



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). Diagnostic data for Great Britain is provided by the VIDA surveillance system, including information from the Scottish Agricultural College (SAC) Veterinary Services. Summaries of joint veterinary/medical investigations into incidents and outbreaks of non-statutory zoonotic disease and associated activities are also included. This report covers the 12 month period between January and December 2007, with additional information for the last quarter of the year (October to December). 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 notifiable or compulsorily reportable zoonoses is recorded elsewhere under other projects such as FZ2000 (Salmonella).

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1. General scanning surveillance

1.1 Annual VIDA surveillance data for Great Britain 2007

This table (collated 30/01/2008) summarises clinical diagnoses in specimens submitted to VLA and SAC laboratories in 2007 and compares the findings with the 2006 and 2005 data. 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 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. It is intended as a general guide for veterinary and public health professionals to the diagnosed occurrence of animal-associated infections in predominantly farmed animal species.

| Diagnosis | Total (all species) | | | Species summary for 2007 | | | | | | |
|--|---------------------|------|------|--------------------------|-------|-------|------|--------------------|-------------------|-----------------------|
| | 2005 | 2006 | 2007 | Cattle | Sheep | Goats | Pigs | Birds ¹ | Misc ² | Wildlife ³ |
| Babesiosis | 19 | 21 | 16 | 16 | | | | | | |
| Brucella in marine mammals | 0 | 1 | 0 | | | | | | 0 | 0 |
| Campylobacter fetopathy | 145 | 165 | 210 | 23 | 187 | 0 | | | 0 | 0 |
| Chlamydiosis (<i>C. psittaci</i>) | 5 | 2 | 2 | | | | | 2 | | |
| <i>Chlamydophila abortus</i> fetopathy | 472 | 463 | 534 | 3 | 527 | 4 | | | 0 | 0 |
| <i>Coryne. pseudotuberculosis</i> (CLA) | 90 | 76 | 81 | | 77 | 5 | | | | |
| Cryptosporidiosis | 1339 | 1368 | 966 | 904 | 53 | 3 | 2 | 0 | 4 | 0 |
| Cysticercosis | 1 | 1 | 2 | | 2 | | | | | |
| Dermatophilus infection | 13 | 19 | 31 | 11 | 17 | 0 | | 0 | 3 | |
| Erysipelas | 41 | 44 | 52 | | 14 | | 13 | 25 | | |
| Fasciolosis | 952 | 984 | 718 | 506 | 190 | 5 | | | 17 | 0 |
| Hydatidosis | 0 | 0 | 0 | | 0 | | | | | |
| Leptospirosis (all categories) | 22 | 19 | 81 | 79 | 0 | 0 | 0 | | 1 | 1 |
| Listeriosis (all categories) | 208 | 202 | 113 | 36 | 72 | 5 | 0 | 0 | 0 | 0 |
| Louping ill | 46 | 47 | 41 | 12 | 29 | | | 0 | | |
| Orf (parapoxvirus) | 28 | 40 | 45 | | 43 | 2 | | | | |
| <i>Pasteurella multocida</i> /pasteurellosis | 324 | 307 | 217 | 139 | 17 | 0 | 47 | 12 | 2 | 0 |
| Pseudocowpox (parapoxvirus) | 1 | 0 | 0 | 0 | | | | | | |
| Q Fever (<i>Coxiella burnetii</i>) | 6 | 8 | 4 | 1 | 0 | 3 | | | 0 | 0 |
| Red Mite (<i>Dermanyssus galinae</i>) | - | 40 | 19 | | | | | 19 | | |
| Ringworm | 38 | 35 | 26 | 17 | 4 | 1 | 1 | 0 | 1 | 2 |
| <i>Sarcoptes scabiei</i> infection | 20 | 18 | 5 | 0 | | 0 | 5 | | | |
| Streptococcal infection (excl. mastitis) | 130 | 125 | 83 | | 14 | 0 | 65 | | 4 | 0 |
| Swine influenza | 23 | 13 | 7 | | | | 7 | | | |
| Toxoplasmosis (incl. fetopathy) | 378 | 333 | 379 | | 373 | 5 | | | 1 | 0 |
| Tuberculosis (excl. <i>M. bovis</i>) | 36 | 48 | 22 | | | 0 | 0 | 9 | 11 | 2 |
| Yersiniosis (incl. fetopathy) | 22 | 30 | 20 | | 8 | 2 | | 5 | 3 | 2 |

¹ Includes both domestic and wild birds

² Includes exotic and zoo animals

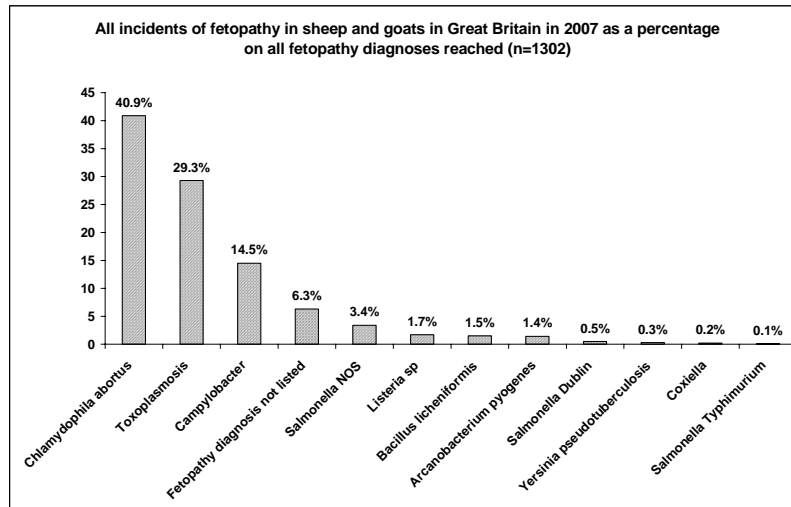
³ Mammals only

Shaded boxes indicate a diagnosis is not available for that species

Comments

This table is presented for the first time in this revised format and now includes data for Great Britain instead of England and Wales. The large increase in leptospirosis diagnoses in cattle mainly relates to abortions in Scotland although this increase is also partly reflected by the larger number of positive PCR results from cattle in England and Wales (See 2.5) but requires further monitoring before any conclusions can be reached. In view of

the number of different potentially zoonotic infections involved in fetopathy in sheep and goats, additional information on the frequency of these diagnoses in 2007 is illustrated below. Further information on scanning surveillance diagnoses and trends for endemic diseases is available from the Emerging Diseases and Welfare programme <http://www.vla.gov.uk/science/science-end-survrep-qtly.htm>



1.2 Recent reports from Regional Laboratories

This section summarises the main diagnoses and observations concerning zoonotic non-statutory diseases and infections shared between man and animals from submissions to Regional Laboratories (RLs) of the VLA during the period October to December 2007. It includes incidents that are not necessarily recorded in the VIDA table above and hence there may be some apparent discrepancies. See previous quarterly reports (1, 2, 3) for other incidents investigated in 2007. Further information is available in the reports by the VLA species groups <http://www.vla.gov.uk/science/science-end-survrep-qtly.htm> and the monthly surveillance reports in the Veterinary Record derived from the Emerging Diseases and Welfare programme

Cattle

Cryptosporidiosis was the most commonly identified pathogen in diarrhoeic neonatal calves. *Cryptosporidium* oocysts were also detected in older calves (eight weeks to six months old). Leptospirosis (probably *L. Icterohaemorrhagiae*) was implicated by PCR as the cause of sudden death of a three-week-old calf. Mycobacterial lymphadenitis was diagnosed in a dairy cow with multiple skin abscesses following histological examination of skin tissue. Louping ill was diagnosed in a suckler cow with ataxia and circling on a farm that had experienced significant losses from louping ill in sheep in 2006. *Campylobacter fetus fetus* abortion was confirmed in a dairy cow; *C. jejuni* was isolated from an aborted fetus. *Listeria monocytogenes* was diagnosed as the cause of bovine abortion on several occasions, usually associated with feeding poor quality silage; *L. innocua* was implicated in the abortion of a dairy cow. *Dermatophilus congolensis* was isolated from a group of suckler calves with skin lesions. Parapoxvirus was seen in a group of dairy cows with teat lesions. *Trichophyton verrucosum* ringworm occurred in a group of dairy cows with typical skin lesions.

Sheep and goats

Toxoplasmosis, *Chlamydophilia abortus*, listeriosis and *C. fetus fetus* were all identified as causes of abortion in early lambing flocks. Parapoxvirus (orf) continued to be a commonly diagnosed cause of skin lesions in young sheep and goats; concurrent infection with *D. congolensis* was demonstrated in a batch of lambs with particularly severe skin disease. *Corynebacterium pseudotuberculosis* (caseous lymphadenitis-CLA) was isolated from skin abscesses in sheep and goats. *L. monocytogenes* was isolated from the brains of two goats and from the intestines of a diarrhoeic ewe. Louping ill was diagnosed in a recently introduced ram in a hill flock.

Pigs

Outbreaks of *Streptococcus suis* type 2 meningitis and septicaemia were diagnosed in pigs from 10 days to 18 weeks old. *S. suis* type 3 was implicated with *Pasteurella multocida* as the cause of pneumonia in fattening pigs. Diseases due to *S. suis* serotypes 1, 7, 9 and 15 were also diagnosed. *Streptococcus dysgalactiae* subsp. *equisimilis* was isolated from joint, liver and heart valves of a gilt with vegetative endocarditis. *Erysipelothrix rhusiopathiae* was cultured from the joints of fattening pigs with proliferative synovitis and elsewhere implicated serologically as the cause of poor reproductive performance in sows. Cryptosporidiosis was an apparently incidental finding in the ileum of a weaner pig which was losing condition due to PCV-2 infection.

Birds

E. rhusiopathiae septicaemia was encountered in turkey poults on several units, usually presenting with sudden death. Avian tuberculosis caused the death of five adult Ring Teal ducks with enlarged mottled livers and creamy white nodules in the intestinal walls. Respiratory disease in a 12 week old Maran hen was attributed to *P. multocida* infection.

Miscellaneous other species and wildlife

Mycobacterium microti was isolated from a thin alpaca with tuberculous-like lesions at necropsy. *Yersinia pseudotuberculosis* was isolated from abscesses in the lungs, liver and spleen of a feral pigeon and *Y. pseudotuberculosis* was implicated as the cause of death of a red deer calf – one of three which had died after housing. *Y. enterocolitica* was isolated from the faeces of a three-year-old waterbuck (*Kobus ellipsiprymnus*) which succumbed to tuberculosis (*M. bovis*). 'Alpaca fever' (*S. equi* subsp. *zooepidemicus*) was confirmed in a diarrhoeic alpaca yearling.

2. Specific scanning and targeted surveillance and investigations

2.1 Campylobacter

The Food and Environmental Safety (FES) department at VLA Weybridge is responsible for the confirmation and speciation of campylobacters and other related potentially zoonotic organisms submitted via various routes, including VLA Regional Laboratories and private laboratories. The findings for 2007 are summarised here.

In 2007, 299 (84%) of 356 isolates submitted were from ovine and bovine abortions. Of the 50 bovine abortion cases, 18% were thermophilic campylobacters (compared with 29% in 2006); these included *C. jejuni* (5), *C. hyointestinalis* (1), and *C. sputorum bubulus* (3). Of the 249 ovine abortion cases, 11 percent (21% in 2006) were thermophilic campylobacters, including *C. jejuni* (15), *C. coli* (11) and *C. hyointestinalis* (1). The larger number of submissions in 2007 compared with 2006 appeared to mainly reflect an increase in ovine campylobacter abortions due to *C. fetus fetus*, with a relative fall in the number of abortions due to *C. jejuni/coli*. Isolates (probably commensals) were also obtained from a bongo, crane and cat; 12 *Arcobacter* campylobacters were identified from pigs samples.

Risk factors involved in the carriage of *C. jejuni* and *C. coli* in young cattle from a cross-sectional study of 56 farms were explored using previously collected data and a paper (Ellis-Iversen and others) has been submitted for publication. VLA provided consultancy to DG Sanco, EFSA and the Campylobacter CRL to support the development and implementation of the EC baseline survey of the prevalence of colonisation in European broiler flocks.

2.2 Cryptosporidium

2.2.1 Outbreak investigations

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 2007.

2.2.2 Survey of Cryptosporidium in pigs

The recent Defra funded OZ0407 project (Evaluation and risk assessment of the zoonotic transmission of Cryptosporidium) revealed a high prevalence of oocyst shedding in pigs. A follow-up study was subsequently undertaken in East Anglia in 2007 to assess the potential zoonotic hazard from pigs using submissions to VLA Bury St Edmunds for general disease diagnosis and Zoonoses Action Plan (ZAP) salmonella investigations. Cryptosporidium oocysts were detected by a sensitive fluorescent antibody test in 119 (38.6 %) of 308 faecal samples, with the peak prevalence at about nine weeks of age. Most oocysts examined were classified by molecular typing and confirmatory sequencing as Cryptosporidium pig genotype II, which is not thought to be of zoonotic significance. *C. parvum*, which is an important zoonotic pathogen, and *C. suis* (formerly pig genotype I), were identified in a few samples. Preliminary findings from the study are in broad agreement with published literature and suggest that Cryptosporidium in pigs does not constitute a major zoonotic hazard.

2.3. Escherichia coli

2.3.1 VTEC O157 outbreak Investigations

VTEC O157 outbreak investigations are undertaken at the request of CsCDC or HPA/NPHS (under a MoU) and variously involve collaboration with other organisations, including the Environmental Health departments of Local Authorities and the Health and Safety Executive. They are undertaken according to formal VLA guidelines. Determination of phage type (PT), Vero cytotoxin (VT) type and comparison of human and animal isolates by pulsed field gel electrophoresis (PFGE) are performed by the *E. coli*/Shigella/Yersinia/Vibrio Reference Unit of the Laboratory of Enteric Pathogens, HPA Centre for Infections, Colindale. Investigations undertaken in 2007 are summarised below.

| Outbreak reference | Month | History | Main findings |
|---|---------|--|--|
| Bury VTEC 01/07 HPA: East of England | April | Open farm investigated for possible link to small outbreak (two families). | <i>E. coli</i> O157 was isolated from 17 (20.5%) of 83 faecal samples. Most positives (14) were from sheep, including lambs that had been bottle-fed by visitors (probable source). ^a VTEC O157 PT2 VT2+ was confirmed in ewes and lambs, an adult pig and 4-6 month old calves. |
| Preston VTEC 01/07 (farm 1 - visited by VLA Preston) HPA: North West | October | Open farm investigated for possible link to an outbreak (six cases). | <i>E. coli</i> O157 was isolated from 16 (24%) of 66 faecal samples from animals. Positive samples were from sheep (10), cattle (3), horses (2) and goats (1). VTEC O157 PT38 VT2+ was isolated from each of these species. The PT differed from human cases and the premises were eliminated as the source. |

| | | | |
|--|---------|--|---|
| Preston VTEC 01/07 (farm 2 - visited by VLA Shrewsbury) HPA: North West | October | Small commercial cattle farm investigated as a possible source for the outbreak above. | <i>E. coli</i> O157 was isolated from seven (24%) of 29 animal faecal samples. Positive samples were obtained from calves and their environment (5) and from faeces of two farm dogs ^b . All seven isolates were identified as ^a VTEC O157 PT21/28 VT2+. |
|--|---------|--|---|

^aindistinguishable PFGE profiles found in animals and human cases

^bVTEC O157 in farm dogs: the farm dogs were thought to be the probable source of infection for the Preston VTEC 01/07 outbreak because of their close contact with the index case and with infected cattle. The dogs were individually resampled on two further occasions: VTEC O157 was not isolated again from either dog although sorbitol fermenting VT-negative *E. coli* O157 was coincidentally isolated from one dog on both occasions. VTEC O157 has previously been reported in dogs in association with human cases. However, it appears to be an uncommon occurrence and probably reflects temporary carriage and shedding following contact with cattle.

No further incidents involving sorbitol fermenting strains of VTEC O157 were investigated in 2007 but various laboratory approaches for the detection of SF+ colonies in animal samples were evaluated to aid preparedness.

2.3.2 Enhanced *E. coli* Surveillance

A scheme for enhancing surveillance of *E. coli* from diagnostic submissions to RLs was introduced in 2005 to detect new and emerging strains of potential zoonotic importance and those associated with disease in animals. It utilises standardised case definitions, colony selection criteria and extended serotyping plus Verocell assay, Multiplex PCR and Real Time PCRs to determine the following virulence factors: Vero cytotoxins (VT), eae (intimin), cytotoxic necrotising factor (CNF), cytolethal distending toxin (CLDT), heat-stable toxin (Stx), heat-labile toxin (LT), and fimbrial adhesions. Findings are entered onto a dedicated database (Ecotest) to facilitate surveillance and monitor trends over time. Antimicrobial sensitivity testing of the isolates to detect extended-spectrum beta-lactamase (ESBL) enzymes is included under Project FZ2200.

A total of 361 *E. coli* isolates were examined during 2007. Of the 347 isolates tested from animal endemic disease submissions, virulence factors with zoonotic potential were detected as follows: 5 (1.4%) were VT1+ and eae positive, 2 (0.6%) were VT1+, VT2+ and eae positive, 1 (0.3%) was VT1+ and VT2+, 2 (0.6%) were VT1+ only, 4 (1.2%) were VT2+ only and 24 (6.9%) were eae positive only. Overall, 14 (4.0%) of the 347 isolates from clinical disease cases in animals were VT+ compared with 20 (5.3%) of the 374 isolates examined in 2006 and 12 (5.7%) of the 210 isolates examined in 2005. The VTECs were isolated from cattle, sheep, goat and pigs. Twelve isolates (3.5%) contained the cytotoxic necrotizing factor (CNF) which was isolated from cattle, sheep/goats, pigs and other species. This compared with sixteen isolates (4.3%) in 2006.

| Species | VT1+ and eae | VT1+, VT2+ and eae | VT1+ and VT2+ | VT1+ only | VT2+ only | eae only |
|-------------|--------------------------|--------------------|---------------|-----------|----------------------|---|
| Cattle | O26 (2), O45, O103, O118 | O26 (2) | | | | Untypable, O26 (5), O80, O138, O153, O177 (2) |
| Pigs | | | | | O2, O138, O139, O180 | Untypable (2), Rough, O98, O103 (2) |
| Sheep/goats | | | O91 | O65, O174 | | O70, O145 |
| Avian | | | | | | O103 (3), O123, O181 |

2.4 Giardia

A collaborative project involving VLA Preston, HPA, local human microbiology laboratories and the University of Liverpool was initiated to explore an increase in human cases of giardiasis noted in the region. Human giardiasis has received relatively little public health attention in the past although case control studies in the UK have identified contact with animals, recreational fresh water and consumption of tap water (as well as travel to areas in countries where the hygiene facilities are poor), as risk factors. This present study investigates the possibility of a zoonotic source by comparing genetic types from animal and human faecal specimens in the North West of England and by identifying risk factors for human disease by case questionnaire. Over a 12 month period, VLA Preston expect to supply around 500-600 samples from farm animals in the region. The study may also yield useful information regarding the potential role of giardia in intestinal disease of livestock.

2.5 Leptospirosis

Targeted surveillance for leptospirosis is achieved by analysis of results from: (1) RT-PCR for pathogenic leptospires on appropriate diagnostic samples and sequencing and denaturing high pressure liquid chromatography (DHPLC) to further classify positives; (2) Antibody testing by microscopic agglutination test (MAT) 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. Hardjobovis* in cattle); (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) A total of 790 specimens from a range of mammalian species (mainly cattle and pigs - fetal kidneys) were examined by RT-PCR for pathogenic leptospires during 2007. Nine (1.5%) of the 621 samples suitable for testing, were positive; these comprised cattle (7), horse (1) and fox (1). The seven positive cattle submissions represented 1.5% of the 494 bovine samples compared with only 0.2% in 2006 (although there were 2.0% in 2005). A review of all PCR positive cases since the test was first introduced in 2005 is currently underway.

(2) 13,429 serum samples from a range of species were examined during 2007. Of 7041 canine sera, 34.9% and 8.2% were positive to *L. Canicola* and *L. Icterohaemorrhagiae* respectively, compared to 43.7% and 12.6% for 2006; and 29.3% and 9.4% in 2005. Of 5222 bovine samples examined for *L. Hardjo bovis*, 31.7% were positive compared with 29.6% in 2006 and 29.3% in 2005. Of 762 porcine samples tested, 19.9% were positive to *L. Bratislava* (32.9% in 2006 and 19.5% in 2005). Other significant serovars noted in 2007 included three dogs positive to *L. Bratislava*, 12 horses positive to *L. Bratislava* and six horses positive to *L. Icterohaemorrhagiae*.

(3) Bulk milk antibody test results for *L. Hardjo* showed little change compared with the previous year. During 2007, 538 (30.5 %) of 1764 tests undertaken for monitoring purposes were negative, 250 (14.2 %) were low positive, 238 (13.5%) were mid positive and 738 (41.9%) were high positive. In 2006 the comparable figures (1778 tests) were 31.9% negative, 12.5% low positive, 11.00 % mid positive and 44.5% high positive. These findings indicate serological evidence of potentially active infection (or extensive vaccination) in about 55% of dairy herds from the population submitting samples. Although vaccination complicates interpretation, it is thought unlikely that many vaccinated herds would undertake milk antibody testing. See further comments about leptospirosis in cattle at 1.1.

2.6 Mycobacteria (excluding *M. bovis*)

Since *Mycobacterium bovis* became notifiable in all species in 2006, the number of samples examined by VLA Weybridge has increased, particularly from pets and camelids; samples from pigs are mainly submitted by meat inspectors. Excluding *M. bovis*, potentially zoonotic non-statutory mycobacteria were identified during 2007 as summarised below (to 24/01/08). The data were obtained from Defra funded projects SB4510 and SB4300.

M. avium was isolated from cattle (19), pigs (6), red deer (16), sheep (1), cats (3), dogs (2), wild red deer (1) and pudu (1). *M. microti* was isolated from alpaca (2) and cats (19). Other isolates were *M. kansasii* from cattle (3), *M. fortuitum* from cats (2) and a dog (1); unclassified mycobacteria were isolated from cattle (8), cats (2) and wild red deer (1).

2.7 *Streptococcus suis*

Streptococcus suis isolates from diagnostic material submitted to RLs are typed further for disease surveillance purposes. The numbers and serotypes from porcine diagnostic material submitted to RLs during 2007 are shown below with data for previous years for comparison.

| Year | 1 | 2 | 3 | 4 | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 | 25 | 31 | 33 | 1/2 | UT | Totals |
|------|----|----|----|----|---|---|---|----|----|----|----|----|----|----|----|-----|----|--------|
| 2004 | 7 | 51 | 16 | 7 | 3 | 7 | | 1 | | 6 | 3 | 1 | 2 | | | | 5 | 109 |
| 2005 | 10 | 50 | 9 | 10 | 3 | 2 | | | | | | | | 1 | 1 | | 5 | 91 |
| 2006 | 8 | 42 | 5 | 6 | 1 | 1 | 1 | | 2 | 1 | 1 | | | 1 | 1 | 2 | 1 | 73 |
| 2007 | 6 | 54 | 15 | 3 | 6 | 1 | 6 | 1 | | | 2 | 1 | | 1 | | 3 | 5 | 104 |

The following serotypes were not isolated: 5, 6, 11, 13, 17-24, 26 - 30, 34 - 35. *S. suis* 2 was again the predominant strain.

S. suis 25 (supported by 16S typing) was identified in lung lesions from calves in three unrelated incidents in different regions of England during 2007; histological findings suggested that the organism was not involved in the disease process.

2.8 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 VLA on sera submitted to RLs: the findings presented below provide an overview of the serological status of samples submitted for diagnosis, monitoring and screening purposes 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 in 2007, 228 (44%) of 649 sera tested (from 149 separate submissions) were positive for *T. gondii* compared with 197 (46%) of 428 sera (113 submissions) in 2006. In goats, 18 (47%) of 38 sera (10 submissions) were positive in 2007 compared with 3 (16%) of 19 sera (5 submissions) in 2006. No pig sera were examined in 2006 but in 2007, 3 (6%) of 54 sera (7 submissions) were positive. There was also serological evidence of infection in an alpaca in 2007.

Note: in addition to confirmed VIDA diagnoses of toxoplasmosis in sheep and goats listed in 1.1, toxoplasma tachyzoites were detected by immunohistochemistry in a wallaby in 2007 (See Misc. column in 1.1). Similar diagnoses during the period 1999-2006 were made in cats (4), wallabies (1), dogs (1) and other mammals (3).

2.9 *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 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 January and December 2007, a total of 12209 individual samples (from 3540 submissions) were received by VLA for testing in pools each consisting of up to three different submissions. There were 312 equine submissions, 2676 from boars/sows and 552 from wild boar. All tests gave negative results.

2.10 Q fever (*Coxiella burnetii*)

There was increased interest in Q fever in 2007 in the wake of the large outbreak affecting workers in a meat processing plant in Stirlingshire in 2006. VLA assisted the HPA with the retrospective investigation of a human outbreak (about 30 cases) of Q fever (*Coxiella burnetii*) in the Cheltenham area in 2007. The source of the

infection was not apparent but one possibility was windborne transmission from local livestock premises and this was investigated by a telephone survey of local farms identified by HPA from prevailing wind direction (data obtained from the Met Office). The survey assessed whether any husbandry risk practices (particularly relating to parturition and handling of potentially contaminated bedding material) may have been adopted during the period (late April/early May 2007) when cases appeared to have acquired infection. The findings are still being evaluated. A veterinary surveillance project is currently underway in an infected goat herd and a PCR for Q fever and other initiatives are under development.

3. Publications

The publications in 2007 listed below (including those accepted for publication) were partly or completely funded by FZ2100.

Arnold, M.E., Ellis-Iversen, J., Cook, J.C., Davies, R.H., McLaren, I.M., Kay, A.C.S & Pritchard, G.C (2008) Investigation into the effectiveness of pooled fecal samples for detection of verocytotoxin-producing *Escherichia coli* O157 in cattle. *Journal of Veterinary Diagnostic Investigation* **20**, 21-27

Blaser, M.J., Newell, D. G., Thompson, S. & Zechner, E. L. Pathogenesis of *Campylobacter fetus* infections. In *Campylobacter* 3rd Edition, ASM Press (In press)

Garenaux, A., Lucchetti-Miganeh, C., Barloy-Hubler, F., Ermel G., Federighi, M., Tresse, O., Guillou, S., de Jonge, R., Payot, S., Newell, D & Ritz, M. (2007) Parallel between *Campylobacter jejuni* Genome Sequence Study and Physiology. In: *New Developments in Food Microbiology Research* Eds: Michael C. Berger, Nova Science Publishers, Hauppauge, NY

Gaudie, C.M., Featherstone, C.A., Phillips, W.S., McNaught, R., Rhodes, P., Errington, J., Fearnley, C., Fenner, J.S & Pritchard, G.C. *Leptospira interrogans* Icterohaemorrhagiae infection (Weil's disease) acquired from pet rats. *Veterinary Record* (In press).

Giles, M, Chalmers, R.M., Pritchard, G.C., Elwin, K., Mueller-Doblies, D. & Clifton-Hadley, F. *Cryptosporidium hominis* in a goat and sheep in the UK. *Veterinary Record* (In press)

Ilknur Aktan, I, La Ragione, R.M., Pritchard, G.C & Woodward, M.J. (2007) Prevalence of attaching and effacing *E. coli* serogroup O103 in orphan lambs on an open farm in Eastern England. *Veterinary Record* **161**, 386-387

Jaap, A. Wagenaar, W., Jacobs, R, Hofshagen, M & Newell, D. Poultry colonization with *Campylobacters* and its control at the primary production level. In *Campylobacter* 3rd Edition, ASM Press (In press)

Mafura, M., Wu, G., Best, E., Pritchard, G., Woodward, M & Anjum, M (2007) Virulotyping *Escherichia coli* of veterinary origin to assess the link between virulence profiles and pathotypes. Med-Vet-Net 2007 conference, Lucca, Italy (Poster).

Ogden, D., MacRae, M., Johnston, M., Cody, A, Strachan, N. & Newell, D.G (2007) Genotyping of *Campylobacter* strains supports drinking water as a source of infection in broilers. *Applied Environmental Microbiology* **73** (16):5125-9.

Phillips, W., McNaught, R., Chambers, J., Rhodes, P., Gaudie, C., Featherstone, C., Errington, J., Fenner, J & Pritchard, G (2007) A case of human leptospirosis linked to pet rats. HPA Conference, Warwick, September 2007 (Poster)

Pritchard, G.C., Marshall, J.A., Giles, M., Chalmers, R.M & Marshall, R.N. (2007) *Cryptosporidium parvum* infection in orphan lambs on a farm open to the public. *Veterinary Record*, **161**, 11-14

Pritchard, G., Marshall, J., Giles, M., Mueller-Doblies, D., Sayers, R., Marshall, R & Chalmers, R (2007) Sub-clinical *Cryptosporidium parvum* infection in lambs - an underestimated zoonotic hazard? International zoonoses conference, Glasgow, November 2007 (Poster)

Pritchard, G.C., Marshall, J., Giles, M., Mueller-Doblies, D., Sayers, A. R., Marshall, R. N., Elwin, K & Chalmers, R.M. Survey of *Cryptosporidium* in lambs submitted for diagnostic necropsy in England and Wales
Veterinary Record (In press)