Animal &
Plant Health
Agency

Zoonoses and Veterinary Public Health

Quarterly report Q2 – April to June 2022

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

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 FZ2100 project reports, which primarily relate to farmed animal species, summarise the surveillance activities of the Animal and Plant Health Agency (APHA) and the SRUC Veterinary Services in Scotland, for zoonoses and infections shared between man and animals in Great Britain, using data gathered by the network of Veterinary Investigation Centres. Quantitative diagnostic data for all of GB is provided by the Veterinary Investigation Diagnostic Analysis (VIDA) surveillance system. Summaries of joint veterinary/medical investigations into incidents and outbreaks of zoonotic disease and associated activities are also included. This report covers the three month period between April and June 2022.

The Zoonoses and Veterinary Public Health project (FZ2100) is funded by Defra, the Scottish Government and the Welsh Government through the APHA's Bacterial Diseases and Food Safety portfolio and also uses returns from scanning surveillance projects. 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 certain animal species, e.g. brucellosis or TB. Information concerning notifiable or reportable zoonoses is recorded elsewhere, some under specific projects such as FZ2000 (*Salmonella*). *Coxiella burnetii* (Q fever) was made reportable under the Zoonoses Order in 2021 and is included in this report.

1. General scanning surveillance

1.1 Non-statutory Zoonoses VIDA data for Great Britain: April - June 2022

This table (collated 8th August 2022) summarises clinical diagnoses of non-statutory zoonoses and infections shared between animals and humans from specimens submitted to APHA and SRUC veterinary investigation centres between April and June 2022 and compares the findings with the same quarter (Q2) in 2020 and 2021. It includes rare zoonotic infections and those for which zoonotic potential is confined predominantly to immuno-compromised individuals. Diagnoses use strict criteria and are recorded (once only per incident) using the Veterinary Investigation Diagnostic Analysis (VIDA) system. The list is subject to selection, submission and testing bias. It is not definitive and excludes notifiable or reportable diseases (notably salmonellosis, which is recorded elsewhere). 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 GB.

1. General scanning surveillance: non-statutory zoonotic VIDA data for Great Britain April - June 2022 – all species

VIDA codes	Diagnosis	2020	2021	2022	Cattle	Sheep	Goats	Pigs	Birds [1]	Misc	Wildlife [2]
311	Babesiasis	3	11	11	11						
258 & 659	Brachyspira pilosicoli /intestinal spirochaetosis	12	13	13				13	0		
013	Campylobacter fetopathy	6	9	6	1	5	0			0	0
282	Chlamydiosis (C. psittaci)	0	0	1					1		
014	Chlamydia abortus fetopathy	21	29	28	0	27	1			0	0
732	Corynebacterium pseudotuberculosis (CLA)	6	3	9		9	0				
318	Cryptosporidiosis	99	113	68	57	9	1	0	0	0	1
362	Cysticercosis	0	1	0		0					
193	Dermatophilus infection	1	0	0	0	0	0		0	0	
022, 133 & 615	Erysipelas	3	2	5		1	0	3	1	0	
371, 372 & 373	Fasciolosis	30	61	31	21	7	1			1	1
363	Hydatidosis	0	0	0		0					
015, 136 & 139	Leptospirosis (all categories)	1	0	1	0	0	0	0		0	1
016, 140, 150, 189 & 711	Listeriosis (all categories)	28	54	26	12	10	4	0	0	0	0

VIDA codes	Diagnosis	2020	2021	2022	Cattle	Sheep	Goats	Pigs	Birds [1]	Misc	Wildlife [2]
217	Louping ill	3	7	13	2	10			1		
225	Orf (parapox virus)	4	10	6		6	0			0	
152,153, 157, 158	Pasteurella multocida pneumonia /pasteurellosis	58	67	38	20	13	0	5	0	0	0
223	Pseudocowpox (parapox virus)	0	0	0	0						
027 & 262	Q Fever/Coxiella burnetii	0	1	0	0	0	0			0	0
374	Red Mite (Dermanyssus gallinae)	0	3	0					0		
195	Ringworm	0	0	0	0	0	0	0	0	0	0
379, & 392	Sarcoptes scabei infection	1	1	0	0		0	0		0	
024, 171, 172 & 644	Streptococcal infection (excluding bovine mastitis)	45	55	24		5	0	18	1	0	0
745	Swine influenza	9	24	6				6			
026 & 315	Toxoplasmosis (incl. fetopathy)	26	21	24		23	1			0	0
142	Tuberculosis (excl. M. bovis)	3	6	2			0	0	1	0	1
034 & 154	Yersiniasis (incl. fetopathy)	1	4	3		2	1	0	0	0	0

NR – Not recorded Shaded boxes indicate a diagnosis is not available for that species

[1] Includes both domestic and wild birds [2] Mammals only

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.

More detailed specific information on scanning surveillance diagnoses and trends for endemic diseases is available from:

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

1.2 Highlights from APHA and SRUC disease surveillance centres

This section provides a summary of the main items of zoonotic interest from material submitted to the APHA (England and Wales) and SRUC Veterinary Services (Scotland) between April and June 2022.

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:

APHA Scanning surveillance reports

Quarter 2 in 2022 had lower numbers of cattle, sheep, pig and avian diagnostic submissions made to APHA and SRUC surveillance centres when compared with diagnostic submissions for the same species for Q2 of 2021. Goat diagnostic submissions were comparable to Q2 2021, whereas for the other livestock species submission numbers were lower for each species. For cattle, diagnostic submission numbers were higher than the other species, but 20% lower than Q2 2021. The sheep diagnostic submissions were 11% lower than Q2 2021; pig diagnostic submissions were 35% lower than Q2 2021; and avian diagnostic submissions were 15% lower than Q2 2021.

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 in the UK, with over 65,000 cases reported in 2018. This report does not cover food-borne illness related to *Campylobacter* infection.

However, non-thermophilic *Campylobacter* strains (such as *C. fetus*) can also (rarely) cause severe systemic illness in people.

Please note that only *Campylobacter* fetopathy numbers are detailed in Table 1 above.

England & Wales

Only three *Campylobacter* isolates (from ruminant abortion cases in England and Wales) were identified by the APHA Starcross laboratory during the period April to June 2022; the one cattle submission was identified as *C. jejuni.* The two ovine isolates were both *C. fetus fetus*.

Scotland

SRUC Veterinary Services had a total of 78 Campylobacter isolates during the period April to June 2022, which were:

Bovine – There was one bovine Campylobacter isolate which was C. jejuni.

Ovine – There were six ovine Campylobacter isolates which comprised three C. fetus (not typed) and three C. jejuni.

Canine – There were 71 canine Campylobacter isolates which comprised 58 C. upsaliensis, 12 C. jejuni, one non-typed Campylobacter sp.

2.2 Leptospirosis

Targeted surveillance by APHA for leptospirosis is variously achieved by analysis of results from: (1) RT-PCR for pathogenic leptospires on appropriate diagnostic samples, sequencing and denaturing high pressure liquid chromatography (DHPLC); (2) Microscopic agglutination test (MAT) antibody testing on sera submitted for disease diagnosis, monitoring and export (mainly dogs). Diagnostic MAT titres are considered seropositive at 1/100 or above (1/50 for *L.* Hardjo bovis in cattle) and; (3) Bulk milk tank antibody testing (by ELISA) of samples submitted from dairy herds for monitoring purposes. The latter 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.

1. Between April and June 2022, a total of 45 kidney specimens (kidneys from 20 cattle, 1 sheep, 21 pigs, 3 foxes) were examined by real-time PCR for pathogenic leptospires with positive kidney test results from the three fox samples only. 12 of the samples submitted were unsuitable for testing.

2. Between April and June 2022, a total of 411 serum samples from a range of species were examined. Of 132 canine sera examined for *L.* Canicola and 6 for *L.* Icterohaemorrhagiae for export purposes, 5.3% and 0% were positive respectively,

compared to 5% and 0% for the same quarter last year. Of 40 canine sera tested for diagnostic purposes, 20% were positive for *L.* Canicola (18.3% in Q2 2021), 46.2% for *L.* Copenhageni (18.3% in Q2 2021), 19.4% for *L.* Icterohaemorrhagiae (8.6% in Q2 2021), 17.5% for *L.* Bratislava (10.9% in Q2 2021), 11.1% for *L.* Pomona (2.7% in Q2 2021), 40% for *L.* Grippotyphosa (8.1% in Q2 2021), 71.4% for *L.* Australis (50% in Q2 2021), 7.1% for *L.* Autumnalis (0% in Q2 2021) and 66.7% for *L.* Sejroe (0% in Q2 2021); of 185 bovine samples examined for *L.* Hardjo bovis, 7.6% were positive (13.3% in Q2 2021); from 17 samples received, there were 0% positive porcine samples tested for *L.* Bratislava (35.9% in Q2 2021).

3. Between April and June 2022 (Q2 2022) two (15.5%) of 13 bulk milk *L.* Hardjo antibody tests undertaken for monitoring purposes were negative, two (15.5%) were low positive, and nine (69%) were high positive. Between April and June 2021, six (55%) of 11 bulk milk *L.* Hardjo antibody tests undertaken for monitoring purposes were negative, two (18%) were low positive, and three (27%) 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 quarters difficult.

2.3 Mycobacteria (excluding *M. bovis*)

Since *Mycobacterium bovis* became notifiable in all species in 2006, the number of samples examined by APHA Weybridge has increased, particularly from pets and camelids. Samples from pigs are mainly submitted by meat inspectors. A summary of potentially zoonotic non-statutory mycobacteria identified during the calendar year will be provided in the annual (Q4) report.

2.4 Q fever

Diagnosis of Q fever is undertaken using PCR to confirm the presence of *Coxiella burnetii*, typically following the identification of suspicious acid-fast bodies in MZN stained smears of fetal tissues. 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 where a clinical diagnosis is made, 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:

Q fever: Information for farmers

Nine samples, four of placental tissue and five of foetal fluid, were submitted from five cows, two sheep, one goat and one alpaca for *Coxiella burnetii* PCR testing with one positive bovine result. Further information about this bovine submission is provided in section 3.4.

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 numbers and serotypes from porcine diagnostic material submitted during the period April to June 2022 are shown below, with data for the same quarter in previous years for comparison. UT = untypeable

Year (Q2)	1	2	3	4	5	7	8	9	10	13	14	15	21	28	29	31	34	UT	Total
2020	3	15	1		2	8	3	3		1	3	3	1	1	1			4	**49**
2021	3	11	3	2		5	1	3	1	1	4						1	3	**38**
2022	6	8		1		2	1												**18**

The above table shows that compared to the previous two years Q2 2022 had lower numbers of submissions where *Streptococcus suis* was detected in pigs and in Q2 2022 there was also less spread across serotypes. For Q2 for each year serotype 2 predominated.

2.6 Toxoplasmosis

The European Food Safety Authority (EFSA Journal 2007, 583, 1-64) 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 the APHA on sera submitted to VICs. The findings presented below provide a summary of the serological status of samples submitted for diagnosis, monitoring and screening purposes during the period April to June 2022, 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 may also be diagnosed through antigen (PCR) testing of placental tissue, and in sheep through IFAT testing of foetal blood or body fluid.

In sheep, 13 individual blood samples from two submissions were tested of which six were positive for antibodies to *T. gondii.* In goats, samples from seven individual animals from two different holdings were tested with two positive results.

Toxoplasmosis as a cause of small ruminant abortion was confirmed on 24 occasions, in 23 sheep submissions and in one goat submission.

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 following document:

Guidelines for the Investigation of Zoonotic Disease (England and Wales)

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

Guidelines on the roles and responsibilities of agencies involved in 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 PHE Zoonoses Webpages.

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 UKHSA/PHW (CsPHM in Scotland) and in collaboration with the National Cryptosporidium Reference Unit, Swansea, and follow jointly agreed guidelines.

During Q2 2022 APHA assisted with one human Cryptosporidiosis outbreak in England and two in Wales:

APHA were contacted by the UKHSA East of England to join an Incident Management Team (IMT) meeting in mid-April 2022 to discuss a human outbreak of Cryptosporidiosis affecting initially four individuals with a link to an open/petting farm. One of the four individuals had a concurrent STEC infection and two had been hospitalised, including the dual infection case. A visit to the farm by Environmental Health Officers identified a number of issues which increased the risk of exposure to Cryptosporidium such as poor hand washing facilities, direct contact while feeding pet lambs and goats and poor understanding/compliance with the Code of Practice for such farms. The owners closed the petting part of the farm enterprise following the initial investigation findings whilst the on-site shop remained open.

As part of a new initiative to maximise our ability to detect cryptosporidia in potential contact animals and hence match the results to the human cases, pre-emptive faeces samples were collected by an Environmental Health Officer from 15 different animal group areas on the farm and these were submitted to APHA Starcross for Cryptosporidium FAT testing at APHA Carmarthen. The faeces were submitted initially to APHA Starcross because of the potential risk of the faeces also harbouring STEC and cultures for *E. coli*

O157 were initiated in the Category 3 facility at APHA Starcross as well as smears being prepared for Cryptosporidium screening.

By late April 2022 it was confirmed that there were 23 separate cases of gastroenteritis illness with 20 of these cases associated with visiting the farm in question, and all cases had petted at least one animal species (goats, sheep, cattle) on the farm. By early May it was confirmed that there were 26 ill individuals, with questionnaires completed for 24 individuals all indicating a visit to the farm in question and petting of animals on site. Two cases had joint STEC O26 and Cryptosporidium infection. All 15 collected animal faeces samples were negative by culture for O157, which is an important lesson learned as the STEC was later confirmed as O26 which appears to be of increasing incidence. Negative test results can occur because of the time lag between human cases being exposed and the later animal investigations. Intermittent excretion from animals can also influence the test results. Despite our pre-emptive sampling all 15 samples were also negative for Cryptosporidium by FAT testing making a definitive epidemiological link to the human cases and the farm visits difficult.

APHA contributed to the investigation and control of two Cryptosporidium outbreaks in Wales. One remained as an IMT, in mid Wales, with three confirmed cases which visited the implicated open farm attraction within the incubation period of their illness. On farm investigations and inspections identified areas for improvement, and action was taken by the operators under the guidance of the Local Authority (LA).

The other was escalated to an Outbreak Control Team (OCT), with a total of 10 human cases which visited the implicated open farm attraction in North Wales within the incubation period of their illness. A further case was identified as having the same outbreak strain of Cryptosporidium but did not have sufficient epidemiological links to the premises to be included in the outbreak. APHA contributed to the OCT and a Veterinary Investigation Officer visited the premises with LA colleagues. Several risk areas and high risk activities were identified. Recommendations have been taken on board and the OCT was content that improvements were appropriate. The LA have instigated a regular programme of unannounced visits to ensure compliance with recommendations.

3.2 STEC

Shiga toxin-producing *E. coli* (STEC, formerly known as VTEC) outbreak investigations are undertaken, according to agreed guidelines, at the request of CsCDC of UKHSA/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. Determination of phage type (PT), shiga toxin (ST) type, and comparison of human and animal isolates by whole genome sequencing (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 a causal

association. Other STEC (VTEC) PTs or WGS types may be detected incidentally during the investigation of animal premises.

During Q2 2022 APHA assisted the UKHSA East of England with a joint Cryptosporidiosis / STEC O26 human outbreak as described above under the Cryptosporidiosis section on pages 8-9. All 15 collected animal faeces samples were negative by culture for STEC O157, the STEC were later confirmed as O26 which appears to be of increasing incidence.

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. The organism can produce diphtheria toxin which is capable of producing human disease with the same clinical signs as cutaneous or respiratory diphtheria caused by *C. diphtheriae*. More recently, *C. ulcerans* has been isolated from the oral cavity of domestic pets such as dogs and cats, and current zoonotic outbreaks are investigated by APHA and SRUC Veterinary Services in Scotland by throat swabbing of in-contact companion animals.

Two incidents of *Corynebacterium ulcerans* infection were recorded in this Quarter (four incidents recorded in Quarter 1, 2022), with one having a human index case and the other a cat as the index source. In the former case *C. ulcerans* was isolated from a skin lesion swab taken from a hand of an adult male. Two dogs regularly visited the household (with family members). Swabs were taken from in-contact family members with negative results. The two dogs had throat swabs taken by a private veterinary surgeon and these swabs were submitted to APHA Starcross for culturing. *C. ulcerans* was isolated from one of the two dogs and this isolate was confirmed as toxigenic by the UKHSA Colindale laboratory. In these cases the advice given by APHA is to treat both dogs for a 14 day period with antibiotic due to sharing of food bowls and bedding. Clearance swabs taken from both dogs after the end of the antibiotic treatment course were negative for the presence of *C. ulcerans.*

In the second case toxigenic *C. ulcerans* was isolated from a nasal swab taken from a cat with chronic rhinitis and potentially further bony changes within the nasal cavity. The household contained four cats and two dogs in addition to the cat in question. One cat and one dog were throat swabbed by a private veterinary surgeon and both had *C. ulcerans* isolates but on this occasion both isolates were non-toxigenic when tested by UKHSA Colindale. Again all of the household pets were treated for a 14 day period with antibiotic and clearance swabs were negative, apart from the index case cat which is to date on a six week course of antibiotics with further clearance swabs planned. None of the human in-contacts were positive for *C. ulcerans* by swabbing.

3.4 Q fever *(Coxiella burnetii)*

Comparisons of Q-fever data in quarter 2 of previous years should be made with caution because from April 2021 Q fever has been a Reportable disease. This means that there is likely to have been increased surveillance for Q fever following April 2021.

As stated in section 2.4 there was one Q fever PCR positive submission which comprised a placental sample submitted from a private laboratory in May to APHA Penrith to test for *Coxiella burnetii* by PCR. The PCR gave a positive result. The placental sample was from an aborted dairy cow from a farm in South West England. There had been three recent abortions in the herd of approximately 300 cows. It was reported that some abortion investigations had been performed by the private laboratory and the cause of abortion had not been determined, however we are unable to comment further because the full extent of the investigations is unknown. For this submission we did not receive any fixed placenta to perform histopathological examination to determine if there was any placentitis due to infection with *C. burnetii*. The zoonotic potential of *C. burnetii* was highlighted, with the provision of a link to the Q fever advisory information leaflet, which was forwarded to the submitting laboratory with a request to pass the information on to the farm's private veterinary surgeon and to the farmer. A second submission, in May, from the same farm which comprised a foetal fluid sample from another aborted cow in the herd gave a negative Q fever PCR result. There were no reports of human illness.

3.5 Avian chlamydiosis (psittacosis)

A seven-month-old Blue-Fronted Amazon parrot was submitted to APHA Starcross for post-mortem examination. This bird had been purchased from a pet shop in early May 2022, having been imported from the Czech Republic and is believed to have arrived at the pet shop as part of a consignment of over 40 parrots. Since purchase the bird had been kept in a cage in the owner's house. It had appeared listless and had been anorexic since arrival, with green coloured liquid droppings also noted. It was found dead approximately 10 days from the purchase date. This was the only parrot currently in the household. Post-mortem examination identified liquid intestinal content together with severe pneumonia. Subsequent PCR testing of spleen and faeces from the carcase gave a positive result from both samples for the presence of *Chlamydia psittaci*. The UKHSA were notified through the use of an Outbreak Investigation Report issued by Project FZ2100 and as Avian chlamydiosis (in psittacines only) was made reportable in April 2021 an Immediate Report form was completed, and the case added to our reportable disease database.

Advice was given on the use of PPE (mask, gloves, overalls if possible) when cleaning the cage of this bird using a suitable disinfectant for this organism, and the owners were advised to contact their GP if anyone in the household developed flu-like symptoms.