Animal & Plant Health Agency

Zoonoses and veterinary public health

Annual report 2024

Project FZ2100

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APHA is an Executive Agency of the Department for Environment, Food and Rural Affairs and also works on behalf of the Scottish Government, Welsh Government and Food Standards Agency to safeguard animal and plant health for the benefit of people, the environment and the economy.

Contents

Background

Monitoring the occurrence of certain animal diseases can highlight the potential for zoonotic transmission and provide an indication of human, environmental, and foodborne health risks. These Zoonoses and Veterinary Public Health reports summarise the surveillance activities of the Animal and Plant Health Agency (APHA), APHA partner postmortem providers and Scotland's Rural College (SRUC) Veterinary Services, for zoonoses and infections shared between humans and animals in Great Britain. Data (which primarily relates to farmed animal species) gathered by the network of Veterinary Investigation Centres is used for the production of the quarterly and annual report summaries. Quantitative diagnostic data for all of Great Britain is provided by the Veterinary Investigation Diagnosis Analysis (VIDA) surveillance system. Summaries of veterinary public health investigations into incidents and outbreaks of zoonotic disease and associated activities are also included. This report covers the relevant VIDA data and zoonoses investigations for 2024.

The Zoonoses and Veterinary Public Health project (designated the FZ2100 project) is funded by Defra, the Scottish Government and the Welsh Government through the APHA's Bacterial Diseases and Food Safety portfolio. The FZ2100 project also uses returns from scanning surveillance projects.

This report provides information about non-statutory zoonoses, as well as *Coxiella burnetii* (Q fever), avian chlamydiosis (in psittacines), and brucellosis in dogs, which were made reportable in Great Britain in 2021. The detection of *C. burnetii* and brucellosis in dogs were made reportable through amendments to the Zoonoses Order (2021). The Psittacosis (Ornithosis) Order is the legislation that covers avian chlamydiosis. Non-statutory zoonoses are defined as any zoonoses for which no specific animal-health derived legislation exists and so excludes *Salmonella* and those diseases which are compulsorily notifiable in specified animal species, for example, tuberculosis (TB), which is notifiable in all mammals. Information concerning notifiable and other reportable zoonoses is recorded elsewhere, some under specific projects such as FZ2000 (*Salmonella*).

1. General scanning surveillance

1.1 Zoonoses VIDA data for Great Britain: January to December 2024

Table 1 (collated 5 February 2025) summarises general scanning surveillance VIDA data for clinical diagnoses of potential zoonotic organisms that may be shared between animals and humans from specimens submitted to APHA, APHA partner postmortem providers and SRUC Veterinary Investigation Centres for the 12-month period between January and December 2024. The table also compares the latest findings with the data for the preceding 2 years, 2023 and 2022. It includes rare zoonotic infections and those for which zoonotic potential is confined predominantly to immunocompromised individuals. Diagnoses use strict criteria and are recorded, once per incident, using the VIDA system.

The list is subject to selection, submission, and testing bias. It is not definitive and excludes notifiable and most reportable diseases, notably salmonellosis, which is recorded elsewhere.

Table 1. General scanning surveillance: Zoonoses VIDA data for Great Britain, January to December 2024 – all species

Table notes:

- species columns are: Cattle; Sheep; Goats; Pigs; Birds; Misc. which includes miscellaneous and exotic farmed species; and Wildlife
- '-' in a cell indicates that a diagnosis is not available for that species
- birds: data for birds includes domestic and wild birds
- wildlife: data for wildlife includes mammals only

VIDA codes	Diagnosis	2022	2023	2024	Cattle	Sheep	Goats	Pigs	Birds	Misc.	Wildlife
311	Babesiasis	23	27	18	18	-	-	-	-	-	-
258, 659	*Brachyspira pilosicoli* (intestinal spirochaetosis)	51	75	150	-	-	-	146	4	-	-
013	*Campylobacter* fetopathy	117	174	97	7	90	0	-	-	0	0
282	Chlamydiosis (*C. psittaci*)	2	0	0	-	-	-	-	0	-	-
014	*Chlamydia abortus* fetopathy	146	150	172	0	172	0	-	-	0	0
732	*Corynebacterium pseudotuberculosis* (CLA)	29	18	22	-	16	6	-	-	-	-
318	Cryptosporidiosis	252	249	204	192	11	0	1	0	0	0
362	Cysticercosis	2	0	3	-	2	1	-	-	-	-
193	*Dermatophilus* infection	4	8	1	1	0	0	-	-	0	0
022, 133, 615	Erysipelas	24	27	26	-	3	0	15	8	0	-
371, 372, 373	Fasciolosis	156	166	159	55	88	7	-	-	9	0
363	Hydatidosis	0	0	0	-	0	-	-	-	-	-

VIDA codes	Diagnosis	2022	2023	2024	Cattle	Sheep	Goats	Pigs	Birds	Misc.	Wildlife
015, 136, 139	Leptospirosis (all categories)	5	5	16	2	0	0	8	-	0	6
016, 140, 150, 189, 711	Listeriosis (all categories)	128	118	135	30	92	11	0	0	0	2
217	Louping ill	36	32	21	1	18	-	-	2	0	-
225	Orf (parapox virus)	25	38	32	-	32	0	-	-	0	-
152,153, 157, 158	*Pasteurella multocida* pneumonia (pasteurellosis)	217	312	298	195	65	1	32	5	0	0
223	Pseudocowpox (parapox virus)	0	0	1	1	-	-	-	-	-	-
027, 262	Q Fever (*Coxiella burnetii)*	3	8	3	3	0	0	-	-	0	0
374	Red Mite *(Dermanyssus gallinae)*	4	3	2	-	-	-	-	2	-	-
195	Ringworm	3	6	3	1	2	0	0	0	0	0
379, 392	*Sarcoptes scabei* infection	2	1	3	0	-	0	2	-	1	-
024, 171, 172, 644	Streptococcal infection (excluding bovine mastitis)	96	126	149	0	7	2	125	0	0	15
745	Swine influenza	30	51	55	-	-	-	55	-	-	-
026, 315	Toxoplasmosis, including fetopathy	135	169	117	-	115	2	-	-	0	0
142	Tuberculosis, excluding bovine *M. bovis*	23	29	27	-	0	0	1	14	11	1
034, 154	Yersiniasis (including fetopathy*)*	15	18	22	5	6	0	10	0	1	0

The table is intended only as a general guide for veterinary and public health professionals to the diagnosed occurrence of animal-associated infections in predominantly farmed animal species in Great Britain.

Common minor diseases of zoonotic importance, such as orf and ringworm, are grossly underestimated by the VIDA recording and reporting system, as it is unusual for practising veterinary surgeons to submit material for diagnosis.

The increased diagnoses of *Brachyspira pilosicoli* in 2024 compared to the previous two years can be partly explained by an increase in the number of submissions tested by culture and PCR for *Brachyspira spp*. with the increased submissions likely to be reflective of heightened awareness regarding swine dysentery (*B. hyodysenteriae*). The diagnostic rate of swine dysentery, when expressed as a percentage of the number of submissions tested, did not increase in 2024, whereas the diagnostic rate for *B. pilosicoli* (expressed as a percentage of the number of submissions tested) increased. The reasons for the increase in the diagnostic rate of *B. pilosicoli* are unknown, however the number of diagnoses and the diagnostic rate will be kept under review by the Pig Expert Group.

Get further information on scanning surveillance activities.

1.2 Highlights from APHA and SRUC disease surveillance centres

This section provides information on a few noteworthy findings of zoonotic interest from material submitted to the APHA (England and Wales), APHA partner postmortem providers and SRUC Veterinary Services (Scotland) during 2024.

Further information is provided in the quarterly reports by the APHA species groups and the monthly surveillance reports in the Vet Record derived from scanning surveillance, which can be found at View APHA surveillance reports, publications and data - GOV.UK

The species expert group quarterly reports provide comprehensive details on scanning surveillance activities, covering avian, cattle, small ruminant, pigs, miscellaneous and exotic farmed species, and wildlife.

Bovine abortion diagnoses during 2024

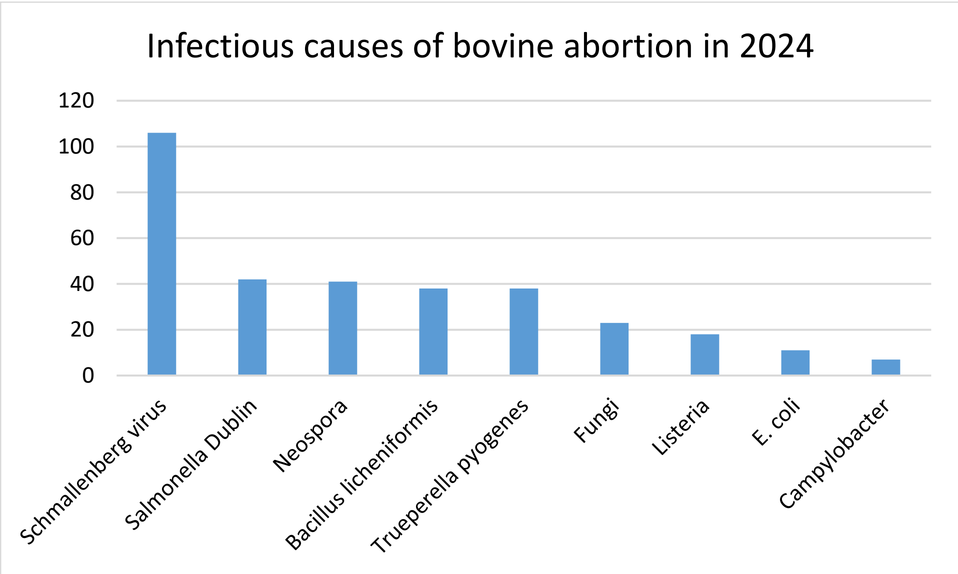
An important role of scanning surveillance is the detection of novel pathogens for different syndromes, including abortion in farm animals. Scanning surveillance also includes monitoring for new pathogens in cases of foetal abnormalities and congenital deformities. When new pathogens are detected, one of the main concerns is whether the new pathogen has zoonotic potential, in addition to welfare and economic concerns regarding the affected livestock.

Figure 1, data accessed 05 February 2025, includes the most frequently VIDA diagnosed causes of bovine abortion during 2024, with Schmallenberg virus (SBV) being the most commonly identified infectious cause. SBV was first detected in Germany in 2011 and was later detected in Great Britain in 2012. It is likely that the virus was introduced into England by infected wind-blown midges from Europe, and following this SBV infection was identified in deformed lambs and calves. SBV and Neospora are not zoonotic pathogens, whereas the other organisms can be opportunistic zoonotic pathogens.

Figure 1: bovine abortion VIDA data for Great Britain, January to December 2024

Table notes:

- Only the most commonly diagnosed infectious causes of bovine abortion are included



2025 update early lambing flocks and ovine abortions

Although lambing for some sheep flocks has been taking place since January 2025, most flocks lamb during spring. There have already been some ovine abortion submissions. Zoonotic advice is provided to submitting private veterinary surgeons by Veterinary Investigation Officers. Additional advice on the risks of infections that can be transmitted via contact between pregnant women and parturient / post-parturient animals is provided on the GOV.UK website: Pregnancy: advice on contact with animals that are giving birth. Public Health Wales have issued similar guidance: Advice issued to pregnant women during lambing season - Public Health Wales (nhs.wales)

2. Specific scanning and targeted surveillance and other studies

2.1 Campylobacter

Human campylobacteriosis is usually caused by the thermophilic *Campylobacter* species *C. jejuni* and *C. coli*, which can be found in a wide range of livestock, poultry and wildlife species. Poultry and poultry meat products are the main sources for human infection, and campylobacteriosis is the most commonly reported bacterial cause of food poisoning. The United Kingdom Food Security Report 2024 indicated that there were 71,710 laboratory-confirmed human infections in 2023, 66,327 in 2022, and 67,546 in 2021.

This Zoonoses and Veterinary Public Health report does not cover foodborne illness related to *Campylobacter* infection. However, non-thermophilic *Campylobacter* strains (such as *C. fetus*) can also, rarely, cause severe systemic illness in people. Only *Campylobacter* fetopathy numbers are detailed in table 1.

England and Wales

In 2024 there were a total of 84 *Campylobacter* isolates (10 in Quarter 4) identified by the APHA Starcross laboratory, which were mainly from ruminant abortions and comprised:

- Bovine – a total of 10 isolates: 3 *C. fetus venerealis intermedius*, 1 *C. fetus fetus*, 4 *C. jejuni*, and 2 *C. coli*. In Quarter 4 there were 2 *C. jejuni* and 1 *C. coli.*
- Ovine – a total of 74 isolates: 61 *C. fetus fetus*, 8 *C. jejuni*, 3 *C. coli*, and 2 *C. sputorum.* In Quarter 4 there were 3 *C. fetus fetus*, 3 *C. jejuni* and 1 *C. coli*.

Scotland

SRUC Veterinary Services had a total of 121 *Campylobacter* isolates during 2024 (13 in Quarter 4), which were:

- bovine – a total of 4 isolates: 2 *C. fetus venerealis intermedius*, 1 *C. jejuni*, and 1 non-typed *Campylobacter* sp.
- ovine – a total of 17 isolates: 16 *C. fetus* not-typed, and 1 non-typed *Campylobacter* sp.
- canine – a total of 91 isolates: 28 *C. upsaliensis,* 53 *C. jejuni,* 2 *C. coli,* 4 *C. lari*, and 4 non-typed *Campylobacter* sp. In Quarter 4 there were 3 *C. upsaliensis,* and 7 *C. jejuni.*
- feline – a total of 8 isolates: 3 *C. upsaliensis,* and 5 *C. jejuni.* In Quarter 4 there were 3 C. *jejuni.*
- zoo animals – 1 *C. coli* isolate from a chimpanzee.

2.2 Leptospirosis

Targeted surveillance by APHA for leptospirosis is variously achieved by analysis of results from:

1. Real-time polymerase chain reaction (RT-PCR) for pathogenic leptospires on appropriate diagnostic samples.

2. Microscopic agglutination test (MAT) antibody testing on sera submitted for disease diagnosis; or for monitoring and export (mainly dogs). Diagnostic MAT titres are considered seropositive at 1/100 or above (1/50 for *L.* Hardjo bovis in cattle).

3. Milk antibody testing by enzyme-linked immunosorbent assay (ELISA) of bulk tank samples submitted from dairy herds for monitoring purposes.

The last two methods are influenced by vaccination (dogs and cattle). MAT results are also very dependent on the range of serology (pools or single serovars) undertaken.

Kidney specimens examined by RT-PCR for pathogenic leptospires

Between January and December 2024, a total of 385 kidney specimens (kidneys from 52 cattle, 310 pigs, 8 sheep, 14 foxes and 1 dog) were submitted for testing by RT-PCR for pathogenic leptospires. There were 27 positive kidney test results, 21 from pigs and 6 from foxes. 19 of the submitted samples (16 porcine, 2 ovine and 1 bovine) were unsuitable for testing because they were too autolysed.

Serology for *Leptospira* serovars

During 2024, a total of 1,925 serum samples from a range of species were tested for *Leptospira* antibodies. Of these, 427 canine sera were tested for export purposes and 152 canine sera were tested for diagnostic purposes. There were 511 porcine samples which were tested for *L.* Bratislava, and 693 bovine samples were tested for *L.* Hardjo bovis.

Table 2: single *Leptospira* serovars tested in dogs, pigs, and cattle expressed as percentage positive for the number of samples tested for each serovar

Table notes:

- more than one serovar may be detected in a serum sample
- abbreviations used in this table:
    - Canine E. = canine export (dogs tested for export purposes)
    - Canine D. = canine diagnostic (dogs tested for diagnostic purposes)
- the total tested columns are the numbers of samples tested for each serovar
- % positive is the percentage of each tested serovar which gave a positive result, for example 17.6% of 427 canine export samples tested were positive for *L.* Canicola antibodies

Species	Serovar	Total tested: 2024	% positive	Total tested: 2023	% positive
Canine E.	*L.* Canicola	427	17.6	471	11.5
Canine E.	*L.* Icterohaemorrhagiae	47	0	53	9.4
Canine D.	*L.* Australis	31	58.1	44	86.4

Species	Serovar	Total tested: 2024	% positive	Total tested: 2023	% positive
Canine D.	*L.* Autumnalis	31	22.6	43	4.7
Canine D.	*L.* Bratislava	128	10.9	161	10.6
Canine D.	*L.* Canicola	137	19.7	148	26.4
Canine D.	*L.* Copenhagenii	144	35.4	153	36.0
Canine D.	*L.* Grippotyphosa	20	55	17	35.3
Canine D.	*L.* Icterohaemorrhagiae	141	7.1	155	10.3
Canine D.	*L.* Pomona	20	30	18	5.6
Canine D.	*L.* Sejroe	15	26.7	14	42.9
Porcine	*L.* Bratislava	511	12.3	511	24.1
Bovine	*L.* Hardjo bovis	693	12.1	1,041	5.5

In addition to single serovars, *Leptospira* pools (multiple serovars) are tested on a significant number of canine, porcine, and bovine samples. Pooled serovars are not included in the above data.

L. Hardjo bulk milk antibody tests

Between January and December 2024 there were 37 bulk milk *L.* Hardjo antibody tests for monitoring purposes, which gave the following results: 14 (37.8%) were negative, 5 (13.5%) were low positive, 3 (8.1%) were mid positive, and 15 (40.6%) were high positive.

For comparison, between January and December 2023 there were 32 bulk milk *L.* Hardjo antibody tests (for monitoring purposes), which gave the following results: 7 (21.9 %) were negative, 2 (6.3%) were low positive, 5 (15.6%) were mid positive, and 18 (56.2%) were high positive.

The significance of these observations is heavily influenced by vaccination status and selection, although it is thought unlikely that fully vaccinated herds contributed many samples. Low submission numbers also make comparisons across the two years difficult.

2.3 Mycobacteria (excluding bovine cases of *M. bovis*)

Since *Mycobacterium bovis* became notifiable in all species in 2006, the number of samples examined by APHA has increased, particularly from pets and camelids. Samples from pigs are mainly submitted by Official Veterinarians at abattoirs.

The APHA testing protocol changed in March 2022 whereby all new submissions from non-bovine animals have been tested by PCR, which detects the *M. tuberculosis* complex and *M. bovis*. If positive for the *M. tuberculosis* complex and *M. bovis*, the sample is sent for culture to establish the whole genome sequencing (WGS) clade of *M. bovis*.

If positive for the *M. tuberculosis* complex and negative for *M. bovis*, an unvalidated PCR for *M. microti* is carried out. If the PCR is positive for *M. microti*, culture is carried out and if the Mycobacterium grows in culture, the isolate is confirmed by WGS. If the PCR for *M. microti* is negative, culture is carried out to establish the Mycobacterium present (possibilities include other members of the *M. tuberculosis* complex such as *M. tuberculosis* or *M. caprae*).

This testing protocol means that we do not receive results for as wide a range of non-statutory *Mycobacterium* sp. as compared to the historic testing protocols. TB (*M. bovis*) in non-bovine animals' data is published in the TB in non-bovine species 2011 to 2024 dataset.

During 2024 samples from a range of non-bovine mammalian species were examined by APHA. This data was accessed on 06 February 2025 and may change as some cultures were still ongoing from Q4 2024:

- alpaca: 7 *M. bovis*, 4 *M. microti*
- llama: 1 *M. microti*
- deer: 78 *M. bovis*, 41 *M. tuberculosis* complex, 1 unclassified *Mycobacterium* sp.
- pig: 18 *M. bovis*, 2 *M. microti*, 1 *M. tuberculosis* complex, 1 unclassified *Mycobacterium* sp.
- sheep: 1 *M. bovis*
- cat: 8 *M. bovis*, 6 *M. microti,* 6 *M. tuberculosis* complex, 1 unclassified *Mycobacterium* sp.

During 2024 a total of 27 submissions (mammals are included in the above figures) had a VIDA-coded diagnosis of tuberculosis (Table 1). These were diagnostic submissions of animal carcases or tissue samples where suspicious lesions had been found on postmortem examination. These were from 1 pig submission, 14 bird submissions, 11 miscellaneous species submissions (2 alpaca, 5 deer and 4 domestic cats), and 1 wildlife (deer) submission.

The bird submissions comprised 5 chickens, 7 wild birds (2 owls, 2 swans, 1 goose, 1 golden eagle, 1 lapwing), 1 budgerigar, and 1 spoonbill. These were cases of avian tuberculosis, which is caused by infection with *M. avium* ssp. *avium.*

2.4 Q fever

PCR is used to confirm the presence of *Coxiella burnetii*, typically following the identification of suspicious acid-fast bodies in Modified Ziehl-Neelsen (MZN)-stained smears of placentae (or foetal samples). Confirmation of Q fever as a cause of fetopathy requires histopathology and immunohistochemistry of placental tissue, in addition to a positive PCR result. In each case when *C. burnetii* is detected by PCR, public health colleagues are informed of the incident and the zoonotic potential of this organism is highlighted to the farmer and private veterinary surgeon, with the provision of an advisory sheet about Q fever.

Comparisons of Q fever data with previous years should be made with caution because from April 2021 Q fever has been a reportable disease. Since 2023 there has been a notable increase in bovine test requests for the APHA *C. burnetii* PCR test. It is important to note that an increase in the detection of *C. burnetii* does not necessarily equate to an increased prevalence.

During 2024 a total of 132 samples were tested for the presence of *C. burnetii* by PCR. Of these, *C. burnetii* was detected in 50 samples which were one alpaca sample, 48 cattle samples and one sheep sample (Table 3). The *C. burnetii* PCR has been validated for placental and foetal fluid samples, although other samples are also tested on agreement with the customer.

Table 3: samples tested by PCR for the detection of *C. burnetii* during 2024

Table notes:

- Species tested comprised alpaca, cattle, goats and sheep
- Negative – *C. burnetii* was not detected; Positive – *C. burnetii* was detected
- There were several samples submitted for some of the farms, some within one submission, and some within several submissions
- Sample types included placenta, foetal fluid, foetal tissues, and maternal swabs which were mainly vaginal swabs

Species	**Samples tested**	**Negative**	**Positive**	**Positive Submissions**	**Positive farms**	Placenta positive	Foetal fluid positive	Foetal tissue positive	Swab positive
Alpaca	6	5	1	1	1	1	-	-	-
Cattle	111	63	48	37	27	21	5	2	20
Goat	2	2	0	0	0	-	-	-	-
Sheep	13	12	1	1	1	1	-	-	-

Of the 27 positive cattle farms, 21 farms were in England, three farms were in Wales and three farms were in Scotland. Most of the positive cattle farms were dairy farms.

In addition, during 2024 the detection of *C. burnetii* in 59 bovine bulk milk samples by PCR at an overseas laboratory (48 from English dairy farms, 6 from Welsh dairy farms, and 5 from Scottish dairy farms) were reported to APHA.

2.5 *Streptococcus suis*

Streptococcus suis isolates from diagnostic material submitted to APHA and SRUC Veterinary Investigation Centres are typed further for disease surveillance purposes. The submission numbers and serotypes from porcine diagnostic material submitted during 2024 are shown below, with data for the previous 2 years (2023 and 2022) for comparison.

Table 4: *Streptococcus suis* serotypes from porcine diagnostic material

Table notes:

- UT = untypeable
- 1/2 = is a recognised distinct serotype which reacts with both 1 and 2 antisera
- brackets indicates the serotype

	1/2	1	2	3	4	5	6	7	8	9, 10	11, 12	13, 14	19, 21	23, 25	29, 34	UT	Total
2022	-	15	36	5	2	1	-	11	1	3 (9)	-	4 (14)	-	-	-	13	**91**
2023	1	7	36	5	5	-	2	10	2	-	-	3 (13) 3 (14)	1 (19)	-	2 (34)	9	**86**
2024	4	11	30	1	1	3	-	11	3	2 (9) 1 (10)	1 (11) 1 (12)	1 (13) 5 (14)	1 (19) 1 (21)	1 (23) 1 (25)	1 (29)	17	**97**

Serotype 2 was the most common serotype for all three years, 2022, 2023 and 2024. The second most common serotype was 1 in 2022, 7 in 2023, and both 1 and 7 in 2024.

2.6 Toxoplasmosis

The European Food Safety Authority (EFSA Journal 2007, 583, 1 to 64) highlighted the significance of toxoplasmosis as a foodborne zoonosis and the need to improve surveillance in this field. Serological examinations for *Toxoplasma gondii* using the latex agglutination test (LAT) are undertaken by APHA on sera submitted to Veterinary Investigation Centres. The findings presented below provide a summary of the serological status of samples submitted for diagnosis, monitoring and screening purposes during 2024, but do not constitute a structured survey. Positive samples, as defined here, have LAT titres of 1/64 or greater and indicate a history of exposure to this protozoan parasite. Toxoplasmosis as a cause of fetopathy in sheep and goats is diagnosed through antigen (PCR) testing of placental cotyledon.

During 2024, 72 ovine samples and 5 caprine samples were submitted for Toxoplasma serology. There were 41 positive titres: 40 sheep and one goat. Toxoplasma fetopathy figures for sheep and goats are provided in Table 1.

3. Investigations into zoonotic and potentially zoonotic incidents

Protocols for the investigation of zoonotic disease incidents in England and Wales are set out in the Guidelines for the Investigation of Zoonotic Disease (England and Wales).

There is similar guidance on the investigation and management of zoonotic disease in Scotland.

Advice for members of the public planning a trip to animal-associated visitor attractions, and other information, can be found on the UK Health Security Agency (UKHSA) zoonotic disease webpage.

The Industry Code of Practice for preventing or controlling ill health from animal contact at visitor attractions is available on the National Farm Attractions Network website.

The APHA-assisted investigations described within sections 3.1 Cryptosporidiosis, 3.2 STEC (Shiga toxin-producing *Escherichia coli*) and 3.3 *Corynebacterium ulcerans* cover England and Wales.

3.1 Cryptosporidiosis

Investigations to assist in human outbreaks of cryptosporidiosis linked to direct contact with animals are undertaken at the request of Consultants in Communicable Disease Control (CsCDC) of the UKHSA and Public Health Wales (PHW) and in collaboration with the National Cryptosporidium Reference Unit, Swansea, and follow jointly agreed guidelines. Consultants in Public Health Medicine (CsPHM) lead on these zoonoses investigations in Scotland.

Quarter 2 (Q2) is traditionally the busiest time for cryptosporidiosis investigations and is related to the frequency of open farm visits undertaken by families or school groups around the Easter holiday and bank holidays. Contact with young lambs either through bottle-feeding or handling is a high-risk activity for the zoonotic spread of *Cryptosporidium parvum* in these settings. The availability and accessibility of appropriate and suitably located hand-washing facilities including soap, rather than antimicrobial gel (which is not effective for this pathogen) is extremely important. During the investigation of cryptosporidiosis human outbreaks APHA provides comprehensive veterinary advice including advice on identified deficiencies to assist farm businesses to comply with the Industry Code of Practice for preventing or controlling ill health from animal contact at visitor attractions.

2024 investigations summary

During 2024 APHA assisted with 13 cryptosporidiosis investigations, 12 during Q2 and one during Q4 (which was a premises that was investigated in Q2). Two of the Q2 investigations involved both Cryptosporidiosis and STEC human cases.

During 2024, some farm visitor attractions were offering cuddling of young lambs and piglets to visitors. This involves close contact, with potential for clothing and footwear contamination. Activities like these increase the risk of transmission of a range of zoonotic organisms, including Shiga toxin-producing *Escherichia coli*.

3.2 STEC

Shiga toxin-producing *Escherichia coli* (STEC, formerly known as VTEC) outbreak investigations are undertaken, according to agreed guidelines, at the request of CsCDC of UKHSA and PHW (CsPHM in Scotland) where an animal-associated source is suspected. These investigations often also involve collaboration with other organisations, including the environmental health departments of local authorities and the Health and Safety Executive (HSE). Determination of virulence factors, including shiga toxin genes and comparison of human and animal isolates by whole genome sequence (WGS) analysis, are performed by the Gastrointestinal Bacteria Reference Unit (GBRU), UKHSA Colindale. If isolates from animals circumstantially implicated in outbreaks have an indistinguishable WGS profile to those from human cases, this is taken as confirmatory evidence of the epidemiological link. Other STECs or WGS types may be detected incidentally during the investigation of animal premises.

2024 investigations summary

During 2024 APHA assisted with seven STEC investigations, two during Q1, two during Q2, and three during Q3. These comprised three STEC O26 and two STEC O157 investigations that were epidemiologically linked to open farms; and two STEC O145 investigations that were epidemiologically linked to high-risk foods. Further information is available in the zoonoses and veterinary public health quarterly reports.

It is recommended that all open-farm attractions (and other venues where close or direct contact by members of the public with animals is anticipated) are fully compliant with the Industry Code of Practice. The most frequently identified deficiencies at animal contact visitor attractions (including open farms) include suboptimal handwashing facilities (number, accessibility, appropriateness); suboptimal supervision of animal contact; contamination of walkways with soiled animal bedding or faeces; and unclear demarcation of animal contact versus non-contact areas.

For STEC outbreaks that are epidemiologically linked to milk and milk products it is advisable that the farmer ensures milking routines and dairy hygiene are optimised. Unpasteurised milk can be a potential source of a range of other zoonotic micro-organisms in addition to STECs - thus optimised dairy routines and hygiene in the handling of milk including all equipment and bottles are exceedingly important.

3.3 *Corynebacterium ulcerans*

Corynebacterium ulcerans was first isolated from cases of throat infection in humans in 1926, with zoonotic outbreaks initially associated with direct contact with farm animals or consumption of unpasteurised milk. More recently zoonotic incidents have been associated with contact with companion animals such as dogs and cats. *C. ulcerans* can be asymptomatically carried in the throat of some dogs and cats. *C. ulcerans* has also been isolated from skin lesions, nasal discharge, and other anatomical sites of clinically unwell dogs and cats. The organism can produce diphtheria toxin, which can cause human disease with the same clinical signs as cutaneous or respiratory diphtheria caused by *C. diphtheriae*.

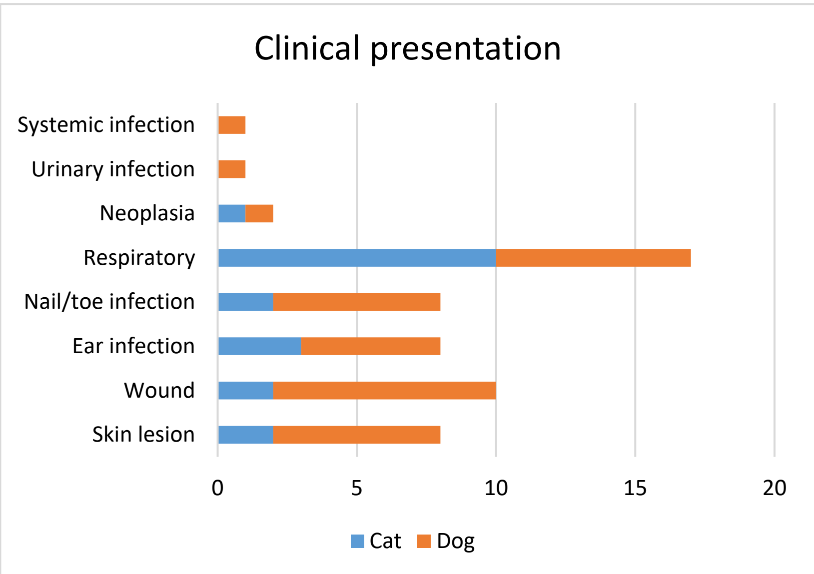
APHA and SRUC Veterinary Services in Scotland assist public health colleagues in the investigation of human index cases of *C. ulcerans* where there has been animal contact. Similarly; for animal index cases, APHA/SRUC vets will support the private veterinary surgeon and provide animal related advice. Check the guidance for [public health management of toxigenic *C. ulcerans* in companion animals.]

Toxigenic *C. ulcerans* investigations are multidisciplinary and APHA works closely with public health colleagues to investigate, manage, and provide advice regarding the animals involved. Typically, APHA will also liaise closely with the private veterinary surgeon to facilitate the taking of and testing of swabs, antibiotic treatment, and post-treatment clearance swabs as appropriate. APHA also provides advice on health and safety procedures for private veterinary surgeons and pet owners, including information on cleaning of pet bedding and pet toys. For animal index cases comprehensive information is available in the companion animal public health guidance (see above link).

2024 investigations summary

During 2024 APHA assisted with 55 pet index cases involving cats and dogs, one baboon index case, one cow index case, one horse index case, and seven human index cases. There was also an equine case of *C. diphtheriae*. The pet index cases comprised 20 feline index cases and 35 canine index cases. The clinical presentation of the pet index cases is illustrated in figure 2.

Figure 2: clinical presentations of cat and dog animal index cases of toxigenic *C. ulcerans* during 2024



The commonest presentation for cats was upper respiratory tract infection (10 out of 20). For dogs infected wounds (8 out of 35), upper respiratory tract infection (7 out of 35), skin lesions (6 out of 35) and nail or toe infections (6 out of 35) were common presentations.

APHA recommends surveillance swabbing of pet cats and dogs which have had close contact with an animal index case, for example being in the same household, to investigate if there has been any animal-to-animal transmission. Similarly, swabbing of pet cats and dogs that are in close contact with a human index case is recommended. Table 5 provides data on swabbed contact pets including where one or more contact pet has tested positive. Some pet index cases had no contact pets. The table also included human index cases who had close contact with cats or dogs.

Table 5: animal and human index cases of toxigenic *C. ulcerans* during 2024

Index case refers to animal index cases (cat or dog) and human index case.

Index case	Number of index cases	Number of index cases with contact pets	Number of index cases with swabbed contact pets	Index cases with one positive contact pet	Index cases with > 1 positive contact pet
Cat	20	14	10	1	0
Dog	35	25	14	2	2
Human	7	7	3	1	0

Six of the cat index cases and ten of the dog index cases had no close contact with other pets. Surveillance swabbing of the contact pets was not done in all cases, with reasons including the contact pets were already on antibiotics.

One contact cat of an index cat and two contact dogs (one dog for two separate canine index cases) were found to be asymptomatically infected with toxigenic *C. ulcerans*. In addition, a multidog household presented twice during 2024 having two different index dogs on each occasion. For both index dogs in this household, there were two positive contact dogs.

Although there were seven human index cases with pets, only three chose to test the contact pets, which resulted in the detection of toxigenic *C. ulcerans* in one cat.

3.4 Q fever *(Coxiella burnetii)*

In each case when *C. burnetii* is detected by PCR, public health colleagues are informed of the incident and the zoonotic potential of this organism is highlighted to the farmer and private veterinary surgeon, with the provision of an advisory sheet about Q fever.

For all ruminant abortion investigations and reports of the detection of *C. burnetii*, APHA provides comprehensive advice to private veterinary surgeons, including information about optimising ruminant abortion investigations, laboratory testing, and zoonoses advice for private vets to pass on to their farmer clients.

Transmission of *C. burnetii* to humans is most frequently due to inhalation of contaminated aerosols or contaminated dusts. Aerosolized bacteria are spread in the environment by infected animals after normal births or abortion. Birth products contain the highest concentration of bacteria, but *C. burnetii* is also found in urine, faeces and milk of infected animals.

2024 investigations summary

During 2024 there were 37 bovine submissions (from 27 farms) were *C. burnetii* was detected by PCR (table 3) and only three bovine submissions where there was a diagnosis of *C. burnetii* abortion (table 1). In addition to bovine cases, *C. burnetii* was also detected in one alpaca, and one sheep (table 3). APHA provided advice during one Incident Management Team meeting regarding a dairy farm that was selling unpasteurised milk. In 2024 there were no human outbreaks of Q fever that were epidemiologically linked to farms.

The positive sheep sample was from a lowland ewe which had aborted triplet foetuses one month prior to her due date. Molecular testing of the submitted placenta resulted in the detection of both *Chlamydia abortus* (the cause of ovine enzootic abortion) and *C. burnetii* by PCR. The PCR result for *C. abortus* was consistent with *C. abortus* being the cause of abortion, whereas the PCR result for *C. burnetii* was indicative of a very low number of organisms, thus detection may have been an incidental finding, but important from the zoonotic perspective. There were no suitable tissues for histopathological examination.

3.5 Avian chlamydiosis (psittacosis)

Chlamydia psittaci, the causative agent of avian chlamydiosis (psittacosis), can cause serious human illness. The disease has been described in many species of birds, particularly in parrots, parakeets, budgerigars, and cockatiels. Other commonly affected birds include pigeons and doves. Ducks and turkeys may also be affected, but chickens less frequently. Birds can asymptomatically carry the organism without any signs of disease, or they can become mildly to severely ill.

C. psittaci can lead to inapparent subclinical infection or acute, subacute, or chronic disease, characterised by respiratory, digestive, or systemic infection. The clinical signs are generally non-specific and vary greatly in severity, depending on the species and age of the bird and the *Chlamydia* strain involved. Humans are most likely to contract *C. psittaci* infection through inhalation of dust or aerosols contaminated by secretions from infected birds for example faeces, ocular and respiratory secretions. It is therefore important to follow current health and safety measures when in contact with birds. Further information on psittacosis infection is available online at: Psittacosis - UKHSA guidance and Psittacosis - HSE factsheet.

2024 investigations summary

The detection of *C. psittaci* in psittacine birds is statutorily reportable to APHA. During 2024 there were four reports of the detection of *C. psittaci* in psittacine birds, two in Q2, one in Q3 and one in Q4. Further information is available in the Zoonoses and veterinary public health: disease surveillance reports - GOV.UK

4. *Brucella canis*

Since July 2020, there has been a large increase in the number of incidents of canine brucellosis due to infection with *Brucella canis.* APHA, in liaison with health protection agencies across Great Britain, has been involved in investigating these incidents. The UK Chief Veterinary Officer advised on this potential zoonotic disease in a letter published in the Vet Record in February 2021. Amendments to the Zoonoses Order in 2021 added dogs to the list of animals for which brucellosis is a reportable disease in Great Britain.

Further information is available in APHA's Canine-Brucellosis-Summary.pdf and in our list of Frequently asked Brucella canis testing questions - GOV.UK

General information for the public and dog owners is available on the GOV.UK website.

The Human Animal Infections and Risk Surveillance group (HAIRS) Brucella canis risk assessment outlines the current risk to the UK human population from canine brucellosis.

The British Small Animal Veterinary Association (BSAVA) have published a scientific document on *Brucella canis*

2024 Investigations summary

During 2024, there were 333 epidemiologically separate incidents where there was strong evidence of infection with *B. canis*. All 333 were identified by serology, and presented at least one other risk factor for *B. canis* infection, and were reported to the relevant public health authorities. All incidents identified involved the testing of a single dog, although this may be subject to change if further information about significant contacts becomes available.

As more information about the incidents in 2024 became available, the *B. canis* data was updated, with the revised figures as follows:

- Q1 – 77 incidents
- Q2 – 69 incidents
- Q3 – 83 incidents
- Q4 – 104 incidents.

Investigation into an incident that commenced in the first quarter of this year, involving a dog breeder, is continuing with the cooperation and joint management of several different government departments.

In addition to providing information about *B. canis*, APHA's guidance on imported disease summaries for dogs and cats provides a short summary of some other diseases that could be imported into the UK with the importation of dogs and cats. This list is not exhaustive but provides a useful summary and signposts to further information for some conditions of concern.