



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 Veterinary Laboratories Agency (VLA) for predominantly non-statutory zoonoses and infections shared between man and animals in England and Wales using data gathered by the network of Regional Laboratories (RLs), and briefly describe veterinary investigations into appropriate incidents undertaken at the request of the public health authorities. Quantitative diagnostic data for all of Great Britain, is provided by the VIDA surveillance system, which includes information from the Scottish Agricultural College (SAC) Veterinary Services. This report covers the three month period between July and September 2008. The Non-Statutory Zoonoses project (FZ2100) is funded by Defra through the VLA's Food and Environmental Safety programme and also uses returns from the Emerging Diseases and Welfare programme. Information concerning compulsorily notifiable or reportable zoonoses is recorded elsewhere under other projects such as FZ2000 (Salmonella).

Contents

| Section | Subject | Page |
|-----------|--|------|
| 1. | General scanning surveillance | |
| 1.1 | VIDA data for Great Britain: July - September 2008 | 2 |
| 1.2 | Recent reports from Regional Laboratories | 3 |
| 2. | Specific scanning and targeted surveillance and other studies | |
| 2.1 | Campylobacter | 4 |
| 2.2 | Cryptosporidium | 4 |
| 2.3 | <i>E. coli</i> | 4 |
| 2.4 | Leptospirosis | 4 |
| 2.5 | <i>Streptococcus suis</i> | 5 |
| 2.6 | Toxoplasmosis | 5 |
| 2.7 | <i>Trichinella spiralis</i> | 5 |
| 3. | Investigations into zoonotic and potentially zoonotic incidents | |
| 3.1 | Cryptosporidiosis | 5 |
| 3.2 | VTEC O157 | 6 |

1. General scanning surveillance

1.1 VIDA data for Great Britain: July – September 2008

This table (collated 14/10/08) summarises clinical diagnoses of non-statutory zoonoses and infections shared between animals and man from specimens submitted to VLA and SAC laboratories between July and September 2008 (Q3) and compares the findings with the same quarters in 2007 and 2006. 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. This revised format, which incorporates SAC data, was first introduced in January 2008.

| Diagnosis | Q3 Total (all species) | | | Q3 Diagnoses in 2008 | | | | | | |
|---|------------------------|------|------|----------------------|-------|-------|------|--------------------|------|-----------------------|
| | 2006 | 2007 | 2008 | Cattle | Sheep | Goats | Pigs | Birds ¹ | Misc | Wildlife ² |
| Babesiosis | 13 | 8 | 7 | 7 | | | | | | |
| <i>Brachyspira pilosicoli</i> | 7 | 6 | 8 | | | | 8 | | | |
| Brucella in marine mammals | 0 | 0 | 0 | | | | | | 0 | 0 |
| Campylobacter fetopathy | 6 | 3 | 4 | 4 | 0 | 0 | | | 0 | 0 |
| Chlamydiosis (<i>C. psittaci</i>) | 0 | 1 | 0 | | | | | 0 | | |
| <i>Chlamydomphila abortus</i> fetopathy | 0 | 1 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| <i>Coryne. pseudotuberculosis</i> (CLA) | 22 | 26 | 25 | | 24 | 1 | | | | |
| Cryptosporidiosis | 142 | 146 | 156 | 152 | 0 | 3 | 0 | 0 | 1 | 0 |
| Cysticercosis | 0 | 0 | 0 | | 0 | | | | | |
| Dermatophilus infection | 0 | 17 | 10 | 4 | 5 | 0 | | 0 | 1 | |
| Erysipelas | 16 | 10 | 14 | | 5 | 1 | 6 | 2 | | |
| Fasciolosis | 135 | 115 | 230 | 172 | 52 | 0 | | | 6 | 0 |
| Hydatidosis | 0 | 0 | 0 | | 0 | | | | | |
| Leptospirosis (all categories) | 16 | 13 | 3 | 3 | 0 | 0 | 0 | | 0 | 0 |
| Listeriosis (all categories) | 10 | 13 | 15 | 2 | 13 | 0 | 0 | 0 | 0 | 0 |
| Louping ill | 24 | 14 | 8 | 4 | 4 | | | 0 | | |
| Orf (parapox virus) | 7 | 17 | 19 | | 19 | 0 | | | | |
| <i>Pasteurella multocida</i> pneumonia/pasteurellosis | 71 | 47 | 38 | 9 | 9 | 0 | 14 | 5 | 0 | 1 |
| Pseudocowpox (parapox virus) | 0 | 0 | 0 | 0 | | | | | | |
| Q Fever / <i>Coxiella burnetii</i> | 2 | 2 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| Red Mite (<i>Dermanyssus galinae</i>) | 28 | 7 | 11 | | | | | 11 | | |
| Ringworm | 7 | 8 | 8 | 5 | 2 | 0 | 0 | 0 | 0 | 1 |
| <i>Sarcoptes scabiei</i> infection | 0 | 1 | 2 | 0 | | 0 | 2 | | | |
| Streptococcal infection (excluding bovine mastitis) | 20 | 31 | 27 | | 2 | 0 | 24 | | 1 | 0 |
| Swine influenza | 1 | 0 | 4 | | | | 4 | | | |
| Toxoplasmosis (incl. fetopathy) | 2 | 2 | 2 | | 2 | 0 | | | 0 | 0 |
| Tuberculosis (excl. <i>M. bovis</i>) | 5 | 11 | 7 | | | 2 | 0 | 4 | 1 | 0 |
| Yersiniosis (incl. fetopathy) | 2 | 5 | 1 | | 0 | 0 | | 1 | 0 | 0 |

Shaded boxes indicate the diagnosis is not recorded or not applicable for that species

¹ Includes both domestic and wild birds ² Mammals only

Comments

There was a marked increase in the number of diagnoses of fasciolosis (a very rare zoonotic infection) compared to the same period in 2007. Most cases were in known endemic areas and reflected the prevailing wet conditions and relatively high temperatures which continued into the autumn. Reductions in the number of cases in some disease categories mainly appeared to reflect a decline in the number of submissions to diagnostic

laboratories rather than a change in the proportion of diagnoses reached, although there may also still be some short-term anomalies associated with the recent inclusion of data from Scotland.

1.2 Recent reports from Regional Laboratories

This section provides an overview of the main diagnoses and observations concerning zoonotic non-statutory diseases and infections shared between man and animals based on submissions to the VLA (England and Wales only) during the period July to September 2008. It includes incidents that are not necessarily recorded in table 1.1 above and hence there may be some apparent discrepancies. Further information is provided in the reports by the VLA species groups and the monthly surveillance reports in the Veterinary Record derived from the Emerging Diseases and Welfare programme.

Cattle

Cryptosporidiosis was commonly diagnosed as a cause of calf diarrhoea. **Campylobacter fetus**, **Pasteurella multocida** and **Yersinia pseudotuberculosis** were variously identified as the causes of bovine abortion. **Listeria monocytogenes** was isolated from the meningeal fluid of a dairy cow with neurological dysfunction and elsewhere listeria infection was suspected from brain histopathology. **Dermatophilus congolensis** was isolated from a five-week-old calf with extensive skin lesions. Nine of 11 milking cows were found to be seropositive for **Q fever** (probably an incidental finding) during an investigation into milk drop and abortion in a dairy herd. Inclusion bodies typical of **Babesia** spp. were identified in a blood smear from a dairy cow with anaemia and haemoglobinuria. Cases of **fasciolosis** were identified in adult cattle with weight loss and diarrhoea. A farm visit was carried out as a follow-up to a calf necropsy in which **Toxocara vitulorum** were present; no further cases were identified.

Sheep and goats

Listeria monocytogenes was isolated from the liver and lung of two sheep that died suddenly, and from the brainstem of an ataxic ram. *L. monocytogenes* and *L. innocua* were isolated from conjunctival swabs from a lamb with bilateral ocular disease. **Erysipelas rhusiopathiae** was isolated from the livers of two lambs that died suddenly and a batch of arthritic lambs had high titres for *E. rhusiopathiae*. **Corynebacterium pseudotuberculosis** was isolated from sheep on several occasions, including from a brain abscess in a ram. **Mycobacterium avium** was cultured from the mediastinal lymph nodes of an adult goat with a history of weight loss. **Cryptosporidium** oocysts were detected in faeces of an eight-week-old goat kid that had been scouring for a month. **Fasciolosis** was diagnosed by necropsy in a yearling ewe and large numbers of fluke eggs subsequently detected in composite faeces samples. **Parapoxvirus** (orf) was demonstrated by electron microscopy in skin scrapings taken from a group of four-month-old lambs. Ringworm (**Microsporum canis** and **Trichophyton** sp.) was seen in lambs on several occasions.

Pigs

Streptococcus suis type 2 caused meningitis and/or septicaemia in recently weaned pigs on several units. **S. suis type 7** caused respiratory disease in finishers. **E. rhusiopathiae** was isolated from a pet pig with septicaemia which had died suddenly, and elsewhere from a pig with septicaemia. **P. multocida** septicaemia caused sudden death of a fattening pig. **Brachyspira pilosicoli** was isolated from grower and rearer pigs with diarrhoea.

Birds

P. multocida septicaemia (fowl cholera) was seen in fattening turkeys and in a mute cygnet (*Cygnus olor*) with airsacculitis and peritonitis. **Streptococcus gallolyticus** subspp **gallolyticus** (formerly **Streptococcus bovis** biotype 1) was identified in the livers of Mallard ducklings – this is a recognised cause of endocarditis in poultry and humans. **E. rhusiopathiae** septicaemia caused the death of turkey poults. **Avian tuberculosis** (*Mycobacterium avium*) was the likely cause of granulomatous lesions in lung tissue of a laying hen with respiratory signs in a small flock, and caused chronic granulomatous hepatitis in a wild adult mallard duck submitted for avian influenza screening. **Red mite infestation** (*Dermanyssus gallinae*) was diagnosed several times as the cause of anaemia and death in both commercial and backyard laying hens.

Miscellaneous other species and wildlife

L. monocytogenes septicaemia caused the death of an adult female alpaca and alpaca cria. *Streptococcus canis* and *P. multocida* were isolated from a septicaemic badger with a bite wound. *M. avium* was suspected as the cause of ill-thrift in a male waterbuck (*Kobus Ellipsiprymnus*), the second case in the herd this year. *M. microti* was isolated from a submandibular lump on a domestic cat. *Cryptosporidium parvum* was identified by PCR in the faeces of a farmed five-day-old diarrhoeic red deer calf on premises where scour and high mortality had previously been reported in neonatal calves. *Fasciolosis* was diagnosed in a thin scouring American Bison (*Bison bison*) in a zoological collection. *Sarcoptic mites* were found in skin scrapings from alpaca with suspected mange. *Ringworm* (*Trichophyton erinacei*) was diagnosed in a hedgehog (*Erinaceus europaeus*) with scurfy skin lesions.

2. Specific scanning and targeted surveillance and other studies

2.1 Campylobacter

A summary of findings from the confirmation and speciation of campylobacters and other related potentially zoonotic organisms submitted to the VLA via various routes, including VLA regional Laboratories and private laboratories, will be presented in the annual report.

2.2 Cryptosporidium

Survey of Cryptosporidium in calves 2008: a 12 month survey to assess the potential zoonotic hazard and environmental burden of *Cryptosporidium* spp. in calves is progressing well. *Cryptosporidium* oocysts were detected by the fluorescent antibody test in 14 (41%) of 34 samples from calves submitted for diagnostic necropsy this quarter.

2.3 E. coli

A survey to enhance surveillance of *E. coli* from diagnostic submissions to RLs, which was introduced in 2005 to detect new and emerging strains of potential zoonotic importance (particularly VTECs), has now ended and a summary of the main findings will be provided in the annual report.

2.4 Leptospirosis

Targeted surveillance for leptospirosis is variously achieved by analysis of results from: (1) RT-PCR for pathogenic leptospire 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) 102 specimens (mainly fetal kidneys) from a range of species (mainly cattle and pigs, also one alpaca, one seal and one rat) were examined by RT-PCR for pathogenic leptospire: none were detected.

2) 2913 serum samples were examined. Of 1113 canine sera, 46.2% and 13.1% were positive to *L. Canicola* and *L. Icterohaemorrhagiae* respectively, compared to 48.6% and 1.6% for the same quarter last year; of 1497 bovine samples examined for *L. Hardjo bovis*, 24.1% were positive (34.9% in 2007); 42.6% of 211 porcine samples tested for *L. Bratislava* were positive (12.6% in 2007). Other significant serovars noted included 17 dogs positive to *L. Bratislava*, 2 positive to *L. Zannoni*, 1 positive to *L. Pomona* and 28 positive to *L. Copenhageni*; 4 horses were positive to *L. Bratislava*.

3) Ninety three (33.5%) of 278 bulk milk antibody tests undertaken were negative, 41 (14.7%) were low-positive, 31 (11.2%) were mid-positive and 113 (40.6%) were high-positive. In 2007, comparable figures for the same

quarter (387 tests) were 27.6% negative, 17.6% low-positive, 13.4% mid-positive and 41.3% high-positive. These findings continue to indicate serological evidence of potentially active infection in just over 50% of dairy herds from the population submitting samples, although the significance of these observations is heavily influenced by vaccination status and selection bias.

2.5 *Streptococcus suis*

The numbers and serotypes of *Streptococcus suis* isolates from porcine diagnostic material examined by RLs during the quarter are shown in the table below, with data for the same period in 2006 and 2007 for comparison.

| Year | 1 | 2 | 3 | 4 | 5 | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 | 25 | 31 | 33 | 1/2 | UT | Totals |
|------|---|----|---|---|---|---|---|---|----|----|----|----|----|----|----|----|-----|----|--------|
| 2006 | | 3 | | | | | | | | 1 | | | | | | 1 | | | 5 |
| 2007 | | 19 | 3 | 1 | | 3 | | 4 | 1 | | | | 1 | | | | | | 32 |
| 2008 | 2 | 11 | 1 | 2 | 1 | 2 | 1 | 3 | | | 1 | | | | | | | 1 | 25 |

Streptococcus suis type 2 again predominated.

2.6 Toxoplasmosis

A recent comprehensive report by 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 VLA on sera submitted to RLs. The findings presented below provide a summary of the serological status of samples submitted for diagnosis, monitoring and screening purposes during the quarter 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.

In sheep, 25 (64%) of 39 sera tested (from 6 separate submissions) were positive for *T. gondii*. No samples were examined from other species.

2.7 *Trichinella spiralis*

From January 2006 enhanced testing for *Trichinella spiralis* (by the EU approved pepsin digest method specified in Commission Regulation SANCO 2537/2005) was extended to the domestic slaughter of all boars, sows and farmed wild boar. Testing of samples from small abattoirs was undertaken by VLA Langford, Thirsk and Bury St Edmunds under contract to the Meat Hygiene Service and the results are summarised below. VLA Weybridge is also collaborating with the Central Science Laboratory, York, in surveying foxes.

Between July and September 2008 a total of 2967 individual samples (from 925 submissions) were received by VLA for testing in pools each consisting of up to three different submissions. There were 88 equine submissions, 732 from boars/sows and 105 from wild boar. All gave negative results.

3. Investigations into zoonotic and potentially zoonotic incidents

3.1 Cryptosporidiosis

Investigations to assist in human outbreaks of cryptosporidiosis linked to direct contact with animals are undertaken (under a MoU) at the request of Consultants in Communicable Disease Control (CsCDC) of HPA/NPHS and in collaboration with the National Cryptosporidium Reference Unit, Swansea and follow jointly agreed guidelines.

No requests for joint investigations were received during this quarter.

3.2 VTEC O157

VTEC O157 outbreak investigations are undertaken according to agreed guidelines at the request of CsCDC of HPA/NPHS (under a MoU) where an animal-associated source is suspected, and 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), Verotoxin (VT) type and comparison of human and animal isolates by pulsed field gel electrophoresis (PFGE) and variable number of tandem repeat (VNTR) analysis are performed by the *E. coli*/Shigella/Yersinia/Vibrio Reference Unit of the Laboratory of Gastrointestinal Pathogens, HPA Centre for Infections, Colindale. If isolates from animals circumstantially implicated in outbreaks have the same PT and indistinguishable PFGE profiles from human cases, this is taken as confirmatory evidence of a causal association. In practice, there can be minor PFGE profile variation amongst some isolates associated with an outbreak investigation. VNTR profiles of strains within an outbreak can also show variation at a single tandem repeat locus; application of this method is currently under development. Other VTEC O157 PTs may be detected incidentally during the investigation of animal premises.

There were four investigations during this quarter as summarised below:

1. In August, VLA investigated two dairy farms and a smallholding linked to five human cases of VTEC O157 PT34, VT2, including two babies attending a nursery. All human isolates had the same PFGE profile; VNTR profiling was within the parameters stated above. In one of the dairy herds, VTEC O157 PT 34, VT2 was isolated from 11 of 12 faecal samples from young stock and one of 70 samples taken from the milking herd. Two PFGE profiles were observed among the cattle strains; neither of these was identical to the human profile although they were clearly related to it. The VNTR profiles of 5 out of 6 cattle isolates differed from the human strain profile at one locus only and further VNTR work is in progress. In summary, results from the strain typing suggested a possible link between the cattle and human disease. VTEC O157 PT 4 (ie not the same as the outbreak strain) was isolated from one of 100 faecal samples from the other dairy herd; VTEC O157 was not detected from nine samples (from horses, dogs, a cat and rabbit) taken on the smallholding. Both these latter premises were excluded as possible sources.
2. In August, VLA undertook an investigation following reports of three human cases of VTEC O157 PT 21/28, VT2 infection linked to an open farm. VTEC O157 PT 21/28 was subsequently isolated from 20 (54%) of 37 faecal samples collected, with isolates obtained from goats, alpacas, ponies, donkeys and pigs. Strains from cases and from two goats, a horse and a pig had indistinguishable PFGE profiles and there were three variant but related profiles in goat, alpaca and donkey isolates. VNTR showed that isolates from human and animal sources had either the same profile or differed at one locus only. In conclusion, the results of strain typing were consistent with the open farm being the source of the outbreak. The risks associated with potential contamination of an overflow car park used for overnight grazing, and from public access to the goat pens, were highlighted by investigators and appropriate precautions adopted.
3. In September, VLA assisted the HPA with the investigation of three cases of human VTEC O157 PT 21/28, VT2 infection which were circumstantially linked to an open farm. VTEC O157 was not isolated from any of 28 samples taken from pens containing goats, lambs, guinea pigs and rabbits and no link with the cases was detected. This was noted to be a clean and well run premises with adequate, child-friendly hand washing facilities and prominent signage.
4. In September, VLA assisted with the investigation of a VTEC O157 PT21/28, VT2 outbreak comprising four cases linked to a farm visitor centre. One adult member of staff was affected as well as a young child who developed gastro-intestinal symptoms four days after visiting the park; several secondary asymptomatic cases were also subsequently identified. VTEC O157 PT21/28 was isolated from 8 (11%) of the 78 environmental and pooled faeces samples taken during the visit. Most of the positive samples were from goats, although VTEC O157 PT21/28 was also isolated from sheep, horse, donkey, pig, alpaca and bantam samples. Four human isolates and seven animal isolates from goat, horse, pig, sheep, donkey and bantam sources had indistinguishable PFGE profiles; the remaining isolate from an alpaca had a variant of this profile. Four human and seven animal isolates had the same VNTR profile and one isolate from a goat showed variation at one locus only. These data therefore confirmed an epidemiological link between the livestock and cases. Appropriate advice was given according to existing guidelines (Health and safety Executive 2002. Avoiding ill health at open farms – advice to farmers (with teacher's supplement). Agricultural Information sheet 23 (revised), HSE Books).