 25 September 2024 and the agenda for this meeting was typical and included:

- An update from EIDS on the International Collating Centre (ICC) and its other surveillance initiatives
- Findings from equine influenza surveillance and associated research findings
- The latest on equine herpes virus and rotavirus B vaccine research
- Summaries of the surveillance of equine infectious diseases in France, Germany, Ireland, and Italy
- Updates on topics of relevance from several equestrian bodies, including British Equestrian, FEI and the BHA
- Discussion around the potential impact of the proposed EU Animal Welfare in Transport Legislation, particularly on the European Thoroughbred breeding industry.

In summary, the biannual EIC meetings provide an essential platform for equine industry stakeholders and veterinary advisors to exchange insights and collaborate on maintaining the health and safety of horses and equine sports.

NEWS ARTICLES

STRATEGIES TO MONITOR AND COMBAT PARASITE-RELATED DISEASE AND ANTHELMINTIC RESISTANCE IN HORSES

As anthelmintic resistance among equine parasites continues to rise globally, monitoring and managing this issue has become critical to safeguarding equine health with development of sustainable strategies for the prevention of parasite-related disease. This article looks to provide an update on recently released initiatives.

BEVA PROTECTMETOO ANTHELMINTIC TOOLKIT

The protectMEtoo toolkit is there to help vets and practices to develop parasite control initiatives that incorporate anthelmintic use as part of an integrated programme for better, more responsible use of dewormers.

The protectMEtoo toolkit has been developed to promote the responsible use of dewormers in equine populations, focusing on preventative principles to reduce parasite transmission rather than the treatment of clinical cases. It is designed specifically for use in mature horses, providing veterinary professionals and practices with resources to develop effective control practices and judicious use of anthelmintic. Specific guidance for foals and other youngstock and also donkeys and hybrids is also available. Before using the toolkit, it is recommended to review the 'Protecting Anthelmintics Fact Sheet' which summarises current challenges, dispels outdated advice and addresses common myths surrounding parasite control. BEVA is also developing additional educational resources for vets, such as online meetings discussing parasite-associated clinical disease cases, particularly when resistance is encountered.

www.beva.org.uk/Resources/Medicines/Anthelmintic-Toolkit

CANTER GUIDELINES

In early October 2024 the cross-sector group CANTER (Controlling ANTiparasitic resistance in Equines Responsibly) released its first set of guidelines to support veterinary professionals, pharmacists and Suitably Qualified Persons (SQPs) in the UK. These guidelines aim to promote sustainable worm control practices and emphasise the importance of reducing reliance exclusively on anthelmintics as a means of parasite control and avoiding routine treatments that promote the development of drug-resistant worms.

The CANTER Guidelines:
www.canterforhorses.org.uk/guidelines

The CANTER Guidelines outline three key approaches for more targeted parasite control:

- Implementing horse and pasture management strategies to minimise environmental contamination by parasites and disrupt parasite transmission cycles.
- Monitoring worm burdens by using faecal worm egg counts (FWECs) to identify horses shedding higher levels of eggs, using FWEC to determine the need for treatment and carrying out FWEC reduction tests to monitor for anthelmintic resistance.
- Applying a risk-based approach, guided by diagnostic testing, to estimate potential exposure of individual horses to parasite transmission.

The CANTER group is now focusing on developing resources for horse owners.

SURVEILLANCE OF EQUINE ENDOPARASITES AND ASSOCIATED DISEASES

The Equine Infectious Disease Surveillance (EIDS) team has been working to enhance the understanding of equine parasite prevalence in the UK. EIDS has been engaged in passive surveillance for over 20 years through the Equine Quarterly Disease Surveillance Report (EQDSR). This involves collecting data from UK-based diagnostic laboratories on FWECs including the number of tests performed and the proportion of positive results.

EIDS has recently undertaken a detailed analysis of these data, focusing on diagnostic thresholds used by different laboratories to report FWEC results as positive, as well as the methodologies employed in testing. This ongoing research will offer invaluable insights into trends in parasite infections and guide the continuous advancements in surveillance data collection. The findings are expected to be published soon.

To address specific concerns raised by the equine industry regarding the potential unintended consequences of reducing anthelmintic use on changing patterns of parasite-associated clinical disease, EIDS has developed a targeted surveillance initiative, called RedWatch, to gather case report data on small and large red worm (cyathostominosis and *Strongylus vulgaris*) disease occurrences.

Equine Infectious Disease Surveillance

RedWatch

NEWS ARTICLES

This initiative includes the launch of an online form that encourages veterinary practitioners to submit data on clinical cases of red worm-associated disease, including large as well as small strongyles. The former, often detected during post-mortem examinations, is expected to be mainly captured through the EQDSR's post-mortem surveillance section but RedWatch will allow veterinary surgeons to also report cases. Case data collected includes: attending vet details, case details, diagnostic methods, clinical signs, premises population data and potential risk factors.

By fostering greater data collection and sharing, this project aims to fill critical knowledge gaps about the impact of reduced anthelmintic use, enabling the equine community to make more informed decisions regarding parasite control. Over time, it is hoped that case reports can be shared in near-real time on an anonymous basis, supporting education and awareness raising. All data are handled and stored in password protected databases, providing assurances of data security. Data will also support ongoing research into disease risk and any data shared in the public domain will be anonymised. This could include the evaluation of spatial and temporal trends and potentially, the influence of weather patterns—information that could eventually inform the development of a warning system for times and places of increased risk, such as is adopted for *Nematodirus spp* infection in sheep through the Sustainable Control of Parasites in Sheep (SCOPS) initiative (https://www.scops.org.uk/).

REPORT A CLINICAL CASE OF REDWORM

www.equinesurveillance.org/redwatch

AN ONGOING CONCERN: TWENTY YEARS OF RESEARCH ON EQUINE ATYPICAL MYOPATHY WITH A FOCUS ON UK SURVEILLANCE DATA

Anne-Christine François, Benoît Renaud, Caroline-Julia Kruse, Christel Marcillaud-Pitel and Dominique-Marie Votion

University of Liège, Faculty of Veterinary Medicine & Réseau d'Epidémio-Surveillance en Pathologie Équine (RESPE)

The Atypical Myopathy Alert Group (AMAG) was established in 2004 to monitor and alert on atypical myopathy outbreaks. Here the group discuss the latest research, insights from 20 years of surveillance data and emphasise the importance of veterinary contributions to expand knowledge and enhance prevention efforts.

Introduction

Equine atypical myopathy (AM) is a severe form of toxic plant poisoning that affects equids at pasture, with a high mortality rate, reported at 74% by (1). AM occurs following the ingestion of protoxins present in seedlings (2) and fruits (3,4) of *Acer* species trees, primarily *Acer pseudoplatanus* in temperate European regions (5) (Figure 1) and *Acer negundo* in North America (6). In Europe, AM outbreaks are observed mainly in spring (March to May) and autumn (October to December), predominantly affecting horses that spend more than six hours per day at pasture (7).

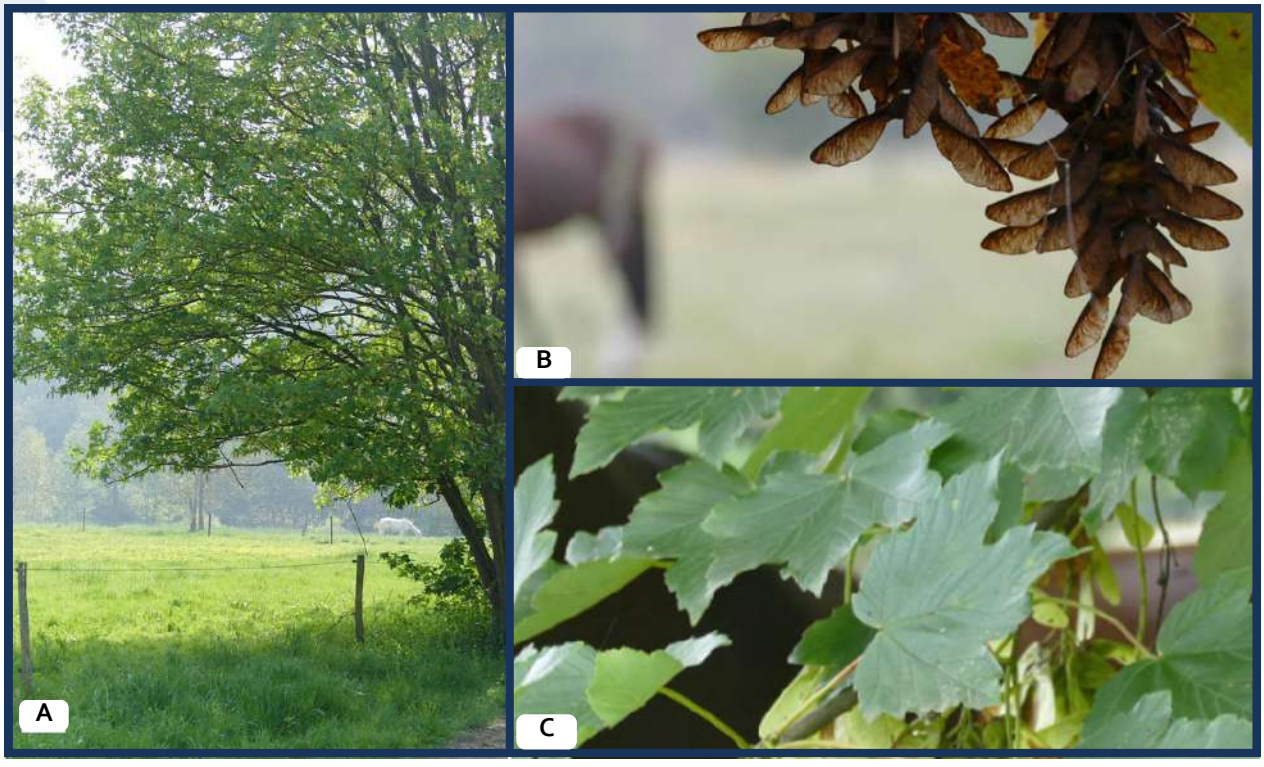


Figure 1: a. *Acer pseudoplatanus*, b. fruits of *A. pseudoplatanus*, c. leaves of *A. pseudoplatanus*

CLINICAL SIGNS AND DIAGNOSIS OF EQUINE ATYPICAL MYOPATHY

CLINICAL SIGNS INCLUDE:

- Depression
- Weakness
- Stiffness
- Lateral recumbency
- Trembling
- Sweating

PRESUMPTIVE DIAGNOSIS OF ATYPICAL MYOPATHY:

A multifactorial approach is required, combining the following elements:

1. **Recent history:**
    - Time spent at pasture, season (autumn/spring in the UK)
2. **Environmental factors:**
    - Presence of toxic trees in the pasture
3. **Physical examination**:
    - Confirmation of typical clinical signs
4. **Evidence of acute myopathic syndrome:**
    - Indicated by pigmenturia and/or significantly elevated serum creatine kinase levels

Clinical signs in poisoned horses include depression, weakness, stiffness, lateral recumbency, trembling, and sweating (1,8) and reflect the severe rhabdomyolysis syndrome that affects postural, respiratory, and cardiac muscles, accompanied by pigmenturia (9). The incriminated protoxins are methylenecyclopropylalanine, known as hypoglycin A (HGA) and methylenecyclopropylglycine (MCPrG), which themselves are not toxic (5,6,10). However, two-step metabolisation gives rise to two toxic compounds (methylenecyclopropylacetyl-CoA (MCPA-CoA) for HGA and methylenecyclopropylformyl-CoA (MCPF-CoA) for MCPrG; (11), which disrupt the b-oxidation of fatty acids, predominantly in skeletal muscles (12).

A presumptive diagnosis of AM is multifactorial and relies on combining elements of (1) recent history such as time spent at pasture and season, (2) the environment, such as presence of toxic trees around the pasture, (3) physical examination confirming typical clinical signs, and (4) evidence of an acute myopathic syndrome suggested by pigmenturia and/ or confirmed by severe elevated serum creatine kinase levels (1,7,8,13–15).

In 2004, the Atypical Myopathy Alert Group (AMAG) was established in Belgium to alert practitioners and horse owners when there were AM outbreaks. The network expanded to Europe in 2006 with close collaboration with the Réseau d'Épidémio-Surveillance en Pathologie Équine (RESPE) network, which tracks French cases. The cause of AM was discovered just over ten years ago (5,6), and since then several laboratories have provided analyses of protoxins and toxic metabolites. The presence of protoxins in blood confirms exposure to poisonous trees, while the presence of toxic metabolites (MCPA and/ or MCPF-conjugates), in association with a severely altered acylcarnitines profile, provides a definitive diagnosis (16). Although acylcarnitine profiling is increasingly available in diagnostic laboratories, it is not routinely performed. As a result, AM diagnosis is typically based on presumptive findings.

This article provides a timely overview of declared presumptive cases to AMAG during the last 18 years, with a focus on the situation in the United Kingdom (UK).

Collecting data from European AM cases

Information about European AM cases over an 18-year period (2006–2023) was collected via standardised questionnaires available on the AMAG (http://www.myopathie-atypique.be) and RESPE (https://respe.net) websites. These were completed via email or telephone contact with owners (for management and environment information) and/or veterinarians (for clinical data) whenever feasible. Cases were classified as 'autumnal' cases when occurring in the six months between the beginning of September and the end of February, whereas 'spring' cases occurred between the beginning of March and the end of August (7).

From 2006 to December 2023, a total of 3,199 European AM cases have been recorded by AMAG in association with RESPE. The five countries reporting the highest total number of cases are France (n=1310), Belgium (n=782), the UK (n=412), Germany (n=314), and the Netherlands (n=111), with Hungary reporting its first case to AMAG in autumn 2022 (Figures 2 and 3).

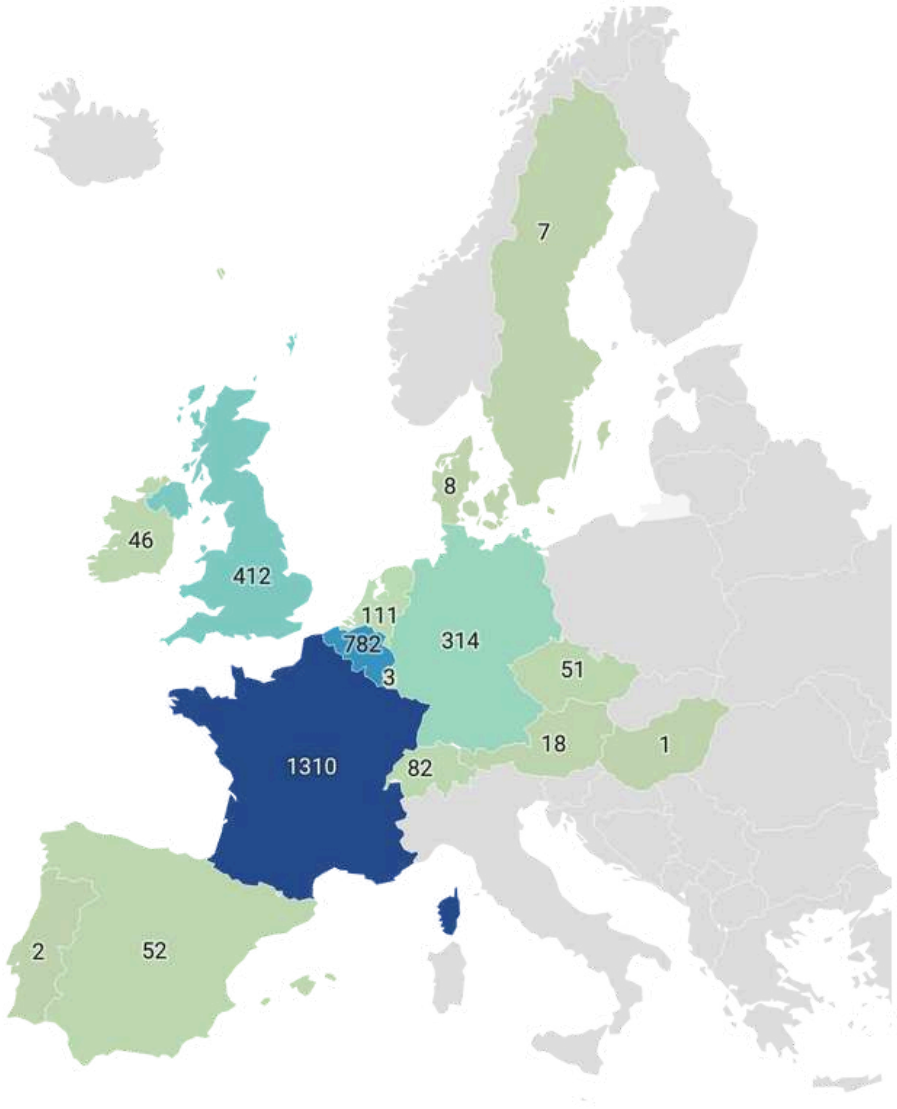


Figure 2: European distribution of atypical myopathy cases notified to the disease surveillance networks from autumn 2006 to December 2023.

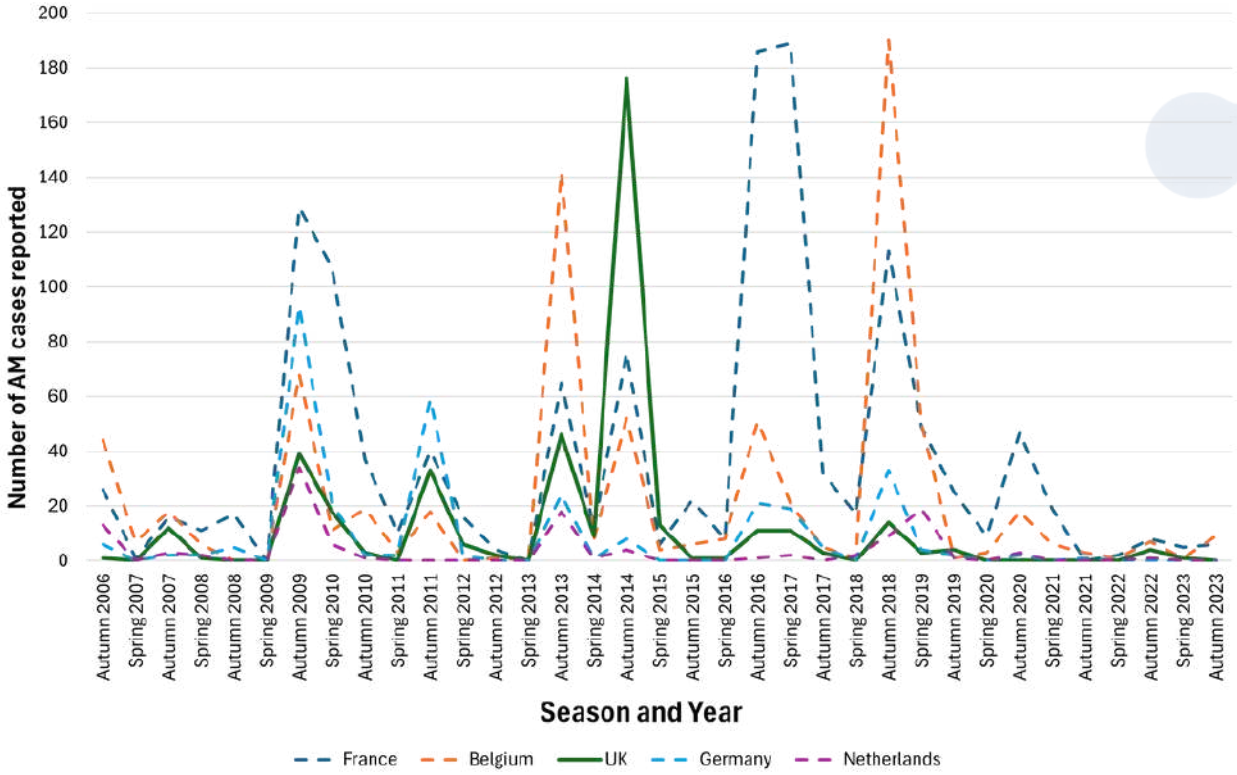


Figure 3: Time course (season and year) of numbers of atypical myopathy cases reported to AMAG since autumn 2006 by each of the top five reporting countries (France, Belgium, UK, Germany and the Netherlands)

The number of cases reported per year fluctuates a great deal, probably due to multiple factors that vary each year. Among them, the invasive character of the incriminated Acer species of trees and the quantity of fruits produced by these species, which can vary annually along with protoxin production levels. Weather conditions may affect the production and dispersal of toxic fruits, as well as pasture quality, both of which are key factors influencing exposure, particularly during years of intense fruiting. The abundance of these fruits and horses' access to contaminated pastures are key factors, with the latter being subject to modulation by climatic conditions.

Increased awareness and reporting practices also contribute to fluctuations in case numbers not only across years but also between countries. Indeed, the voluntary nature of reporting by owners, animal handlers and vets may influence the feedback obtained by AMAG.
In some countries, like France, a network of sentinel veterinarians routinely reports several diseases, including pasture-associated conditions, making their case reporting probably more consistent. Finally, the fact that the online questionnaires for reporting suspected AM cases are not translated into all European languages may present a barrier to spontaneous and regular reporting.

Focussing on AM occurring in the United Kingdom

Historically, the first reports of European AM outbreaks in the veterinary literature occurred during the 1980s in the UK from England and Scotland (17,18). The shift from anecdotal to recurrent reports of the condition underlines the emerging nature of AM and reflects a possible increase in awareness in recent years. However, compared with the last published inventory (7), only five cases have been added to the UK AM case count (four in autumn 2022 and one in spring 2023), despite a corresponding rise in case numbers across other European countries (Figure 3). This may suggest that since the end of 2019 cases of AM have been under-reported from the UK.

Figure 4: Distribution of 197 atypical myopathy cases across the United Kingdom between 2006-2023, mapped at the town level (n=155)

A total of 412 presumed cases of AM have been reported to AMAG from the UK since 2006. Of these reports, 261 locations were given, either as the address of the owner or of the pasture, and 197 reports indicated the specific location of the pasture where the suspected AM case was grazing and represented a total of 155 different UK towns, mainly in the lower half of England (Figure 4).

The epidemiology of AM in Europe

Epidemiological surveillance over the years has led to the collection of substantial information about AM cases in Europe (4,8,19–24). Thanks to these data, epidemiological analyses of European cases have enabled characteristics of the disease to be highlighted, such as high-risk seasons (8), mortality rate (13),most frequent clinical signs (1), and the environmental features, such as the link with weather conditions and with the presence of *A. pseudoplatanus* in pastures (8). Preventive measures, such as avoiding permanent grazing (15), as well as and risk and prognostic factors (14) have also been identified. A clinically relevant diagnostic algorithm, used to categorise cases reported to AMAG, and the ability for practitioners to refer to this algorithm (1) have helped in the recognition of the condition. This and other information has ultimately contributed to the discovery of the cause of AM and analysing AM cases registered by AMAG between 2006 and 2019 enabled researchers to address the most frequently asked questions regarding horse feeding and management practices to reduce the risk of AM (7).

However, the story is not over, and the threat of AM persists and may even be increasing due to the phenomena of climate change and the invasive nature of *A. pseudoplatanus*. The reduction of case reporting in the UK since 2019 prevents the identification of any potential specificities and hinders the ability to maintain vigilance during high-risk periods, which relies on up-to-date surveillance. The latest information from case reports and targeted field studies has revealed that this toxin poisoning can affect other herbivore species (25–27) , where the existence of subclinical cases has been suggested (27). To this end *A. pseudoplatanus* poisoning has also been demonstrated in Père David's deer (25), camels (26), and gnus (27) and concerningly the protoxins can pass into cow's milk, a foodstuff of animal origin that may be consumed by humans (28–30). Transfer of these toxins to milk has also been confirmed in mares, with or without clinical disease and thereby posing a risk during suckling to foals (31,32). A recent publication refines the diagnostic and prognostic criteria for AM, but more worryingly, it clearly demonstrates the existence of subclinical cases among co-grazers in equids (16,27)

Concluding remarks

The collection of data from AM cases remains essential to advancing research into the exact mechanisms of this intoxication and the quest for the discovery of a treatment that directly counteracts the action of the toxic molecules. Until now, treatment has only been symptomatic rather than targeted and aetiological and the mortality rate remains high in horses at 74% (1) and slightly lower at 56% among hospitalised horses (24). Using various samples collected by AMAG, new, alternative and ethically acceptable research methods are being developed, avoiding wherever possible the need for using animals in research (33).

With this brief article, we hope to raise awareness among horse owners and veterinary surgeons about the continued seasonal danger from the toxic plant insult of atypical myopathy or AM. We encourage both groups to report AM cases to the AMAG network to help to establish a responsive alert system. Reporting previous cases prior to Autumn 2024 also offers the benefit of gaining a better understanding of the European situation over time. The system allows for retrospective reporting, which we also strongly encourage.

REPORTING CASES OF ATYPICAL MYOPATHY

To report a case of atypical myopathy go to http://atypicalmyopathy.uliege.be/ and select between owner and veterinary reporting.

Faculté de Médecine vétérinaire
Myopathie atypique des équidés

REFERENCES

(1) Van Galen G, *et al*. European outbreaks of atypical myopathy in grazing equids (2006-2009): Spatiotemporal distribution, history and clinical features. Equine Vet J. 2012 Sep;44(5):614–20.

(2) Baise E, *et al*. Samaras and seedlings of *A. pseudoplatanus* are potential sources of hypoglycin A intoxication in atypical myopathy without necessarily inducing clinical signs. Equine Vet J. 2016 Jul 1;48(4):414–7.

(3) Unger L, *et al*. Hypoglycin A Concentrations in Seeds of *A. Pseudoplatanus* Trees Growing on Atypical Myopathy-Affected and Control Pastures. J Vet Intern Med. 2014;28(4):1289–93.

(4) Westermann CM, *et al.* Hypoglycin A Concentrations in Maple Tree Species in the Netherlands and the Occurrence of Atypical Myopathy in Horses. J Vet Intern Med. 2016 May 1;30(3):880–4.

(5) Votion DM, *et al.* Identification of methylenecyclopropyl acetic acid in serum of European horses with atypical myopathy. Equine Vet J. 2014 Mar;46(2):146–9.

(6) Valberg SJ, *et al.* Seasonal pasture myopathy/atypical myopathy in North America associated with ingestion of hypoglycin A within seeds of the box elder tree. Equine Vet J. 2013 Jul;45(4):419–26.

(7) Votion DM, *et al.* Answers to the frequently asked questions regarding horse feeding and management practices to reduce the risk of atypical myopathy. Animals. 2020 Feb 1;10(2).

(8) Votion D, *et al.* History and Clinical Features of Atypical Myopathy in Horses in Belgium (2000-2005). J Vet Interm MEd. 2007;21:1380–91.

(9) Cassart D, *et al.* Morphological alterations in oxidative muscles and mitochondrial structure associated with equine atypical myopathy. Equine Vet J. 2007 Jan;39(1):26–32.

(10) Bochnia M, *et al.* Detection of MCPG metabolites in horses with atypical myopathy. PLoS One. 2019 Feb 1;14(2).

(11) Melde K, *et al*. Metabolic consequences of methylenecyclopropylglycine poisoning in rats. Biochem J. 1991;274:395–400.

(12) Sander J, *et al.* Tissue Specific Distribution and Activation of Sapindaceae Toxins in Horses Suffering from Atypical Myopathy. Animals. 2023 Aug 1;13(15).

(13) van Galen G, *et al.* European outbreak of atypical myopathy in the autumn 2009. Journal of Veterinary Emergency and Critical Care. 2010;20(5):528–32.

(14) Van Galen G, *et al.* European outbreaks of atypical myopathy in grazing horses (2006-2009): Determination of indicators for risk and prognostic factors. Equine Vet J. 2012 Sep;44(5):621–5.

(15) Votion DM, *et al.* Atypical myopathy in grazing horses: A first exploratory data analysis. Veterinary Journal. 2009 Apr;180(1):77–87.

(16) Renaud B, *et al.* Large-Scale Study of Blood Markers in Equine Atypical Myopathy Reveals Subclinical Poisoning and Advances in Diagnostic and Prognostic Criteria. Environ Toxicol Pharmacol. 2024 Jul;104515.

(17) Hosie BD, *et al*. Acute myopathy in horses at grass in east and south east Scotland. Vet Rec. 1986;119(18):444–9.

(18) Whitwell KE, *et al.* Atypical myoglobinuria: An acute myopathy in grazing horses. Equine Vet J. 1988;20(5):357–63.

(19) Rivero JLL, Palencia P. Atypical myopathy in two grazing horses in northern Spain. Vet Rec. 2007;1–4.

(20) van der Kolk JH, *et al*. Equine acquired multiple acyl-CoA dehydrogenase deficiency (MADD) in 14 horses associated with ingestion of Maple leaves (*A. pseudoplatanus*) covered with European tar spot (Rhytisma acerinum). Mol Genet Metab. 2010 Oct;101(2–3):289–91.

(21) Gröndahl G, *et al*. Detection of the Toxin Hypoglycin A in Pastured Horses and in the European Sycamore Maple Tree (*A. Pseudoplatanus*) During Two Outbreaks of Atypical Myopathy in Sweden. Equine Vet J. 2015 Sep;47:22–22.

(22) McKenzie RK, *et al.* Detection of hypoglycin A in the seeds of sycamore (*A.pseudoplatanus*) and box elder (*A. negundo*) in New Zealand; the toxin associated with cases of equine atypical myopathy. N Z Vet J. 2016 May 3;64(3):182–7.

(23) Høffer SE, *et al.* Atypical Myopathy in Denmark Confirmed With the aTRAQ Assay. J Equine Vet Sci. 2016 Dec 1;47:77–9.

(24) Dunkel B, *et al.* Atypical myopathy in the South-East of England: Clinicopathological data and outcome in hospitalised horses. Equine Vet Educ. 2020 Feb 1;32(2):90–5.

(25) Bunert C, *et al.* Atypical myopathy in Père David's deer (*Elaphurus davidianus*) associated with ingestion of hypoglycin A. J Anim Sci. 2018 Aug 1;96(8):3537–47.

(26) Hirz M, *et al*. Atypical myopathy in 2 Bactrian camels. Journal of Veterinary Diagnostic Investigation [Internet]. 2021 Sep 1;33(5):961–5.

(27) Renaud B *et al*. *A. pseudoplatanus*: A Potential Risk of Poisoning for Several Herbivore Species. Toxins (Basel). 2022 Aug 1;14(8).

(28) Bochnia M, *et al.* Hypoglycin A in Cow's Milk—A Pilot Study. Toxins (Basel) 2021 Jun 1;13(6).

(29) El-Khatib AH, *et al.* A sensitive LC-MS/MS method for the quantification of the plant toxins hypoglycin A and methylenecyclopropylglycine and their metabolites in cow's milk and urine and application to farm milk samples from Germany. Anal Bioanal Chem. 2023;415:1933–42.

(30) Engel AM, *et al.* Detection of Hypoglycin A and MCPrG Metabolites in the Milk and Urine of Pasture Dairy Cows after Intake of Sycamore Seedlings. Cite This: J Agric Food Chem. 2023

(31) Sander J, *et al.* Detection of maple toxins in mare's milk. J Vet Intern Med. 2021 Jan 1 ;35(1):606

(32) Renaud B, *et al.* Grazing mares on pasture with sycamore maples: A potential threat to suckling foals and food safety through milk contamination. Animals. 2021 Jan 1;11(1):1–7.

(33) Kruse CJ, *et al.* New Pathophysiological Insights from Serum Proteome Profiling in Equine Atypical Myopathy. ACS Omega. 2024 Feb 13;9(6):6505–26.

The views expressed in this focus article are those of the author and independent of the Equine Quarterly Disease Surveillance Report.

UK Infectious Disease Reports

This section summarises **laboratory confirmed infectious disease outbreaks reported in the United Kingdom** during the third quarter of 2024. Each reported outbreak may involve more than one animal. To view current outbreak reports, see www.equinesurveillance.org/iccview.

No reported outbreak(s) in a region does not necessarily mean the area is free from the disease. When a particular disease is reported as 'endemic', disease outbreaks are common and at an expected level.

NOTIFIABLE DISEASES

The APHA Veterinary Exotic Notifiable Disease Unit (VENDU) co-ordinates the investigation of suspected exotic notifiable disease in Great Britain on behalf of Defra, Welsh Government and Scottish Government. Further information about notifiable diseases is available on https://www.gov.uk/government/collections/notifiable-diseases-in-animals.

It should be noted that all information relating to equine notifiable disease investigations (including suspect cases that are subsequently negated) will appear in this section and are not broken down by system. APHA non-negative test results that are referred to below do not equate to confirmed positive cases and are therefore not included in quarterly laboratory results tables. Confirmed positive results are based on APHA investigations and follow confirmation on official samples. Non-notifiable diseases will appear in their relevant system section.

EQUINE VIRAL ARTERITIS

Non-negative serology results were reported from two stallions. Following APHA investigations one horse was negative on serology after official blood sampling was completed and disease was negated. The second case had two official semen samples collected, which were negative on PCR and the stallion was no longer suspected of being an EVA carrier.

WEST NILE VIRUS

There have been no 'test to exclude' (TTE) cases for WNV.

DOURINE

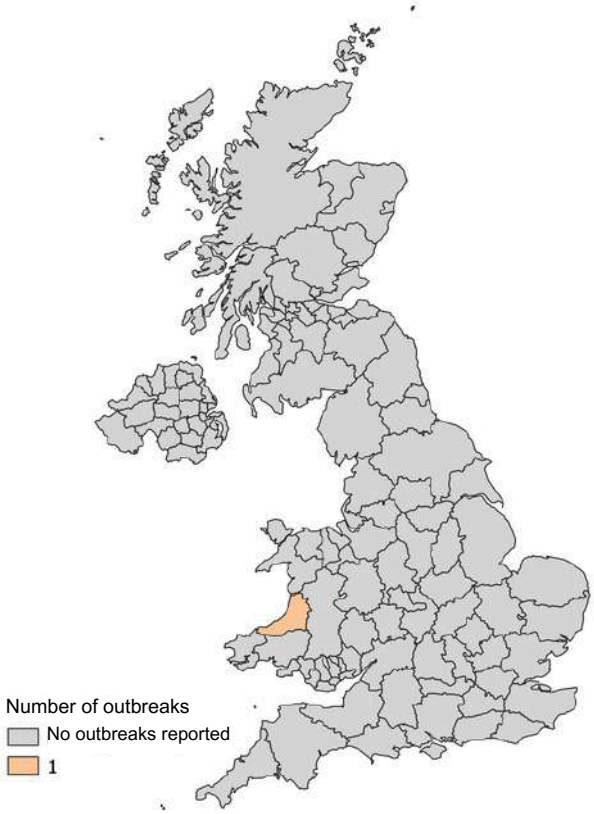
One non-negative serology (tested by IFAT) result was reported from a horse sampled during a routine pre-export test. Following an APHA investigation the official sample was negative, and suspicion of disease was ruled out.

Equine Herpes Virus

EHV-1 NEUROLOGICAL INFECTION

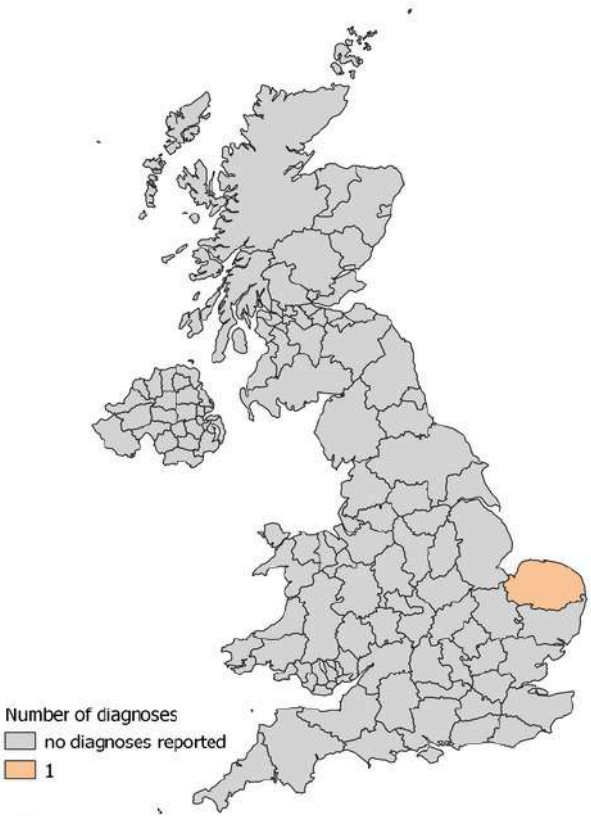
On 27 August 2024, Rossdales Laboratories reported a case of EHV-1 neurological disease on a premises in Wales. The affected case was a 13-year-old Warmblood mare presenting with a stiff gait and difficulty urinating, quickly progressing to ataxia and recumbency. The case was euthanased on humane grounds. Positive diagnosis was confirmed by PCR on a nasopharyngeal swab and blood.

There were three additional positive cases confirmed over the subsequent weeks, two of which displayed neurological signs. All three recovered and post-outbreak screening of the entire population confirmed that virus was no longer circulating.



Right: Frequency of reported laboratory outbreaks of EHV-1 neurological infection across the UK during 2024 Q3.

EHV-1 RESPIRATORY INFECTION



On 27 September 2024, Rossdales Laboratories reported a case of EHV-1 respiratory infection with a co-infection of *Streptococcus zooepidemicus* in an unvaccinated 38-year-old Welsh Section A mare on a premises in Norfolk.

Clinical signs, first noted on 26 September 2024, included mucopurulent nasal discharge. Positive diagnosis was confirmed on 27 September 2024, by PCR on a nasal swab. There were further eight direct in contacts.

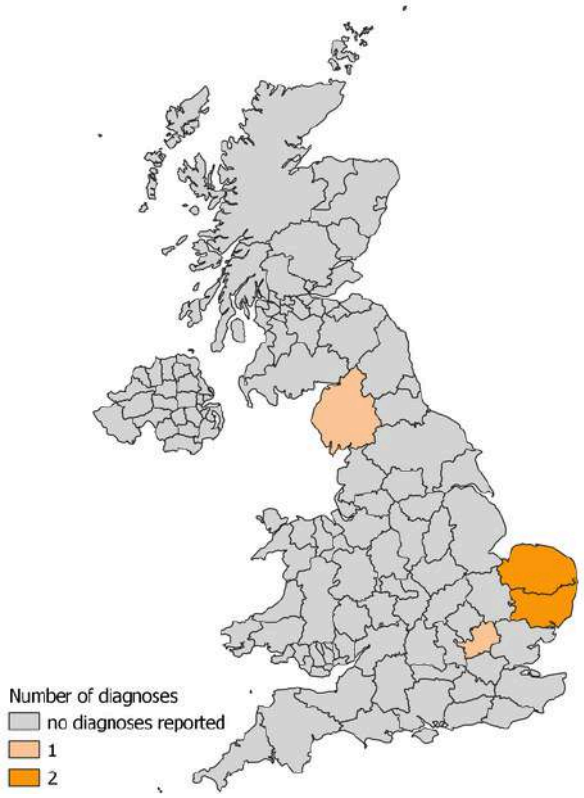
Left: Frequency of reported laboratory diagnoses of EHV-1 respiratory infection across the UK during 2024 Q3.

EHV-4 RESPIRATORY INFECTION

SUMMARY

In July 2024, Rossdales Laboratories reported one outbreak of Equine Herpes Virus-4 respiratory (EHV-4). In August 2024, Rainbow Equine Hospital reported one outbreak. In September 2024, Rossdales Laboratories reported two outbreaks and Three Counties Equine Hospital reported one outbreak.

Information regarding these five reported outbreaks is summarised in Table 1.



Frequency of reported laboratory diagnoses of EHV-4 respiratory infection across the UK during 2024 Q3.

Table 1: EHV-4 respiratory infection outbreaks reported 1 Jul to 30 Sep 2024.

Total outbreaks reported	5	
	n	%
Total horses sampled	6	100%
Sample type		
Swab	6	100%
Nasopharyngeal	3	50%
Nasal	3	50%
Signalment		
Sex of horse indicated	6	91%
Female	6	100%
Male	0	0%
Breed of horse	6	100%
Native UK pony	2	33%
Sports horse	3	50%
Crossbreed	1	17%
Age of horse	6	100%
Range	1 - 12 years	
IQR	2 - 12 years	
Median	6 years	
Clinical signs reported*	12	
Lethargy	2	17%
Nasal discharge	3	25%
Pyrexia	2	17%
Inappetence	3	25%
Lymphadenopathy	1	8%
Ocular discharge	1	8%
Vaccination status	6	100%
Unvaccinated	5	83%
Vaccinated	1	17%
Premises type	5	83%
Private	2	40%
Other	3	60%

**From 6 diagnoses*

Eighteen additional outbreaks of EHV-4 respiratory infection reported to EIDS, however, no epidemiological data could be obtained, due to either the submitting veterinary practice not providing the necessary data or a request for the information not to be circulated.

EHV-3 COITAL EXANTHEMA

Three unrelated cases on separate premises in two mares and a stallion reported by Rossdales Laboratories between 1 July and 30 September.

NB: *Figures in the UK Infectious Disease Report may differ, due to EIDS lacking permission to report some outbreaks or not receiving real-time epidemiological data*

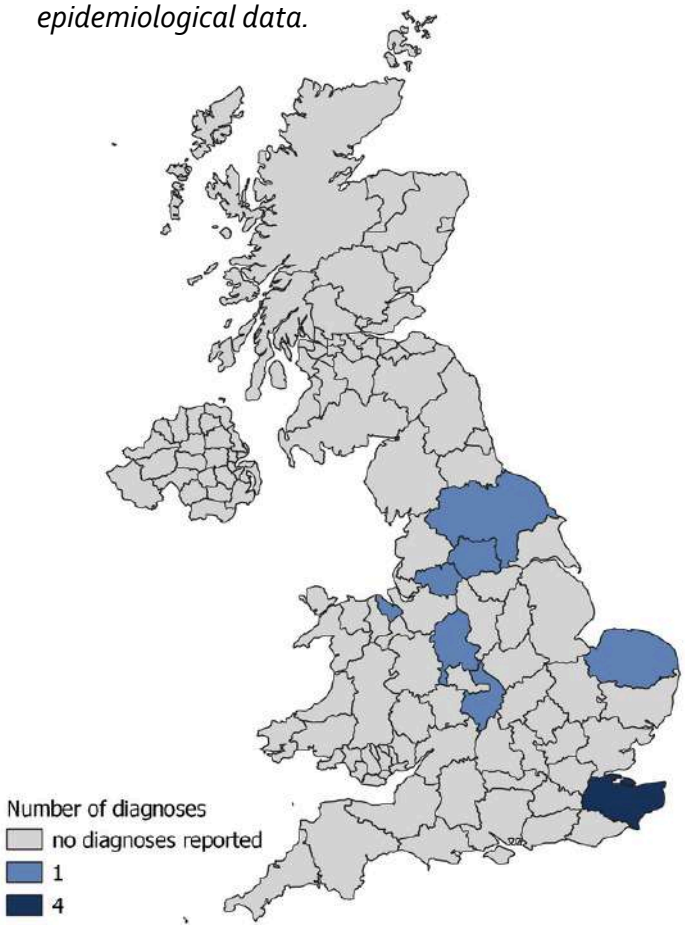
Equine Influenza

SUMMARY

In July 2024, Rossdales Laboratories reported three outbreaks of equine influenza (EI). In August 2024, Rossdales Laboratories reported two outbreaks and Rainbow Equine Hospital reported one outbreak. In September 2024, Rossdales Laboratories, Rainbow Equine Hospital and Axiom Veterinary Laboratories reported one outbreak each.

Information regarding these nine reported outbreaks is summarised in Table 2.

NB: *Figures in the UK Infectious Disease Report may differ, due to EIDS lacking permission to report some outbreaks or not receiving real-time epidemiological data.*



Frequency of reported laboratory diagnoses of EI across the UK during 2024 Q3.

Two additional EI outbreaks were reported to EIDS, however, no epidemiological data could be obtained, due to either the submitting veterinary practice not providing the necessary data or a request for the information not to be circulated.

Table 2: Equine influenza outbreaks reported 1 Jul to 30 Sep 2024.

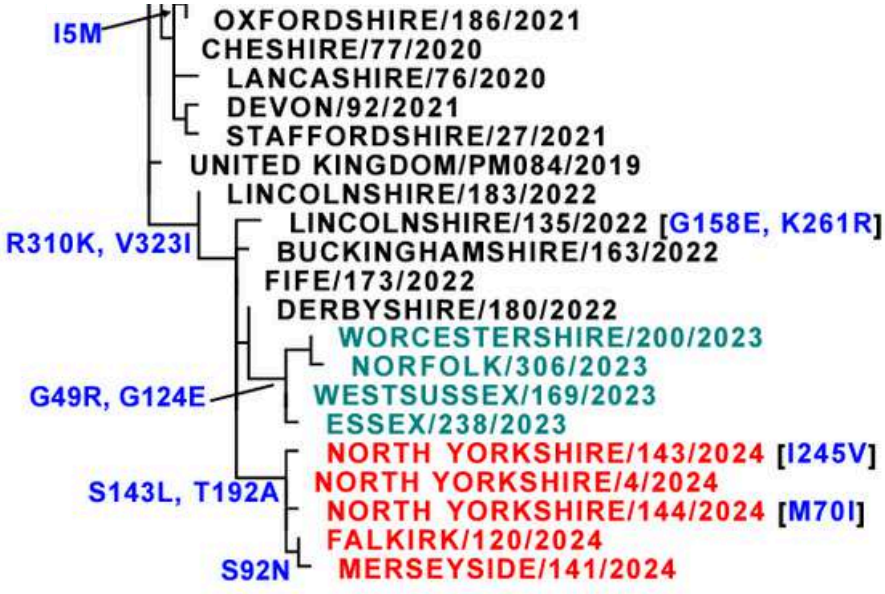
Total outbreaks reported	**9**	
	n	%
Total horses sampled	11	100%
Sample type		
Swab	11	100%
Nasopharyngeal	11	100%
Signalment		
Sex of horse indicated	10	91%
Female	7	70%
Male	3	30%
Breed of horse	10	91%
Native UK pony	3	30%
Sports horses	1	10%
Native UK horse	6	60%
Age of horse	10	91%
Range	1 - 11 years	
IQR	4 - 5 years	
Median	4.5 years	
Clinical signs reported*	33	
Coughing	9	27%
Lethargy	2	6%
Nasal discharge	10	30%
Pyrexia	4	12%
Inappetence	1	3%
Lymphadenopathy	6	18%
Ocular discharge	1	3%
Vaccination status	11	100%
Unvaccinated	10	91%
Vaccinated	1	9%
Premises type	10	91%
Livery	4	40%
Private	2	20%
Riding school	3	30%
Competition	1	17%
**From 10 diagnoses*		

HBLB SURVEILLANCE SCHEME

Veterinary surgeons suspecting EI can submit samples for PCR testing with the scheme covering the cost of the laboratory testing. Veterinary surgeons wishing to use this scheme can sign up here: www.equinesurveillance.org

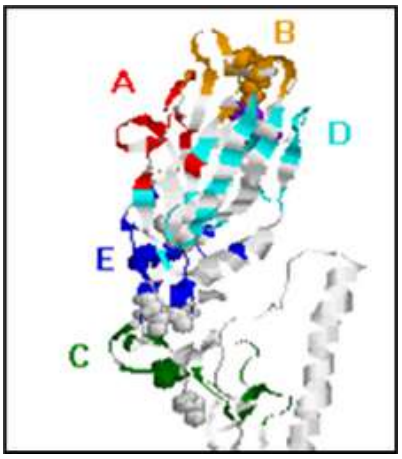
2024 Q3 EI SEQUENCE ANALYSIS

Twenty-four viral isolates were sequenced for all eight genome segments in Q3 2024. All were found to belong to the Florida Clade 1 viral lineage, the only lineage currently reported to be present in Europe. Continued antigenic drift is seen within these viruses.



Phylogenetic Tree of HA1 showing Amino Acid changes in representative Equine Influenza Viruses 2020-2024

The Q3 viruses are all closely related to an isolate first identified in January 2024 in the UK. All these viruses contain two amino acid changes located in the haemagglutinin major antigenic sites A (S143L) and B (T149A) not seen in earlier European Clade 1 viruses. Ten out of the 24 isolates also contain a third amino acid change located in antigenic site C (S92N) of the haemagglutinin protein.



Amino Acid	Antigenic Site
S143L	A
T192A	B
S92N	C

Equine influenza virus sequence analysis updates are provided by the HBLB funded Equine Virology team based at the University of Cambridge Department of Veterinary Medicine.

Surveillance of Equine Strangles

Table 3: *S. equi* samples reported 1 Jul to 30 Sep 2024.

	n	%
Total horses sampled	73	100%
Sample type*	81	
Swab	43	53%
Nasopharyngeal	32	74%
Nasal	8	19%
Abscess material	1	2%
Other	2	5%
Guttural pouch lavage	35	43%
Other	3	4%
Diagnostic tests		
PCR only requested	62	85%
PCR and culture requested	5	7%
Culture only requested	4	6%
iiPCR	2	3%
Signalment		
Sex of horse indicated	53	73%
Female	27	37%
Male	26	73%
Breed of horse	52	71%
Native UK pony	20	39%
Sports horse	15	29%
Crossbreed	9	17%
UK native horse	7	14%
Non-UK native horse	1	2%
Age of horse	50	69^
Range	3 months - 33 yrs	
IQR	3 - 13 yrs	
Median	6 yrs	
Clinical signs reported**	67	
Nasal discharge	27	40%
Pyrexia	14	21%
Glandular swelling	11	16%
Abscess	6	9%
Other	2	3%
Coughing	2	3%
Lethargy	2	3%
Guttural pouch empyema	2	3%
Chondroids	1	2%
Reason for sampling reported	48	66%
Total reasons*	54	
Clinically ill horse	31	57%
Post infection screening	12	22%
Strangles suspected	4	7%
Post seropositive ELISA	3	6%
Pre/post movement screening	2	4%
Other	2	4%

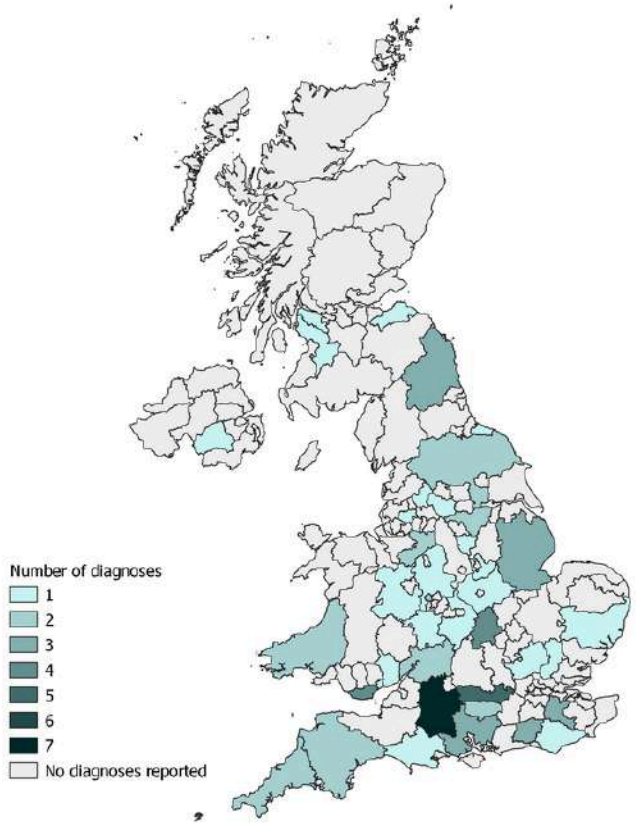
**can include multiple entries per submission*

***From 36 diagnoses*

The Surveillance of Equine Strangles network enables the ongoing assessment of the disease's true welfare impact, highlighting trends over time and different geographical areas across the UK. The SES network is comprised of ten diagnostic laboratories based across the UK.

A total of 73 cases with positive diagnoses of *S. equi* were reported by SES Laboratory during Q3 2024 from samples submitted by 51 veterinary practices in the UK. Information regarding reported samples is summarised in Table 3.

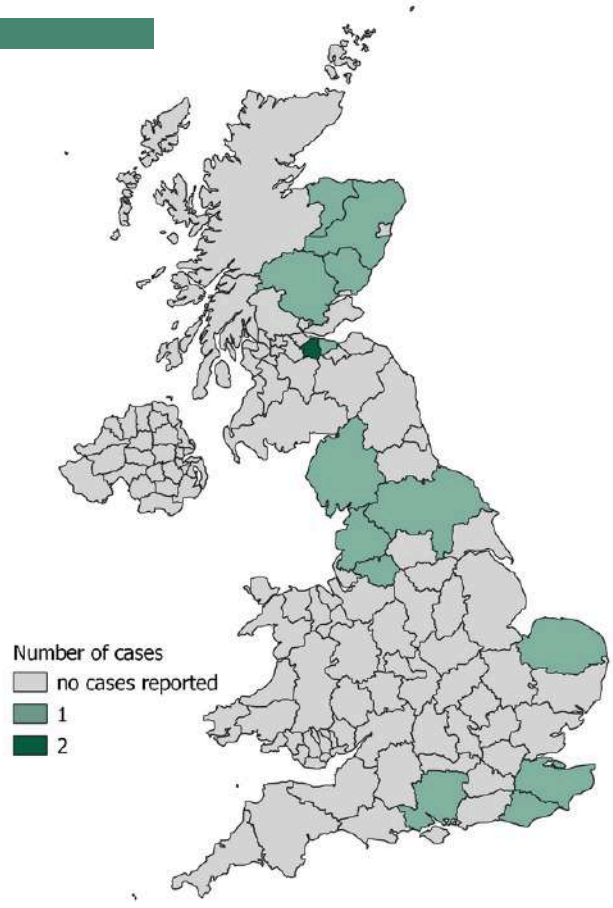
NB: *Figures in the UK Infectious Disease Report may differ, due to EIDS lacking permission to report some outbreaks or not receiving real-time lab data.*



Frequency of reported laboratory diagnoses of *S. equi* across the UK from SES during 2024 Q3. Diagnoses are mapped by submitting vet practice location.

Equine Grass Sickness

An equine grass sickness (EGS) surveillance scheme was established in spring 2008 facilitating the investigation of changes in geographical distribution and incidence of EGS in Great Britain. Having up to date anonymised reports from across the country provide accurate representation of EGS cases nationwide and is vital to help continue epidemiological research into the disease. Reporting cases of EGS to the Equine Grass Sickness Fund (EGSF) can be done by either the attending veterinary surgeon or the owner, at http://grasssickness.org.uk/casereports.



Frequency of EGS cases reported to the EGSF across the UK during 2024 Q3.

In Q3 2024 15 cases of EGS were reported to EGSF. Cases were reported across England (n= 8, 53%) and Scotland (n= 7, 47%). Information regarding reported cases is summarised in Table 4. **Where premises history was known (n= 3/15), all three premises had a history of EGS.**

Table 4: Equine Grass Sickness cases reported to the EGSF 1 Jul to 30 Sep 2024.

	n	%
Total horses sampled	15	100%
EGS presentation	15	100%
Acute	11	73%
Subacute	1	7%
Chronic	3	20%
EGS outcome	15	100%
Survivor	0	0%
Non-survivor	15	100%
EGS diagnoses	12	80%
Clinical signs alone	7	58%
Histological confirmation	5	42%
Month of diagnosis	15	100%
July	8	53%
August	4	27%
September	3	20%
Signalment		
Sex of horse indicated	12	80%
Female	4	33%
Male	8	67%
Breed of horse	14	93%
Native UK pony	6	43%
Native UK horse	5	36%
Sports horse	3	21%
Age of horse	11	73%
Range	1-15 years	
IQR	3.5 - 5.5 years	
Median	4 years	

Please note that figures for EGS contained in the laboratory report may differ to the number of cases reported here, which are reported by both owners and veterinary surgeons.

VIROLOGY

The results of virological testing for July to September 2024 are summarised in Tables 5 to 8. Please note, APHA's sample population is different to the other contributing laboratories as their tests are principally in relation to international trade.

GASTROINTESTINAL DISEASE

Table 5: Results of virological testing for gastrointestinal diseases between 1 Jul to 30 Sep 2024. CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
Adenovirus HI	Antibody	28	0	1
Coronavirus PCR	Agent	42	0	4
Rotavirus antigen ELISA/Strip test/LFT	Agent	29	1	6
Rotavirus ELISA	Antibody	1	0	1
Rotavirus-A PCR	Agent	55	7	3
Rotavirus-B PCR	Agent	55	0	3

LFT Lateral flow test

RESPIRATORY DISEASE

Table 6: Results of virological testing for respiratory diseases between 1 Jul to 30 Sep 2024. CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
EHV-2 PCR	Agent	19	3	2
EHV-5 PCR	Agent	19	2	3
Influenza HI (APHA)	Antibody	0	0	1
Influenza HI	Antibody	27	0	1
Influenza IFAT	Agent	0	0	1
Influenza LAMP	Agent	10	0	2
Influenza PCR (APHA)	Agent	182	0	1
Influenza PCR	Agent	498	18*	9
ERV-A/B CFT	Antibody	17	0	1
ERV PCR	Agent	0	0	1

EHV Equine herpes virus, HI Haemagglutination inhibition, LAMP loop mediated isothermal amplification, ERV Equine rhinitis virus, CFT Complement fixation test, IFAT immunofluorescent antibody test *Figures reported here may differ to the endemic diseases section due to EIDS not receiving details from the submitting veterinary practice or the owner requesting details not to be circulated

MULTIPLE/MISCELLANEOUS/NEUROLOGICAL DISEASES

Table 7: Results of virological testing for multiple/miscellaneous/neurological diseases between 1 Jul to 30 Sep 2024. CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
EHV-1 LAMP	Agent	12	0	2
EHV-1 PCR (APHA)	Agent	51	0	1
EHV-4 PCR (APHA)	Agent	51	0	1
EHV-1 PCR	Agent	786	5	11
EHV-1 VI	Agent	0	0	1
EHV-4 LAMP	Agent	12	2	2
EHV-4 PCR	Agent	786	46	11
EHV-4 VI	Agent	0	0	1
EHV-1/-4 CFT (APHA)	Antibody	0	0	1
EHV-1/-4 CFT	Antibody	270	4	2
EHV-1/-4 IFAT - Ag	Agent	0	0	1
EHV-1 IFAT - Ag	Agent	0	0	1
EHV-8 PCR	Agent	0	0	1
EIA Coggins (APHA)	Antibody	7150	0	1
EIA Coggins	Antibody	14	0	7
EIA ELISA	Antibody	352	0	9
Hepacivirus PCR	Agent	19	0	1
Papilloma virus PCR	Agent	4	2	1
Parvovirus PCR	Agent	19	0	1
WNV IgG ELISA (APHA)	Antibody	0	0	1
WNV IgM ELISA (APHA)	Antibody	0	0	1
WNV PCR (APHA)	Agent	0	0	1

EHV Equine herpes virus, LAMP loop mediated isothermal amplification, VI Virus isolation, CFT Complement fixation test, IFAT immunofluorescent antibody test, EIA Equine infectious anaemia, WNV West Nile Virus

Table 8: Results of virological testing for reproductive diseases between 1 Jul to 30 Sep 2024. CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
EHV-3 PCR	Agent	5	3	1
EHV-3 VI	Agent	0	0	1
EHV-3 VN	Antibody	3	3	1
EVA ELISA*	Antibody	809	11	10
EVA PCR (APHA)	Agent	2	0	1
EVA PCR	Agent	3	0	1
EVA VN (APHA)**	Antibody	437	4	1
EVA VN**	Antibody	38	26	5

EHV Equine herpes virus, VI Virus isolation, VN Virus neutralisation, EVA Equine viral arteritis, *positive samples then undergo VN testing as the confirmatory test, ** Due to the unavailability of the EVA vaccine since March 2023, all stallions now have lapsed vaccination status. If sero-positivity cannot be attributed to prior vaccination and confirmed by testing alongside archived serial samples that show a stable or declining titre, the case must be reported to APHA for investigation under the EVA Order 1995. Additionally, mares that are sero-positive within two weeks of mating must also be investigated.

BACTERIOLOGY

A summary of the diagnostic bacteriology testing undertaken by different contributing laboratories is presented in Tables 9 to 12. The BEVA laboratory registering scheme is for the testing of CEM (*Taylorella equigenitalis*), *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. Granting and maintenance of approval depends on a laboratory achieving correct results in quality assurance tests and reporting data to this report. BEVA publishes a list of approved laboratories annually. Fifteen BEVA approved laboratories in the UK contributed data.

REPRODUCTIVE DISEASE

Table 9: Results of bacteriological testing for reproductive diseases between 1 Jul to 30 Sep 2024. CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
CEM *Taylorella equigenitalis* PCR (BEVA)	Agent	388	0	10
CEM *Taylorella equigenitalis/asinigenitalis* culture^ (BEVA)	Agent	669	0	15
CEM *Taylorella equigenitalis* PCR (APHA)	Agent	238	0	1
CEM *Taylorella equigenitalis/asinigenitalis* culture^ (APHA)	Agent	1507	0	1
Klebsiella pneumoniae capsule types 1 PCR	Agent	1	0	1
Klebsiella pneumoniae capsule types 2 PCR	Agent	1	0	1
Klebsiella pneumoniae capsule types 5 PCR	Agent	1	0	1
Klebsiella pneumoniae PCR (BEVA)	Agent	764	6	16
Klebsiella pneumoniae culture (APHA)	Agent	69	3	1
Klebsiella pneumoniae culture (BEVA)	Agent	388	3	9
Pseudomonas aeruginosa PCR (BEVA)	Agent	388	3	8
Pseudomonas aeruginosa culture (APHA)	Agent	69	0	1
Pseudomonas aeruginosa culture (BEVA)	Agent	855	5	17

CEM contagious equine metritis (*Taylorella equigenitalis*), ^*Taylorella asinigenitalis* and *Taylorella equigenitalis* are morphologically indistinguishable by culture and therefore if a sample is positive by culture, it should be screened for both species by multiplex PCR, BEVA British Equine Veterinary Association approved laboratories

RESPIRATORY DISEASE

Table 10: Results of bacteriological testing for respiratory diseases between 1 Jul to 30 Sep 2024. CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
Streptococcus equi ELISA Antigen A/C (ISL)†	Antibody	3884	463	6
Streptococcus equi ELISA M-protein (IDVET)	Antibody	700	169	1
Streptococcus equi PCR	Agent	1972	94	11
Streptococcus equi LAMP	Agent	15	0	2
Streptococcus equi culture	Agent	669	18	11
Rhodococcus equi ELISA#	Antibody	39	17	2
Rhodococcus equi PCR	Agent	75	10	4
Rhodococcus equi culture	Agent	545	11	7
Streptococcus zooepidemicus PCR	Agent	308	143	6
Streptococcus zooepidemicus culture	Agent	384	58	7

†seropositivity may be attributed to disease exposure, infection or carrier states, #seropositives include exposure to the virulent form of *R. equi* or the presence of maternally derived antibodies, LAMP loop mediated isothermal amplification. The *S. equi* agent detection tests presented here are for individual tests, not individual horses. Therefore, they differ from the SES data presented in Table 3, which represents individual cases

MISCELLANEOUS DISEASE

Table 11: Results of miscellaneous bacteriological testing between 1 Jul to 30 Sep 2024. CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
MRSA culture	Agent	799	4	10
Borrelia burgdorferi ELISA	Antibody	51	12	4
Borrelia burgdorferi PCR	Agent	0	0	1
Borrelia burgdorferi LFT	Antibody	0	0	1
Burkholderia mallei (Glanders) CFT (APHA)	Antibody	582	0	1
Leptospira MAT	Antibody	0	0	1
Leptospira PCR	Agent	2	0	1
Anaplasma ELISA	Antibody	51	6	3
Anaplasma PCR	Agent	0	0	2

MRSA methicillin resistant *Staphylococcus aureus*, LFT Lateral flow test, CFT Complement fixation test, MAT microagglutination testing antibody

GASTROINTESTINAL DISEASE

Table 12: Results of bacteriological testing for gastrointestinal diseases between 1 Jul to 30 Sep 2024. CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
Campylobacter culture	Agent	21	5	7
Clostridium perfringens ELISA	Toxin	167	0	4
Clostridium perfringens LFT	Toxin	53	0	3
Clostridium perfringens PCR	Agent	14	5	3
Clostridium perfringens culture	Agent	0	0	1
Clostridium difficile ELISA	Toxin	129	17	4
Clostridium difficile LFT	Toxin	88	12	4
Clostridium difficile PCR	Agent	17	0	3
Clostridium difficile culture	Agent	0	0	1
Lawsonia intracellularis IPMA	Antibody	18	2	2
*Lawsonia intracellularis*** PCR	Agent	48	4	4
Salmonella Typhimurium‡ PCR	Agent	31	0	3
Salmonella Typhimurum‡ WGS (APHA)	Agent	6	3	1
Salmonella Typhimurium‡ culture	Agent	34	2	8
Salmonella Other *spp*‡ PCR	Agent	91	1	8
Salmonella Other *spp*‡ WGS (APHA)	Agent	6	3	1
Salmonella Other *spp*‡ culture	Agent	312	4	12
Enterobacter culture	Agent	2069	134	7
E. coli culture	Agent	2075	330	9

LFT Lateral flow test, WGS whole genome sequencing **identified using PCR applied to faeces, IPMA immunoperoxidase monolayer assay, ‡Under the Zoonoses Order 1989, it is a statutory requirement to report and serotype positive cases for *Salmonella spp*. A positive case may have repeat samples taken.

APHA *SALMONELLA* RESULTS

Six samples were submitted this quarter to the Animal and Plant Health Agency (APHA) and all were positive for *Salmonella*. From the incidents involving isolates typed by the APHA, the serovars/phagetypes reported were *S.* Enteritidis PT8, *S.* Enteritidis PT9a, *S.* Typhimurium DT116, *S.* Typhimurium DT75 and *S.* Eastbourne.

Salmonella Typhimurium DT116 and DT75 have been associated with a number of different sources including livestock, dogs and pet food while *S.* Enteritidis is typically associated with humans and poultry. *Salmonella* Eastbourne is a not a commonly isolated serovar and is found in a range of species but has not been recorded previously in horses in GB. This wide range of associations highlights the zoonotic potential of *Salmonella* infections which is particularly important in companion animals such as horses.

For more information from APHA about *Salmonella* in Great Britain, please see the 2023 *Salmonella* in animals and feed surveillance report www.gov.uk/government/publications/salmonella-in-animals-and-feed-in-great-britain

PARASITOLOGY

A summary of parasitology testing undertaken by contributing laboratories is presented in Tables 13 and 14.

ECTOPARASITES AND OTHER SKIN PATHOGENS

Table 13: Results of ectoparasitology testing between 1 Jul to 30 Sep 2024.
CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
Mange *Sarcoptes scabiei*	Agent	345	1	12
Mange *Chorioptes spp*	Agent	345	5	12
Mange *Trombicula spp*	Agent	327	1	9
Mange *Demodex equi*	Agent	328	0	11
Lice *Damalinia equi*	Agent	329	3	9
Lice *Haematopinus asini*	Agent	312	0	9
Ringworm PCR	Agent	103	22	5
Ringworm culture	Agent	48	3	9
Ringworm microscopy	Agent	391	96	12
Dermatophilosis culture	Agent	22	0	5
Dermatophilosis microscopy	Agent	80	14	6
Candida culture	Agent	77	6	5
Candida microscopy	Agent	1	0	2

Table 14: Results of endoparasitology testing between 1 Jul to 30 Sep 2024.
CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
Ascarids faecal exam	Agent	42522	178	15
Strongyles (large/small) faecal exam	Agent	42796	10373	18
Strongyloides faecal exam	Agent	41918	552	12
Tapeworm ELISA saliva	Antibody	6642	1857	1
Tapeworm ELISA serum	Antibody	931	379	2
Tapeworm faecal exam	Agent	40257	169	10
Oxyuris equi faecal exam	Agent	37169	7	7
Oxyuris equi tape strip	Agent	399	18	9
Dictyocaulus arnfieldi Baermanns	Agent	51	0	6
Fasciola hepatica serology	Antibody	0	0	1
Fasciola hepatica faecal exam	Agent	73	1	6
Fasciola hepatica sedimentation	Agent	53	1	5
Cryptosporidia mZN	Agent	4	0	2
Cryptosporidia PCR	Agent	0	0	2
Cryptosporidia snap test	Agent	66	1	5
Cryptosporidia strip test	Agent	6	0	1
Cryptosporidia faecal exam	Agent	4	0	2
Giardia smear test	Agent	4	0	1
Giardia snap test	Agent	47	5	3
Coccidia faecal exam	Agent	2096	3	6

TOXICOSIS

A summary of diagnostic toxicosis testing undertaken by contributing laboratories is presented in Table 15. Results for toxicosis are based on histopathology or clinical signs.

Table 15: Results of toxicosis testing between 1 Jul to 30 Sep 2024.
CLs = contributing laboratories

Test	Samples tested (n)	Positive (n)	CLs (n)
Grass Sickness*	14	6	2
Atypical myopathy/Seasonal Pasture Associated Myopathy	0	0	1
Hepatic Toxicosis - Ragwort	47	10	3
Hepatic Lipidosis	4	2	1
Hepatic Encephalopathy	5	4	1
Tetanus	0	0	1
Botulism	1	1	2

*Figures for EGS contained in the EGSF Report may differ to the number of cases reported here, which are laboratory reported cases only.

MISCELLANEOUS

A summary of miscellaneous testing undertaken by contributing laboratories is presented in Table 16.

Table 16: Results of miscellaneous testing between 1 Jul to 30 Sep 2024.
CLs = contributing laboratories

Test	Detection	Samples tested (n)	Positive (n)	CLs (n)
Babesia caballi CFT (APHA)	Antibody	11	0	1
Babesia caballi cELISA (APHA)	Antibody	394	0	1
Babesia caballi IFAT (APHA)	Antibody	444	1	1
Babesia caballi cELISA	Antibody	61	2	1
Theileria equi CFT (APHA)	Antibody	11	0	1
Theileria equi cELISA (APHA)	Antibody	394	5	1
Theileria equi IFAT (APHA)	Antibody	444	4	1
Theileria equi cELISA	Antibody	61	3	1
Dourine CFT* (APHA)	Antibody	519	4	1
Dourine IFAT (APHA)	Antibody	11	0	1

CFT Complement fixation test, IFAT Immunofluorescent antibody test , *CFT suspect/positive samples are then tested by IFAT as a confirmatory test for Dourine

LABORATORY REPORT END

UK *Post-Mortem* Examination Reports

Details about *post-mortem* examinations (PME) were reported by four UK Veterinary Schools and four other contributing laboratories. Data from each laboratory is organised by the laboratories' regional locations. There may be more than one laboratory reporting information for each region.

EAST & SOUTH EAST OF ENGLAND

ABORTION

A total of 11 cases were reported:

Diagnosis	No. of cases	Comments
Umbilical cord torsions	8	Three confirmed, five with a 'probable' level of certainty. One case also had early ischaemic necrosis of the cervical pole and one had mild urachal dilatation
Placentitis	1	One case had an uncertain diagnosis but was possibly due to placentitis
Placental abnormality	1	An amniotic band resulting in hindlimb constriction and necrosis
Ischaemic necrosis of the cervical pole	1	With concurrent placental mineralisation

RESPIRATORY

One case was reported:

- One case with severe pulmonary oedema with multifocal myocardial necrosis and concurrent cholestasis and moderate biliary hyperplasia with an uncertain aetiology

MUSCULOSKELETAL

One case was reported:

- One case of degenerative lumbar osteoarthropathy (intervertebral body spondylosis and intertransverse joint)

FOAL DEATHS

Seven cases were reported:

- Two cases of rhodococcal pneumonia. One case died suddenly. The other case had concurrent enterocolitis and lymphadenitis
- Two cases of gastric ulceration and perforation leading to septic peritonitis
- One catheter-associated air embolism leading to sudden death
- One case of grass sickness with coincidental endoparasitism (Eimeria, cyathostomes and tapeworm)
- One case of segmental ulcerative and necrotising jejunitis with no initiating cause identified, with post-surgical adhesions and secondary jejejunal entrapment and partial strangulation

HEPATIC

Two cases were reported:

- A seven-year old with pyrrolizidine alkaloid toxicity, confirmed by PME and histopathology. Microscopic examination of the liver revealed moderate bridging portal fibrosis with marked megalocytosis, multifocal hepatocyte rarefaction, a mild ductular reaction and multifocal mild lymphoplasmacytic infiltrate
- A 19-year-old with hepatic fibrosis and a renal infarct. Histopathological findings included hepatocyte karyomegaly and rare multinucleation that could be consistent with ragwort exposure

NEOPLASTIC

Five cases were reported:

- One case with haemangiosarcoma affecting the spleen, perirenal/sublumbar region, adrenals, liver, lung, epidural (T11-12 and L3-4), mesenteric and mediastinal regions
- One case with lymphoma at the ileocaecal junction
- One 29-year-old case with a pheochromocytoma, confirmed by gross PME and histopathology
- One 20-year-old case with an acute pathological fracture of the left tibia and neoplasms in multiple endocrine tissues (parathyroid and thyroid glands), confirmed as chief cell neoplasia by gross PME and histopathology
- One 16-year-old case with a round cell tumour involving the pancreas but with spread to the mesenteric lymph nodes and intestinal wall, confirmed by gross PME and histopathology

RENAL

One case was reported:

- A donkey with bilateral, severe, chronic kidney disease. There were glomerular changes consistent with a late stage membranoproliferative glomerulonephritis of unknown cause

GASTROINTESTINAL

A total of 10 cases were reported:

Location	Diagnosis	No. of cases	Comments inc. additional PME findings
Small intestine	Multifocal eosinophilic enteritis	1	Portal hepatitis
	Perforating jejunal ulcer	1	Endocardiosis and endocarditis of the pulmonic valve
	Mesenteric rent	2	One 15-year-old case with a history of recurrent colic. Segmental jejunal strangulation confirmed by gross PME One 10-year-old case with herniation and entrapment of multiple segments of the small intestine through a large rent in the mesentery, confirmed by gross PME
	Pedunculated lipoma	1	One 24-year-old case confirmed by gross PME and histopathology
	Volvulus	1	One 19-year-old case with a segment of devitalised and infarcted distal small intestine, with suggestion of caecal involvement/compromise, as well as subjectively abnormal contents in the pelvic flexure and increased content in the stomach, confirmed by gross PME. A specific cause for the reported volvulus was not identified
	Complications following recent colic surgery	2	One case on gross PME had an intact jejunocaecostomy, the ileal serosa was dark with red striations, the right and left ventral colon contained firm dry fibrous content coated in inspissated mucus and the small intestine contained profuse watery content One case with a history of enterectomy and peritonitis. There were no abnormalities to the anastomosing enterectomy. At the root of the mesentery there was a large partially self-adherent mass comprising of pancreas, mesentery and mesenteric fat which was connected to the suture line in the mesentery, suggesting a degree of post operative steatitis and pancreatis, causing peritonitis

Location	Diagnosis	No. of cases	Comments inc. additional PME findings
Large intestine	Fibrinonecrotising colitis	1	One 13-year-old case. Bacteriological cultures did not isolate a definitive pathogenic bacterium but the histological appearance strongly suggested a bacterial aetiology
Misc.	No diagnosis reached	1	One 13-year-old donkey with a history of recurrent colic. There was marked autolysis and putrefaction at gross PME but there was no evidence of significant pathology present

NORTH WEST OF ENGLAND

RENAL

One case was reported:

- A 45-year-old case from North Yorkshire with pyelonephritis, a pars intermedia pituitary adenoma and hydatid cysts in the liver. Diagnosis was confirmed by gross PME, with histology results pending

WELFARE

Two cases were reported:

- A 22-year-old case that was emaciated and had a lung hyatid cyst and gastrophilus larvae in the stomach. Diagnosis was confirmed by gross PME, with histology results pending
- A 34-year-old case with chronic laminitis, chronic dental disease and healing rib fractures from suspected blunt force trauma. Diagnosis was confirmed by gross PME, histology and a CT scan of the limbs

NORTHERN IRELAND

NEONATAL DEATH

One case was reported:

- A single case of intra-abdominal haemorrhage was reported in a three-week-old, confirmed by gross PME

SCOTLAND

RESPIRATORY

One case was reported:

- One 11-year-old case with a ruptured oesophageal diverticulum, hydrothorax and severe fibrinous pleuritis was examined

WEST AND SOUTH WEST OF ENGLAND

ABORTION

One case was reported:

- The case was an abortion in Gloucestershire and was EHV-1 negative, the placenta looked grossly abnormal and histopathology results are pending

GASTROINTESTINAL

Four cases, all confirmed by gross PME, were reported:

- A 10-year-old case from Gloucestershire found dead in the field with a diaphragmatic hernia and intestinal entrapment
- A 32-year-old case from Devon with fibrinous ileitis, chronic laminitis and tracheal collapse
- An 18-year-old with an impaction colic
- An aged case with dental disease

HEPATIC

One case was reported:

- A seven-year-old with a hepatopathy, confirmed by gross PME

NEOPLASIA

One case was reported:

- A 30-year-old with melanomas, confirmed by gross PME

MUSCULOSKELTAL

Two cases were reported:

- A 10-year-old case from Gloucestershire with thrombophlebitis of the cranial tibial vein that was non-responsive to treatment. Positive diagnosis was confirmed by gross PME and histopathology
- A seven-year-old with a sub-solar abscess, confirmed by gross PME

OPHTHALMIC

One case was reported:

- A 29-year-old with a corneal ulcer, confirmed by gross PME

International Collating Centre

ICC 2024 Q3 SHORT REPORT

The International Collating Centre (ICC) Q3 2024 report has been circulated to subscribers. A short summary is presented below with the full version available online (https://equinesurveillance.org/iccview/resources/202403summ.pdf), countries are coded according to ISO 3166 international standard. The ICC provides almost daily email updates on national and international equine disease outbreaks, contact equinesurveillance@vet.cam.ac.uk to subscribe. Current and previous outbreak reports can be found online in an interactive platform www.equinesurveillance.org/iccview/.

ICC 2024 Q3

433 reports issued
averaging 7 reports per working day

RESPIRATORY CONDITIONS (181 reports)

EHV-1
(n=8)

FR NL ZA UK USA

EQUINE INFLUENZA
(n=16)

BE CA DE NL UK USA

EHV-4
(n= 26)

FR DE NL UK

STRANGLES
(n= 87)

CA FR DE NL SE CH USA

EHV-5
(n=1)

BE

RHODOCOCCUS EQUI
(n= 42)

FR IE NL

S. ZOOEPIDEMICUS
(n= 1)

SE

GASTROINTESTINAL CONDITIONS (13 reports)

SALMONELLOSIS
(n= 8)

CA NL

CORONAVIRUS
(n= 1)

NL

RHODOCOCCUS EQUI
(n= 4)

FR

REPRODUCTIVE CONDITIONS (7 reports)

EHV-1
(n= 3)

JP ZA SE

EHV-3
(n= 3)

FR CH

CEM
(n= 1)

DE

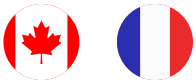
NEUROLOGICAL CONDITIONS (210 reports)

EHV-1
(n= 5)

ZA SE

UK USA

WNV
(n= 132)



CA FR

DE USA

EEE
(n= 72)

CA USA

LYME DISEASE
(n= 1)

CH

MISCELLANEOUS CONDITIONS (22 reports)

NEW WORLD SCREW WORM
(n= 1)

HN

POTOMAC HORSE FEVER
(n= 2)

USA

AHS
(n= 2)

ZA KE

EIA
(n= 8)

BG USA

EVA
(n= 1)

PT

ANAPLASMOSIS
(n= 1)

CH

PIROPLASMOSIS
(n= 4)

NL ZA LC

LEPTOSPIROSIS
(n= 2)

CH

PIGEON FEVER
(n= 1)

USA

International Collating Centre

The ICC continues to be a vital resource in the ongoing monitoring and management of equine health worldwide.

ACKNOWLEDGEMENTS

We are extremely grateful to the following 30 laboratories for contributing data for this report

- Agri-Food & Biosciences Institute of Northern Ireland
- Animal and Plant Health Agency
- Ashbrook Equine Hospital
- Austin Davis Biologics Ltd
- Axiom Veterinary Laboratories Ltd
- B&W Equine Group Ltd
- Biobest Laboratories Ltd
- BioTe
- The Donkey Sanctuary
- Donnington Grove Veterinary Group
- Hampden Veterinary Hospital
- The Horse Trust
- IDEXX Laboratories
- Langford Veterinary Services
- Liphook Equine Hospital
- Nationwide Laboratories
- Newmarket Equine Hospital
- Rainbow Equine Hospital
- Rossdales Laboratories
- Royal Veterinary College
- Sussex Equine Hospital
- Three Counties Equine Hospital
- University of Bristol
- University of Cambridge
- University of Glasgow
- University of Liverpool
- Valley Equine Hospital
- VPG (Veterinary Pathology Group) Exeter
- VPG (Veterinary Pathology Group) Leeds
- Westgate Laboratories Ltd

All laboratories contributing to this report operate Quality Assurance schemes. These schemes differ between laboratories; however, all the contagious equine metritis testing reported was accredited by BEVA, with the exception of the APHA, which acts as the reference laboratory.

We are extremely grateful to the Horserace Betting Levy Board (HBLB), Racehorse Owners Association (ROA) and Thoroughbred Breeders' Association (TBA) for their continued combined contribution to Equine Infectious Disease Surveillance.

We welcome feedback including contributions on focus articles to the following address:

Email: equinesurveillance@vet.cam.ac.uk
Website: www.equinesurveillance.org

Equine Quarterly Disease Surveillance Report
Volume 20, No. 3, Jul – Sep 2024