



Animal &
Plant Health
Agency

Zoonoses and Veterinary Public Health

Quarterly report Q1 – January to March 2018

Project FZ2100

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Monitoring the field occurrence of appropriate animal diseases can highlight the potential for zoonotic transmission and provide a sentinel for human, environmental and foodborne health risks. These reports, which primarily relate to farmed animal species, summarise the surveillance activities of the Animal and Plant Health Agency (APHA) and the Scottish Agricultural College Consulting, Veterinary Services (SACCVS, operating within Scotland's Rural College – SRUC) 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 January and March 2018.

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. Orphan 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, e.g. brucellosis or TB. Information concerning notifiable or reportable zoonoses is recorded elsewhere, some under specific projects such as FZ2000 (*Salmonella*).

1. General scanning surveillance

1.1 Orphan Zoonoses VIDA data for Great Britain: January – March 2018

This table (collated 20/04/2018) summarises clinical diagnoses of orphan zoonoses and infections shared between animals and humans from specimens submitted to APHA and SACCVS veterinary investigation centres between January and March 2018 and compares the findings with the same quarter (Q1) in 2016 and 2017. 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). It 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, January - March 2018

VIDA codes	Diagnosis	Total (all species)			<i>Diagnoses in 2018</i>							
		2016	2017	2018	Cattle	Sheep	Goats	Pigs	Birds ¹	Misc	Wildlife ²	
311	Babesiasis	1	0	0	0							
258 & 659	Brachyspira pilosicoli/intestinal spirochaetosis	3	6	0				0	0			
188 & 253	Brucella in marine mammals	0	0	0						0	0	
013	<i>Campylobacter</i> fetopathy	122	132	68	2	66	0			0	0	
282	Chlamydiosis (<i>C. psittaci</i>)	0	0	0					0			
014	<i>Chlamydophila abortus</i> fetopathy	318	193	173	0	172	1			0	0	
732	<i>Corynebacterium pseudotuberculosis</i> (CLA)	1	5	1		1	0					
318	Cryptosporidiosis	170	138	128	111	16	1	0	0	0	0	0
362	Cysticercosis	1	0	0		0						
193	Dermatophilus infection	1	0	2	0	1	1		0	0		
022, 133 & 615	Erysipelas	5	5	0		0	0	0	0	0		
371, 372 & 373	Fasciolosis	180	302	273	94	171	4			4	0	
363	Hydatidosis	0	0	0		0						
015, 136 & 139	Leptospirosis (all categories)	3	1	1	1	0	0	0		0	0	
016, 140, 150, 189 & 711	Listeriosis (all categories)	113	72	68	18	46	4	0	0	0	0	0
217	Louping ill	1	1	0	0	0			0			

225	Orf (parapox virus)	9	5	10		9	0			1	
152,153, 157, 158	<i>Pasteurella multocida</i> pneumonia/pasteurellosis	47	59	60	34	14	0	10	0	2	0
223	Pseudocowpox (parapox virus)	0	0	1	1						
027 & 262	Q Fever/ <i>Coxiella burnetii</i>	5	2	2	1	1	0			0	0
374	Red Mite (<i>Dermanyssus galinae</i>)	0	3	0					0		
195	Ringworm	7	5	2	1	0	0	1	0	0	0
379, & 392	<i>Sarcoptes scabiei</i> infection	1	0	2	0		0	2		0	
024, 171, 172 & 644	Streptococcal infection (excluding bovine mastitis)	39	42	38		2	0	33	0	3	0
745	Swine influenza	13	6	6				6			
026 & 315	Toxoplasmosis (incl. fetopathy)	170	140	115		115	0			0	0
142	Tuberculosis (excl. <i>M. bovis</i>)	9	5	4			0	0	3	1	0
034 & 154	Yersiniosis (incl. fetopathy)	5	12	5		5	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 practicing 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/reports.htm>

1.2 Highlights from APHA and SACCVS disease surveillance centres

This section provides a summary of main items of zoonotic interest from material submitted to the APHA (England and Wales) and SACCVS (Scotland) between January and March 2018.

Further information is provided in the quarterly reports by the APHA species groups and the monthly surveillance reports in the Veterinary Record derived from scanning surveillance. Both sets of these reports may be found at: <http://apha.defra.gov.uk/vet-gateway/surveillance/reports.htm>

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 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 59,000 cases reported in 2016. 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

A total of 72 campylobacter isolates (mainly from ruminant abortion cases in England and Wales) were identified by the APHA Starcross laboratory during the period January to March 2018; of those, six originated from cattle and 66 originated from sheep.

Of the six bovine isolates, two were identified as *C. jejuni*, two were *C. fetus fetus* and two were *C. sputorum*. The two *C. sputorum* isolates and one *C. fetus fetus* and one *C. jejuni* isolates were each identified from bovine sheath washings.

Of the 66 ovine isolates, 45 were *C. fetus fetus*, eight were *C. sputorum*, 11 were *C. jejuni* and 2 were *C. coli*.

Two *C. fetus* submissions from English abortion cases were submitted to SACCVS, including one bovine and one ovine case.

Scotland

SACCVS isolated *Campylobacter fetus* from five bovine abortion submissions.

Sixteen submissions were received from ovine abortion cases, including *C. fetus* (10), *C. jejuni* (4), *C. Sputorum* (1) and *Campylobacter sp.* (1).

Fifty-eight isolations were made from canine faecal samples, including *C. upsaliensis* (40), *C. jejuni* (12), *C. lari* (3) and *Campylobacter sp.* (3). Eight isolations were made from feline faeces, including *C. upsaliensis* (6), *C. jejuni* (1), and *C. lari* (1).

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 January and March 2018, a total of 89 specimens from 38 separate submissions (kidneys from 15 cattle, 72 pigs and two sheep) were examined by real-time PCR for pathogenic leptospires. No leptospires were detected in any of the tested samples. Eight of the samples submitted were unsuitable for testing.
2. 1440 serum samples from a range of species were examined. Of 206 canine sera, 16.5% and 7.2% were positive to *L. Canicola* and *L. Icterohaemorrhagiae* respectively, compared to 12.6% and 13% for the same quarter last year; of 351 bovine samples examined for *L. Hardjo bovis*, 8.5% were positive (11.1% in Q4 2017); 1.3% of 76 porcine samples tested for *L. Bratislava* were positive (5.0% in Q4 2017). Other significant serovars noted included 15 dogs positive to *L. Australis*, 18 positive to *L. Bratislava* and 16 positive to *L. Copenhageni*. 7 horse samples tested positive for *L. Australis*.
3. Between January and March 2018, five (20%) of 25 bulk milk *L. hardjo* antibody tests undertaken for monitoring purposes were negative, two (8%) were low-positive, five (20%) were mid-positive and 13 (52%) were high positive. In 2017, figures for the same quarter (61 tests) were 16.4% negative, 29.5% low positive, 11.5% mid positive and 42.6% 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. The number of bulk milk submissions for leptospirosis testing was down 59% compared to the same quarter in 2017. A significant reduction in the number of samples submitted for bulk

milk testing has been observed throughout the course of 2017 and continued in the first quarter of 2018.

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 foetal 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 provided: [Q fever: Information for farmers](#)

Two Q fever submissions related to abortions, one in a sheep and one in a cow. In both cases, there were changes within the placenta and *Coxiella spp.* were identified on MZN smears. *Coxiella burnetii* DNA was confirmed by PCR testing; however, this finding does not conclusively confirm Q fever as the cause of the abortion. In fact, in the sheep case, the placenta also tested positive for *Chlamydia psittaci/abortus* by PCR.

2.5 Streptococcus suis

Streptococcus suis isolates from diagnostic material submitted to APHA and SACCVS Veterinary Investigation Centres are typed further for disease surveillance purposes. The numbers and serotypes from porcine diagnostic material submitted during the period January – March 2018 are shown below, with data for the same quarter in previous years for comparison. UT = untypeable

Year (Q1)	1	2	3	4	5	6	7	8	9	10	12	13	14	21	33	1/2	1/14	UT	Total
2013	1	12	1		1		1								1	4	1	6	28
2014	1	13			1		5	2	1		2					1		2	28
2015	1	17		1			1	2					1	1			2	2	28
2016	1	20		1			5	2					6		1			2	38
2017	6	13	1	2			6		3	2			1					4	38
2018	5	21	2	1		1	7	1				1	7					3	49

Streptococcus suis type 2 again predominated as in previous years, but there is a notable spread across serotypes.

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 January to March 2018, 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 may also be diagnosed through antigen testing of placental tissue, and in sheep and goats through IFAT testing of foetal blood or body fluid.

In sheep, 86 samples originating from 21 premises were tested, of which 46 (53.5%) were positive for antibodies to *T. gondii*. These originated from 15 different premises. In goats, samples from 11 individual animals from one holding were tested. Two of them tested positive and nine tested negative.

The number of sheep submissions was significantly lower (55.7%) compared to the same quarter of last year, and the percentage of positive submissions dropped slightly from 58.2% in 2017 to 53.5% in 2018.

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:

<http://www.hps.scot.nhs.uk/resourcedocument.aspx?id=1190>

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 PHE/PHW and in collaboration with the National Cryptosporidium Reference Unit, Swansea, and follow jointly agreed guidelines.

No *Cryptosporidium* investigation was conducted in this quarter.

3.2 VTEC O157

Verocytotoxigenic-producing *E. coli* (VTEC) O157 outbreak investigations are undertaken, according to agreed guidelines, at the request of CsCDC of PHE/PHW (CsPHM in Scotland) where an animal-associated source is suspected. These investigations variously involve collaboration with other organisations, including the Environmental Health Departments of Local Authorities and the Health and Safety Executive. Determination of phage type (PT), verocytotoxin (VT) type, and comparison of human and animal isolates by variable number of tandem repeat (VNTR) analysis are performed by the Gastrointestinal Infections Reference Unit of the Laboratory of Gastrointestinal Pathogens, PHE Colindale. If isolates from animals circumstantially implicated in outbreaks have the same PT and indistinguishable VNTR profiles from human cases, this is taken as confirmatory evidence of a causal association. In practice, there can be minor VNTR profile variation at a single tandem repeat locus amongst some isolates associated with an outbreak investigation. Other VTEC O157 PTs may be detected incidentally during the investigation of animal premises.

No investigations into VTEC outbreaks were conducted in the first quarter of 2018.

3.3 *Corynebacterium ulcerans*

Corynebacterium ulcerans was first isolated from cases of throat disease 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 through throat swabbing of in-contact companion animals.

One investigation into an outbreak was conducted in January 2018.

Toxigenic *C. ulcerans* was detected from a patient's throat swab and APHA were approached because of the possible zoonotic risk from the case's six cats. APHA arranged throat swabbing of the six cats by the case's local veterinary surgeon and dispatched charcoal swabs to the practice in question. These swabs were returned to APHA Starcross for culture, with no evidence of *C. ulcerans* in any of the swabs.