Animal & Plant Health Agency

Zoonoses and Veterinary Public Health

Quarterly report Q2 – April-June 2018

Project FZ2100

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Contents

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 April and June 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: April-June 2018

This table (collated 25/07/2018) summarises clinical diagnoses of orphan zoonoses and infections shared between animals and humans from specimens submitted to APHA and SACCVS veterinary investigation centres between April and June 2018 and compares the findings with the same quarter (Q2) 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 April - June 2018**

VIDA codes	Diagnosis	Total (all species)			*Diagnoses in April – June 2018*						
		2016	2017	2018	Cattle	Sheep	Goats	Pigs	Birds [1]	Misc	Wildlife [2]
311	Babesiasis	5	2	1	1						
258 & 659	Brachyspira pilosicoli/intestinal spirochaetosis	2	5	4				4	0		
188 & 253	Brucella in marine mammals	0	0	0						0	0
013	Campylobacter fetopathy	12	10	15	2	13	0			0	0
282	Chlamydiosis (*C. psittaci*)	0	0	0					0		
014	*Chlamydophila abortus* fetopathy	44	28	14	0	14	0			0	0
732	*Coryne. pseudotuberculosis (CLA)*	8	2	4		3	1				
318	Cryptosporidiosis	210	137	178	129	45	2	1	0	1	0
362	Cysticercosis	0	1	0		0					
193	Dermatophilus infection	2	0	0	0	0	0		0	0	
022, 133 & 615	Erysipelas	13	4	1		1	0	0	0	0	
371, 372 & 373	Fasciolosis	106	104	145	79	59	3			4	0
363	Hydatidosis	0	0	0		0					
015, 136 & 139	Leptospirosis (all categories)	2	0	3	3	0	0	0		0	0
016, 140, 150, 189 & 711	Listeriosis (all categories)	47	19	42	6	33	3	0	0	0	0
217	Louping ill	10	13	1	0	0			1		

225	Orf (parapox virus)	13	8	9		9	0			0	
152,153, 157, 158	*Pasteurella multocida* pneumonia/pasteurellosis	57	57	73	25	35	1	8	2	2	0
223	Pseudocowpox (parapox virus)	0	0	0	0						
027 & 262	Q Fever/*Coxiella burnetii*	5	0	1	1	0	0			0	0
374	Red Mite *(Dermanyssus gallinae)*	2	2	1					1		
195	Ringworm	0	2	3	1	2	0	0	0	0	0
379, & 392	*Sarcoptes scabei infection*	1	0	2	0		0	2		0	
024, 171, 172 & 644	Streptococcal infection (excluding bovine mastitis)	39	44	24		6	0	18	0	0	0
745	Swine influenza	6	4	6				6			
026 & 315	Toxoplasmosis (incl. fetopathy)	50	30	28		27	0			1	0
142	Tuberculosis (excluding *M.bovis)*	7	3	1			0	0	0	1	0
034 & 154	Yersiniasis (incl. fetopathy*)*	4	3	1		0	0	1	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

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

Nothing to report this Quarter.

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 36 campylobacter isolates (mainly from ruminant abortion cases in England and Wales) were identified by the APHA Starcross laboratory during the period April to June 2018; of those, 11 originated from cattle and 25 originated from sheep.

Of the 11 bovine isolates, six were *C. fetus fetus*, one was *C. fetus venerealis*, two were *C. hyointestinalis* and two were non-typable.

Of the 25 ovine isolates, 20 were *C. fetus fetus*, four were *C. jejuni* and one was *C. coli.*

Scotland

SACCVS isolated *Campylobacter fetus* from two out of three fetal submissions from bovine abortions, in the third a *Campylobacter sp* was identified.

10 aborted ovine fetuses yielded six *C. fetus,* two *C. jejuni,* and two *Campylobacter sp.*

Of the 72 submitted canine faeces samples, 38 were *C. upsaliensis,* 22 *C. jejuni,*

10 *C. lari,* 1 *C. coli* and 1 *Campylobacter sp.*

All four submitted feline faeces samples yielded *C. upsaliensis.*

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 2018, a total of 62 specimens from 29 separate submissions (kidneys from 18 cattle, 43 pigs and one dog) were examined by real-time PCR for pathogenic leptospires. No leptospires were detected in any of the tested samples. Eleven of the samples submitted were unsuitable for testing.

2. Over the same period, 894 serum samples from a range of species were examined. Of 186 canine sera, 11.3 % and 1.8% were positive to *L.* Canicola and *L.* Icterohaemorragiae respectively, compared to 12.6% and 13.3 % for the same quarter last year; of 311 bovine samples examined for *L.* Hardjo bovis, 18.3 % were positive (8.5% in Q1 2018); from 18 samples received, there were no positive porcine samples tested for *L.* Bratislava (1.3% in Q1 2018). There were no other significant results.

3. Between April and June 2018, six (24%) of 25 bulk milk *L. hardjo* antibody tests undertaken for monitoring purposes were negative, three (12%) were low-positive, four (16%) were mid-positive and 14 (56%) were high positive. Between April and June 2017, nine (26.5%) of 34 bulk milk *L. hardjo* antibody tests undertaken for monitoring purposes were negative, two (5.9%) were low-positive, five (14.7%) were mid-positive and 18 (52.9%) were high positive. In recent years a significant reduction in the number of samples submitted to APHA for bulk milk testing has been observed. Whilst the number of submissions has remained the same this

quarter as the previous quarter (25), there is a 26% reduction compared with the same quarter in 2017 (Q2), and a 67% reduction compared with quarter 2 in 2016.

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

The one positive Q fever submission related to abortion in a cow. Placental tissue was received and suspect *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.

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 April to June 2018 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	16	21	25	26	33	1/2	UT	TOTAL
2013	3	**8**	2	1	1	1	1	1			1						1	1		21
2014		**4**		1	1	2	1	2	1		1		1							14
2015	3	**11**	1	1	1	1					3							3		24
2016		**14**	1			4	3	1			1		1		1	1		1	2	**30**
2017	1	**19**	1		1	5			1		1	1		1				1	6	**38**
2018	7	**6**	2	1	1	2		2		1	5								5	**32**

For the first time in over a decade, serotype 2 was not the predominant serotype isolated from pigs in APHA diagnostic submissions. This may be a transient effect and will be kept under review, or may reflect testing of younger pigs which are more likely to have Type 1.

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 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 fetal blood or body fluid.

In sheep, 25 samples originating from 7 premises were tested, of which 15 samples (60%) were positive for antibodies to *T. gondii*. In goats, a sample from one individual animal from one holding was tested with negative results. In addition, three alpacas from a single premises were tested, with one sample positive (please note: this test is not validated for camelids). The number of sheep submissions was significantly lower (63%) compared to the same quarter last year.

Please consult the Table in section 1 which includes results for fetopathy due to toxoplasmosis.

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.

APHA were contacted by Public Health England/Public Health Wales on five occasions over the Quarter to ask for our assistance in the investigation of cases of human cryptosporidiosis epidemiologically linked to visits to open farm premises. This is traditionally the busiest Quarter for such 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 the major risk factor for the zoonotic spread of *Cryptosporidium parvum* in these settings, with the availability of hand-washing facilities supplying hot water and soap as opposed to antimicrobial gel also extremely important. The role of APHA in these investigations is to provide expert veterinary advice on animal husbandry and welfare to the relevant Incident Control Team, to visit the farm if necessary and collect faecal samples for testing and to provide input into the overall recommendations for the prevention of further cases during the current outbreak and for the future. The importance of the early involvement of APHA in these investigations, as soon as there is a confirmed epidemiological link to animal contact, has been emphasised to the relevant authorities as any delays in animal testing may greatly influence the test results which can in turn prevent the establishment of a firm scientific link between animal contact and human cases through genotyping of isolates.

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 Whole Genome Sequencing (WGS) 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.

VTEC E coli outbreak investigation linked with a petting farm

Following the diagnoses of three human cases with VTEC infection epidemiologically linked to an open (petting) farm, PHE requested support from APHA. The APHA initially visited the farm on the 28th June 2018 and again on the 3rd July 2018 when 43 animal and environmental samples were collected. The farm was generally neat and tidy during both visits and the APHA received very good cooperation and assistance from the manager and staff. The weather was hot and dry at the time of the visits and had been for several weeks so paths etc. were dry and it was therefore not possible to assess puddles or track movement/flow of mud/muck/contaminated water. Environmental samples and food pellet samples which had been taken by Environmental Health Officers (EHOs) on 19th June 2018 were all negative for *E. coli* O157. Animal faecal samples taken by the farm's private vet on the 22nd June 2018 (laboratory and testing methodologies used from the private lab were unknown) also tested negative. In contrast, the final results from APHA samples from the animals and the environment confirmed that 11/43 samples had *E. coli* O157 isolated that very closely matched the *E. coli* O157 that was cultured from the three human cases. PHE conclusion was that it was highly likely that the human cases (Cases 1, 2 and 3) acquired *E. coli* O157 during their visits to the farm.

The conclusion from the APHA investigation was that the farm already had good practices in many areas but that there were some areas that could be considered to further reduce the risk of VTEC to visitors. The APHA culture results indicated a fair number of contaminated sites/areas with different animal species potentially infected and shedding the organism. However, the small number of clinical cases reported (three) in comparison to the number of people visiting, strongly suggested that the control measures in place were already very comprehensive and effective. Since laboratory results confirmed the presence of *E coli* O157 on the site, the APHA recommendations were aimed at reducing the spread of the organism (ultimately to the mouths of the visiting public and staff) rather than eradicating the organism from the site, which was not seen to be a practical option.

APHA recommendations were focused on limiting the spread of contamination around the premises with emphasis on visitor areas and limiting contamination of visitor's footwear and hands. The farm owners were advised to provide access routes for workers, equipment and/or animals, to and from livestock-pens, which do not use/cross public walkways. In addition cleansing and disinfection procedures to control or eliminate contamination of public walkways should be considered. This was thought to be particularly important during the routine daily procedures such as mucking out, feeding and watering. It was recommended to review the type and positioning of hand wash facilities. It was evident that the portable hand wash basins were not easy to use by small children to effectively wash their hands. Easy access to and signage for hand wash basins in areas where shoes are removed and replaced, was also requested. Bottle feeding of lambs by the public was discouraged for the remainder of the season until the lamb feeding area was concreted to allow adequate cleaning and disinfection.

The importance of the business model and the difficulties that the suggested additional control measures had caused were recognised during APHA final visit carried out on the 18th July 2018 when the APHA general recommendations and the recommendations for specific areas/activities were extensively discussed with the farm management. On the final visit, the APHA had emphasised the high standards of control measures on the farm, the good staff co-operation with the investigation and recommendations, and the fact that no visit to the countryside or farm was ever without risk of infection and therefore the importance of responsibility of those visiting in following the advice provided to protect themselves and their children.

Please note that the term VTEC has been superseded by STEC (Shiga toxin-producing *Escherichia coli*) in the human field.

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. diptheriae*. 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 incident was conducted in May 2018.

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