

WILDLIFE DISEASES IN THE UK



CASES REPORTED IN THE YEAR 2002

REPORT TO
THE DEPARTMENT OF ENVIRONMENT, FOOD AND RURAL AFFAIRS
(Defra)
AND THE
OFFICE INTERNATIONAL DES EPIZOOTIES (OIE)

SVS Project ED1600-Diseases of Wildlife

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Cover picture: Avian botulism in gulls. Avian botulism in wild birds is caused by Clostridium botulinum, usually toxin type C, which produces a progressive flaccid paralysis with limbs, wings and later neck and head becoming flaccid or floppy. Examination of live birds is important as diagnosis is usually clinical. The bird photographed in the hand, could not raise its head, wings or tail, while those on the grass were ataxic and almost immobile. Avian botulism is not uncommon in the UK (see cases 02/55,56,60, tables 17 and 18), in a range of species. It may occur in any month and the toxin is usually assumed to be present in contaminated water. Most mammalian cases of botulism result from type C and D toxins. It is generally accepted that humans are resistant to type C and D botulism.

WILDLIFE DISEASES IN THE UK 2002

Report to Defra and to the OIE 2002

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INTRODUCTION

1. The Wildlife Diseases Report for the year 2002, to Defra, and ultimately to the OIE is compiled as an objective of Project ED1600 and follows the same format as in the previous 7 years. This report is a summary of diseases in free-living animals and wildlife investigated by government and non-government agencies, and independent workers, for the year 2002, together with some 2001 incidents that were not reported previously. The absence of a particular condition does not necessarily mean that it was not present.
2. Each incident has been numbered to allow for referencing. The majority referred to infectious diseases, however a few non-infectious incidents that were considered worthy of note have been added. Some selected conditions, not recorded in previous UK OIE Reports, have been annotated by the letter ' N '. The data that has been contributed by investigators is gratefully acknowledged.
3. Further to the key aims of both Defra and VLA with respect to wildlife, Defra now supports a surveillance Project for wildlife disease surveillance in England and Wales which allows investigation by VLA of wildlife mortality, particularly where zoonotic, notifiable or new and emerging disease may be involved and where mass mortality incidents occur. Data from several Project investigations in 2002 are presented in the lists and the tables of this Report including West Nile Virus surveillance in wild birds.
4. Two particularly noteworthy incidents in 2002 were an epidemic of Phocine Distemper Virus (PDV) infection in UK seals and European Bat Lyssa (EBL) virus infection. Surveillance data from both diseases are given on page 15. EBL was isolated from a Daubenton's bat and, in a second unrelated incident, the tragic death of a bat worker from the same disease may have been acquired following a bite from an infected bat.

OIE REPORT ON WILDLIFE DISEASES, 2002 - OIE LIST 'A' DISEASES

INCIDENT NO	SPECIES AFFECTED	DISEASE	LOCALITY	REPORTED MORTALITY	COMMENT
02/1	Knot (<i>Calidris canutus</i>)	Avian Influenza virus sub type H9N9 infection	E. England	No reported mortality	Virus isolation from cloacal swab

OIE REPORT ON WILDLIFE DISEASES, 2001 - OIE LIST 'B' DISEASES

INCIDENT NO	SPECIES AFFECTED	DISEASE	LOCALITY	REPORTED MORTALITY	COMMENT
NOTE Other list B diseases in mammals and birds are given in Tables 14a, 14b and 14c.					
NOTE Atypical <i>Brucella spp.</i> in marine mammals are given on Table 7, Page 16. These isolates do not conform, using classical techniques, to the recognised species of <i>Brucella</i>.					
02/2	Badger (<i>Meles meles</i>)	<i>Mycobacterium bovis</i> infection in suspect poisoning case	W. England	1	Necropsy and microbiology, including culture
/3	Badger	<i>Mycobacterium bovis</i> infection in suspect poisoning case	Wales	1	Necropsy and microbiology, including culture
/4	Rabbit (<i>Oryctolagus cuniculus</i>)	Myxomatosis	English midlands	approx. 10	Clinical history, several locations during year
/5	Rabbit	Myxomatosis	S. England Results from Wildlife Hospital	72	Clinical history, several locations during year
/6	Rabbit	Myxomatosis	N. England	12	Clinical history
BIRDS					
Fowl cholera (<i>Pasteurella multocida</i>) infections, Page 23					
/7	Greylag goose (<i>Anser anser</i>) Mallard (<i>Anas platyrhynchos</i>) Gadwall (<i>Anas strepera</i>) Pochard (<i>Aythya ferina</i>) Coot (<i>Fulica atra</i>) Moorhen (<i>Gallinula chloropus</i>)	Avian tuberculosis	W. England	14, combined total	Necropsy and microbiology. Through the year at one reserve

OIE REPORT ON WILDLIFE DISEASES, 2001 - OIE LIST 'B' DISEASES

INCIDENT NO	SPECIES AFFECTED	DISEASE	LOCALITY	REPORTED MORTALITY	COMMENT
BIRDS					
02/8	Whooper Swan (<i>Cygnus cygnus</i>)	Avian tuberculosis	N. England	3	Necropsy and microbiology
/9	Mute Swan, Mallard, Shelduck (<i>Tadorna tadorna</i>)	Duck virus enteritis	W. England	6, combined total	Necropsy. Disease occurs annually at this location
/10	Wood Pigeon (<i>Columba palumbus</i>)	Avian tuberculosis	Scotland	1	Necropsy and microbiology
/11	Collared dove	Paramyxovirus 1 infection	S. England	2	Histopathology and virology
/12	Feral pigeon	Paramyxovirus 1 infection	Scotland	4	Necropsy, histopathology and virology
/13	Feral pigeon	Paramyxovirus 1 infection	N. England	1	Necropsy, and virology
/14	Feral pigeon	Paramyxovirus 1 infection	E. England	1	Necropsy, and virology
/15 N	Blue tit (<i>Parus caeruleus</i>)	<i>Chlamydophila</i> infection – clinical significance unclear	Scotland	1	Necropsy and <i>Chlamydophila</i> demonstration by PCR

Footnote

N indicates selected diseases that are new (not reported previously) to the UK OIE Report; indicating a new pathogen, new host species or a previously unreported disease.

Mycobacterium bovis infections in UK wildlife, 2002

Data supplied by VLA Weybridge

Table B1 Examinations of RTA (Road Traffic Accident) Badgers, England, 2002

RTA badgers collected in 2002 (suitable for post-mortem)	623
Number of above cultured so far	452
Number of above <i>M. bovis</i> positive	48

Table B2 Results of an intensive field study of *M. bovis* infection in badgers carried out in Gloucestershire, England.

Data supplied by the Central Science Laboratory

Badger, live-capture results

Badgers

Negative	133
Elisa positive only (serology)	42
Culture positive	14

Culture results represent microbiological culture of clinical samples (i.e. sputum, faeces, urine or swabs of wounds and abscesses)

Badger post-mortem results

Negative	17
Elisa positive only	5
Culture positive	1

Culture results represent microbiological culture of tissue samples.

Mycobacterium bovis infections in UK wildlife, 2002

Table B3 Wildlife species (cadavers) from South West England examined for *M. bovis* infection – excluding badgers
Data supplied by the Central Science Laboratory
 (See reference 6)

Cadavers examined during 2002			
		Negative	Positive
Brown hare (<i>Lepus europaeus</i>)		3	0
Brown rat (<i>Rattus norvegicus</i>)		130	0
Common shrew (<i>Sorex araneus</i>)		1	0
Fallow deer (<i>Dama dama</i>)		100	3
Feral ferret (<i>Mustela putorius</i>)		4	0
Feral sheep (<i>Ovis</i>)		2	0
Fox (<i>Vulpes vulpes</i>)		164	3
Grey squirrel (<i>Scurius carolinensis</i>)		242	0
Hedgehog (<i>Erinaceus europaeus</i>)		16	0
House mouse (<i>Mus musculus</i>)		2	0
Mink (<i>Mustela vison</i>)		12	0
Mole (<i>Talpa europaea</i>)		46	0
Muntjac (<i>Muntiacus reevesi</i>)		23	0
Polecat (<i>Mustela putorius</i>)		3	0
Pygmy shrew (<i>Sorex minutes</i>)		1	0
Rabbit (<i>Oryctolagus cuniculus</i>)		193	0
Red deer (<i>Cervus elaphus</i>)		27	0
Roe deer (<i>Capreolus capreolus</i>)		321	2
Stoat (<i>Mustela erminea</i>)		33	0
Water vole (<i>Arvicola terrestris</i>)		3	0
Weasel (<i>Mustela nivalis</i>)		20	0
Wood mouse (<i>Apodemus sylvaticus</i>)		5	0
Yellow-necked mouse (<i>A. flavicollis</i>)		1	0

OIE REPORT ON WILDLIFE DISEASES, 2001 - WILDLIFE DISEASE LIST

INCIDENT NO	SPECIES AFFECTED	DISEASE	LOCALITY	REPORTED MORTALITY	COMMENT
<u>MAMMALS</u>					
02/16	Fox (<i>Vulpes vulpes</i>)	Rupture of sub-pleural abscess	S. England	1	Necropsy
/17	Fox	Ruptured liver	S. England	1	Necropsy
/18	Fox	Peritonitis	S. England	1	Necropsy
/19	Fox	Starvation	Wales	1	Necropsy
/20	Fox	Fox mange	S. England	1	Clinical history
/21	Badger	Pyothorax due to <i>Pasteurella multocida</i> infection. No tuberculous lesions	English Midlands	1	Necropsy and microbiology. <i>P. multocida</i> is a common contaminant of bite wounds
/22	Otter (<i>Lutra lutra</i>)	<i>Streptococcus dysgalactiae</i> infection. Cause of death not known. Separate incidents	S. England	2 2 incidents	Bacteriology on (1) lung abscess swab and (2) wound swab
/23 N	Fallow deer (<i>Dama dama</i>) Park deer	Blepharoconjunctivitis in weaned fawns. Problem has recurred in each of the last 5 years.	E. England	5-10 % of weaned fawns	Microbiology – still in progress. <i>Chlamyidophila</i> suspected
/24	Rabbit	<i>E. coli</i> 0157 infection	E. England	4 infected. All clinically normal	Bacteriology. Part of on-going investigation, Ref. 25
/25	Brown hare (<i>Lepus europeus</i>)	Suspected leporine dysautonomia	E. England	1	Necropsy and histopathology
/26	Grey squirrel (<i>Sciurus carolinensis</i>)	Shot. Ulcerative dermatitis with ringworm (<i>Trichophyton terrestre</i> or <i>T. erinacei</i>) and staphylococcal infections.	N. England	1	Necropsy and microbiology. Dermatitis around nipples in lactating animal – ? offspring teeth wounds
/27	Hedgehog (<i>Erinaceus europaeus</i>)	Verminous pneumonia	E. England	1	Necropsy
/28	Hedgehog	Combined parasitic pneumonia and <i>Bordetella bronchiseptica</i> lung infection	E. England	12 affected, ill-thrift	Necropsy, bacteriology and histopathology
/29 N	Hedgehog	Nervous signs including circling, long clinical course	E. England	1 examined. Several similar cases reported in recent years	Cause not found. Necropsy and histopathology
/30	Hedgehog	<i>Salmonella enteritidis</i> phage type 11 infection. Diarrhoea.	E. England	1	Bacteriology.

OIE REPORT ON WILDLIFE DISEASES, 2001 - WILDLIFE DISEASE LIST

NCI-DENT NO	SPECIES AFFECTED	DISEASE	LOCALITY	REPORTED MORTALITY	COMMENT
<u>MARINE MAMMALS</u>					
02/31	Common Dolphin (<i>Delphinus delphis</i>)	Bycatch - entanglement in fishing nets. Separate incidents	S. England	10	Necropsy and microbiology
/32	Common Dolphin	Parasitic pneumonia – parasites not identified	S. England	1	Necropsy and microbiology
/33	Common Dolphin	Impacted fish bones in cardiac stomach	S. England	1	Necropsy and microbiology
/34	Common Dolphin	Hepatic abscess – not clear if cause of death	S. England	1	Necropsy and microbiology
/35	Common Dolphin.	Hepatopathy – fluke infestation	S. England	1	Necropsy and microbiology
/36	Common Dolphin	Parasitic gastro-enteritis	S. England	1	Necropsy and microbiology
/37	Common Dolphin	Orchitis and peritonitis	S. England	1	Necropsy and microbiology
/38	Striped dolphin (<i>Stenella coeruleoalba</i>) Striped dolphin	Malnutrition Aged animal	S. England S. England	1 1	Necropsy and microbiology Necropsy and microbiology
/39	Sowerbys beaked whale (<i>Mesoplodon bidens</i>)	Hepatopathy. Cause not given	S. England	1	Necropsy and microbiology
/40	Harbour porpoise <i>Phocoena phocoena</i>)	Bycatch - entanglement in fishing nets. Separate incidents x 7	S. England	7	Necropsy and microbiology
/41	Harbour porpoise	Bycatch and parasitic pneumonia	S. England	1	Necropsy and microbiology
/42	Harbour Porpoise	Bycatch. Parasitic pneumonia and <i>Salmonella typhimurium</i> 4,12:a. Separate incidents	S. England	2	Necropsy and microbiology
/43	Harbour porpoise	Parasitic pneumonia and <i>Salmonella typhimurium</i> 4,12:a. Separate incidents x 3	S. England	3	Necropsy and microbiology
/44	Harbour Porpoise	Parasitic pneumonia and hepatopathy	S. England	1	Necropsy and microbiology
/45	Harbour Porpoise	Helminthiasis. Parasites in tympanic bullae, parasitic pneumonia, trauma	S. England	1	Necropsy and microbiology
/46	Grey Seal (<i>Halichoerus grypus</i>)	Parasitic pneumonia	S. England	1	Clinical history and faecal parasitology

OIE REPORT ON WILDLIFE DISEASES, 2001 - WILDLIFE DISEASE LIST

INCIDENT NO	SPECIES AFFECTED	DISEASE	LOCALITY	REPORTED MORTALITY	COMMENT
<u>MARINE MAMMALS</u> Continued					
02/47	Grey Seal	Trauma, malnutrition, parasitic pneumonia, and parasitic gastroenteritis.	S. England	1	Necropsy
/48	Grey Seal pup	Trauma and navel infection	S. England	1	Necropsy
/49 N	Grey Seal	<i>Corynebacterium ulcerans</i> skin infection	S. England	1	Bacteriology from swab
/50 N	Grey Seal	<i>Streptococcus phocae</i> wound infection. Separate incidents	S. England	3	Bacteriology from swabs
/51	Grey Seal	<i>Arcanobacterium phocae</i> infection	S. England	1	Bacteriology from swab
/52	Grey Seal	Osteomyelitis, stomach impacted with feathers. <i>Brucella</i> sp. isolated from lung – no lesions	S. England	1	Necropsy and bacteriology
/53	Grey Seal	Phocine Distemper virus (PDV) infection? (results awaited). <i>Brucella</i> sp. isolated from kidney – no lesions	S. England	1	Necropsy and microbiology
/54	Grey Seal	Phocine Distemper virus (PDV) infection? (results awaited). <i>Bordetella bronchiseptica</i> pneumonia, trauma	S. England	1	Necropsy and microbiology

OIE REPORT ON WILDLIFE DISEASES, 2001 - WILDLIFE DISEASE LIST

INCIDENT NO	SPECIES AFFECTED	DISEASE	LOCALITY	REPORTED MORTALITY	COMMENT
<u>BIRDS</u>					
02/55	Mallard, Tufted duck (<i>Aythya fuligula</i>), Black headed gull (<i>Larus ridibundus</i>), Coot	Avian botulism	W. England.	26 birds seen to be affected	Clinical history, necropsy. Similar outbreak 2 years ago at this locality
/56	Black headed gulls	Suspected avian botulism	N. England	7 birds examined	Clinical history and necropsy
/57	Mute Swan (<i>Cygnus olor</i>)	Helminthiasis. <i>Acuaria uncinata</i> infestation	W. England	5 juvenile swans	Necropsy
/58	Mute Swan	Helminthiasis <i>Amidostomum anseris</i> infestation	W. England	3 juvenile swans	Necropsy
/59	Mute Swan	Lead poisoning	S. England	4 separate incidents	Necropsy and biochemistry
/60	Mute Swan	Suspected botulism	S. England	several	Clinical history and necropsy
/61 N	Mute Swan	Suspected viral encephalitis. Similar cases reported previously in S. England	E. England	8 1 examined	Necropsy, histopathology virology, including West Nile virus. No viruses isolated
/62	Mute Swan	As for previous case	S. England	1	As for previous case
/63	Whooper Swan (<i>Cygnus cygnus</i>)	Lead poisoning (gun shot ingestion)	Scotland	4	Necropsy
/64	Whooper Swan	Suspected protozoan encephalitis	N. England	1	Necropsy and histopathology
/65 N	Guillemot (<i>Uria aalge</i>) and Razorbill (<i>Alca torda</i>)	Oiled seabirds. Marine oil pollution incident.	N. England	70 birds washed up on coast. 3 examined	Necropsy
/66 N	Razorbill	Worms in air sacs (<i>Reighardia iomivae</i>)	S. England	1	Necropsy and microbiology
/67	Heron (<i>Ardea cinerea</i>)	Fox predation	N. England	1	Necropsy and history
/68 N	Tawny owl (<i>Strix aluco</i>)	<i>Streptobacillus moniliformis</i> infection in both feet	S. W. England	1	Necropsy and bacteriology. Infection probably from rat bite.
/69 N	Tawny owl	Corneal ulceration, blepharitis, uveitis and retinal lesions and detachment	S. England	47 of 61 adult birds and 6 of 14 juveniles with eye lesions	Reference 19 Ophthalmological exam. of live birds submitted to hospital.
/70	Tawny owl	Nephrosis	S. England	1	Reference 20 Histopathology. Cause unknown
/71	Red kite (<i>Milvus milvus</i>)	Starvation	Wales	2	Necropsy

OIE REPORT ON WILDLIFE DISEASES, 2001 - WILDLIFE DISEASE LIST

INCIDENT NO	SPECIES AFFECTED	DISEASE	LOCALITY	REPORTED MORTALITY	COMMENT
<u>BIRDS</u> Continued					
02/72	Sparrowhawk (<i>Accipiter nisus</i>)	Starvation	Wales	1	Necropsy
/73	Sparrowhawk and Song thrush (<i>Turdus philomelos</i>)	Trauma – hit window	Wales	1,1	Necropsy and history
/74	Buzzard (<i>Buteo buteo</i>)	Rabbit bone stuck in throat	Wales	1	Necropsy
/75	Buzzard	Severe oral trichomoniasis, emaciation	S. England	1	Necropsy, infection probably from avian prey
/76	Collared dove (<i>Streptopelia decaocto</i>), Wood Pigeon (<i>Columba palumbus</i>), Feral pigeon (<i>Columba livia</i>)	Trichomoniasis	W. England, all within a 5 km. area	13 36 8	Necropsy and microbiology. Part of a large die-off of wood pigeons and collared doves throughout S. England in autumn 2002.
/77	Collared dove	Trichomoniasis	N. England	5	Clinical history Significant mortality of collared doves and woodpigeons throughout S. England during autumn 2002 due to trichomoniasis
/78	Collared dove	Oral trichomoniasis	S. England	2	
/79	Collared dove	Sub-cutaneous haemorrhage in head region. Tick infestation	E. England	Several during the year. One examined	Necropsy and histopathology. Cause not found
/80	Dunnock (<i>Prunella modularis</i>)	Pox virus infection on toes. Same area as chaffinch incident below. Disease not causing death	W. England	Several	Histopathology of lesions
/81	Reed bunting (<i>Emberiza schoenicus</i>)	<i>Salmonella typhimurium</i> phage type 56 enteritis	S. England	1	Necropsy and microbiology
/82 N	Chaffinch (<i>Fringilla coelebs</i>)	Scaley leg mite infestation. Disease not causing death. Concurrent poxvirus infection affecting feet of birds in the area – possible combined infection of the two diseases in some individuals	W. England	25 ringed birds out of 137 caught	Identification of <i>Knemidocoptes</i> sp. mites. Problem for 3 years, no known association with domestic poultry
/83	Greenfinch (<i>Chloris chloris</i>)	Salmonellosis. <i>Salmonella</i> spp. and proventricular megabacteriosis	W. England	Several birds affected. 2 separate outbreaks	Necropsy and microbiology
/84	Greenfinch	<i>E.coli</i> 0138:K, verotoxin positive from lung, liver and intestine	English midlands	5 dead out of a group of 150	Necropsy and bacteriology on one bird
/85	Rook (<i>Corvus frugilegus</i>)	Helminthiasis Species not specified	Wales	1	Necropsy

OIE REPORT ON WILDLIFE DISEASES, 2001 - WILDLIFE DISEASE LIST

INCIDENT NO	SPECIES AFFECTED	DISEASE	LOCALITY	REPORTED MORTALITY	COMMENT
AMPHIBIANS					
02/86 N	Palmate newt (<i>Triturus helveticus</i>)	Parasitic cystic dermatitis mixed infestation, primarily ? <i>Dermosporidium</i> sp.	S. England. One pond only	Approx. 50 dead newts, and 50 others moribund	Necropsy and microbiology on 7. Previously unreported disease?
/87	Common toad (<i>Bufo bufo</i>)	Hind leg trauma thought to be caused by otter predation	N. England	Approx 40 affected animals found	Necropsy and clinical history. Otter spraint with toad bones
/88	Common toad	Hind leg trauma thought to be caused by otter predation	N. England	Approx 10 affected animals found	Necropsy and clinical history. Otter spraint with toad bones

Table 4

West Nile Virus (WNV) surveillance in wild birds and free-living game birds 2001, 2002
England, Wales and Scotland

2001

Number of Wild Birds Examined	Number of Species	Results of Brain Histopathology	Virus Isolation For WNV	WNV PCR
80	19	No viral encephalitis	All negative	Not done

2002

Number of Wild Birds Examined	Number of Species	Results of Brain Histopath	Virus Isolation For WNV	WNV PCR
235 (22 game birds)	54 (including 6 crow species)	10* birds with brain lesions	All negative or pending	20 negative 0 positive

NOTES

1. * 10 birds with brain lesions –

Encephalitis in 2 pigeons - paramyxovirus isolated in both
 Non-suppurative encephalitis in 2 mute swans - no viruses isolated. Incidents 02/60 and 61
 Encephalitis in pheasants - reovirus isolated - clinical significance unknown
 Purulent meningitis, rook - bacterial infection
 Encephalitis - starling - thought to be protozoal - see **Reference 27**
 Acute purulent encephalitis - house sparrow - bacterial infection
 Acute purulent encephalitis - magpie - bacterial infection
 Cerebral abscess - carrion crow - bacterial infection

2. Examinations are part of the VLA, Monitoring Diseases of Wildlife Project, ED1600

3. Diagnostic data from some of the birds examined appears in the Wildlife List.

4. Data from free-range poultry and captive birds kept in outside aviaries not shown

No evidence of West Nile virus infection has been found from VLA surveillance. to date

4. The help of Scottish Agricultural College, , RSPB, BTO and RSPCA Wildlife Hospitals is gratefully acknowledged

SURVEYS

Table 5 **2002 Rabies Surveillance – Free-Living Species**
Data supplied by Rabies Unit, VLA Weybridge

SPECIES	NUMBER EXAMINED	LOCALITY	TEST	RESULT
Fox (<i>Vulpes vulpes</i>)	1	UK	Rabies FAT on brain smears and RT-PCR	Negative
Bats – species identification in next Report	213	UK	Rabies FAT on brain smears and RT-PCR	Negative x 212 Positive x 1, - a juvenile Daubenton's bat (<i>Myotis daubentonii</i>), also tested by RTCIT and MIT. Refs. 21,22

Table 6 **Phocine Distemper virus (PDV) 2002**

Seal mortality reported up to the end of October 2002

Compiled by VLA Truro, from data sourced from the Sea Mammal Research Unit and the Zoological Society of London

England	Number of animals
Total dead seals	2547
Total confirmed PDV cases	38
Total Common seals	37
Total Grey seals	1
Scotland	
Total dead seals	274
Total confirmed PDV cases	8
Total Common seals	6
Total Grey seals	2
Wales	
Total dead seals	105
Total confirmed PDV cases	0
Northern Ireland	
Total dead seals	54
Total confirmed PDV cases	2
Total Common seals	2
Total Grey seals	0
Total October 2002	2980

Table 7. Brucella Isolates and Serology Results from Marine Mammals
Data supplied by VLA Weybridge

Note 1: These isolates are atypical *Brucella spp.* and do not conform, using classical techniques, to the recognised species of *Brucella* (e.g. *B abortus*, *B melitensis*, *B ovis*, *B suis*).

Note 2: Samples received from GB only. (More have been received from abroad)

Atypical *Brucella spp.* culture isolates received at VLA Weybridge during 2002

SPECIES AFFECTED	DISEASE	LOCALITY	NUMBERS AFFECTED	METHOD OF DIAGNOSIS
Common seal (<i>Phoca vitulina</i>)	Brucellosis	Inverness, Scotland (SAC)	4	Culture and PCR
Striped dolphin (<i>Stenella coeruleoalba</i>)	Brucellosis	Inverness, Scotland (SAC)	2	Culture and PCR
Harbour porpoise (<i>Phocoena phocoena</i>)	Brucellosis	Inverness, Scotland (SAC)	2	Culture and PCR
Unidentified seal	Brucellosis	Veterinary Science Division (Northern Ireland)	1	Culture and PCR

Table 7B Brucellosis in Marine Mammals

Serum samples received at VLA Weybridge during 2002 for *Brucella* ELISA serology:-

WILDLIFE SPECIES AFFECTED	TOTAL SUBMITTED	TOTAL POSITIVE	TOTAL NEGATIVE	COUNTY LOCATION (SENDER)
Common dolphin (<i>Delphinus delphis</i>)	59	7	52	VLA Truro
Common dolphin	2	0	2	Inverness, Scotland (SAC)
Harbour porpoise (<i>Phocoena phocoena</i>)	46	7	39	VLA Truro
Harbour porpoise	8	1	7	Inverness, Scotland (SAC)
Otter (<i>Lutra lutra</i>)	6	0	6	Inverness, Scotland (SAC)
Otter N	18	1	17	VLA Truro
Common seal (<i>Phoca vitulina</i>)	2	0	2	Inverness, Scotland (SAC)
Common seal	2	0	2	VLA Truro
Common seal	1	0	1	VLA Thirsk
Striped dolphin (<i>Stenella coeruleoalba</i>)	4	0	4	Inverness, Scotland (SAC)
Striped dolphin	6	1	5	VLA Truro
White-beaked dolphin (<i>Lagenorhynchus albirostris</i>)	3	0	3	Inverness, Scotland (SAC)
White-beaked dolphin	1	0	1	VLA Truro
Atlantic White-sided dolphin (<i>Lagenorhynchus actus</i>)	1	0	1	VLA Truro
Sowerby's beaked whale (<i>Mesoplodon bidens</i>)	1	0	1	Inverness, Scotland (SAC)
Sowerby's beaked whale	1	0	1	VLA Truro
Bottlenose dolphin (<i>Tursiops truncatus</i>)	1	0	1	Inverness, Scotland (SAC)
Grey seal (<i>Halichoerus grypus</i>)	160	7	153	VLA Truro
Pilot whale (<i>Globicephalus melas</i>)	1	1	0	VLA Truro

TABLE 8 SALMONELLA ISOLATES FROM WILDLIFE 2001, 2002

2001

SPECIES AFFECTED	SALMONELLA ISOLATE	LOCALITY	COMMENT	PROJECT
Marine mammals				
Harbour Porpoise (<i>Phocoena phocoena</i>) x 4 (immature animals)	<i>Salmonella</i> 4,12:-	S. England	Isolation from intestine or lungs of 4 animals	Stranded Cetaceans Project
Harbour Porpoise	<i>Salmonella</i> 4,12:-	S. England		“ “ “
Harbour Porpoise	<i>Salmonella</i> 4,12:A:-	S. England		“ “ “
Harbour Porpoise	<i>Salmonella</i> 4,12:A:-	S. England		“ “ “
Grey Seal (<i>Halichoerus grypus</i>)	<i>S enteritidis</i> DT8	S. England. Seal pups from animal rescue sanctuary	Clinical significance not known	
Grey Seal	<i>S enteritidis</i> DT8		Clinical significance not known	
Common Seal (<i>Phoca vitulina</i>)	<i>S typhimurium</i> DT 104	E. England		
Terrestrial mammals				
Red Squirrel (<i>Sciurus vulgaris</i>)	<i>Salmonella</i> 4,5,12:-	E. England	Not clinically significant	
House mouse (<i>Mus musculus</i>)	24 isolates - <i>S enteritidis</i> x 15 <i>S typhimurium</i> x 7 <i>Salmonella</i> O rough:gm <i>Salmonella</i> 4,12:1	Various pig and poultry farms in S. England	<i>Salmonella</i> isolated from 24 of 64 samples cultured.	<i>Salmonella</i> wildlife vectors on pig and poultry farms. Project results in UK OIE 2001 Report
Brown rat (<i>Rattus norvegicus</i>)	<i>S enteritidis</i> x 1 <i>S derby</i> x 1	Oxon	<i>Salmonella</i> wildlife vectors on pig and poultry farms.	<i>Salmonella</i> wildlife vectors on pig and poultry farms.
Badger (<i>Meles meles</i>)	<i>Salmonella</i> 4,12:-:1,2	E. Anglia	<i>Salmonella</i> wildlife vectors on pig and poultry farms.	<i>Salmonella</i> wildlife vectors on pig and poultry farms.
Hedgehog (<i>Erinaceus europaeus</i>)	<i>S enteritidis</i> DT 11	E. Anglia		
Hedgehog	<i>S enteritidis</i> DT 11	E. Anglia		

TABLE 8 (cont'd) SALMONELLA ISOLATES FROM WILDLIFE, 2001

SPECIES AFFECTED	SALMONELLA ISOLATE	LOCALITY	COMMENT	PROJECT
<u>Birds</u>				
Non-passerine birds				
Tawny owl (<i>Strix aluco</i>)	<i>S. typhimurium</i> DT 56	Scotland	Avian tuberculosis death	
Herring gulls x 3 (<i>Larus argentatus</i>) Mass mortality of gulls and shore birds	<i>S. typhimurium</i> DT 41	N. England	Avian botulism suspected.	
Passerine birds				
Wild birds (not identified)	<i>Salmonella</i> 13, 23:1:-	S. England		Salmonella vectors on pig and poultry farms
Wild birds (not identified)	<i>S. typhimurium</i> RDNC	S. England	Garden bird mortality	
Wild bird (not identified)	<i>Salmonella give</i>	E. England	"	
Wild bird (not identified)	<i>S. typhimurium</i> RDNC	Wales	"	
Finch (not identified)	<i>S. typhimurium</i> DT 41	N. England	"	
Finch (not identified)	<i>S. typhimurium</i> DT 121	E. England	"	
Finch (not identified)	<i>S. typhimurium</i> DT 121	E. England	"	
Finch (not identified)	<i>S. typhimurium</i> DT 121	E. England	"	
Greenfinch	<i>S. typhimurium</i>	N. England	"	
Greenfinches x 2. 15 deaths in 3 weeks	<i>S. typhimurium</i> DT 56	N. England	"	WNV
Greenfinches x 2	<i>S. typhimurium</i> DT 40	S. England	"	WNV
Greenfinch	<i>S. typhimurium</i> DT 40	N. England	"	WNV
Rooks x 12 (<i>Corvus frugilegus</i>)	<i>S. agona</i>	E. England	Culled crows	WNV
<u>Insects</u>				
Flies (not identified)	<i>S enteritidis</i> x 6 <i>S typhimurium</i> x 3	S. England	Salmonella wildlife vectors on pig and poultry farms. 9/14 samples positive.	Salmonella wildlife vectors on pig and poultry farms.

TABLE 9 SALMONELLA ISOLATES FROM WILDLIFE

2002

SPECIES AFFECTED	SALMONELLA ISOLATE	LOCALITY	COMMENT	PROJECT
<u>MAMMALS</u>				
Marine mammals				
Harbour Porpoise (<i>Phocoena phocoena</i>) x 7	<i>Salmonella</i> 4,12:-:-	S. England	Isolation from 7 different animals	Sea mammals
Harbour Porpoise x 3	<i>Salmonella</i> 4,12:A:-3	S. England	Isolation from 3 different animals	Sea mammals
Terrestrial mammals				
Badger (<i>Meles meles</i>)	<i>Salmonella kottbus</i>	S. England		
Hedgehog (<i>Erinaceus europaeus</i>)	<i>S. enteriditis</i> DT 11	E. Anglia		
Hedgehog	<i>S. enteriditis</i> DT 11	E. Anglia		
<u>BIRDS</u>				
Passerines				
Greenfinch (<i>Carduelis carduelis</i>)	<i>S. typhimurium</i> DT 1	S. England	Suspected garden bird mortality	WNV
Greenfinch	<i>S. typhimurium</i> DT 40	S. England	"	
Greenfinch	<i>S. typhimurium</i> DT 56	S. England	"	WNV
Greenfinch	<i>S. typhimurium</i> DT 56	S. England	"	
Greenfinch	<i>S. typhimurium</i> DT 40	S. England	"	
Reed Bunting (<i>Emberiza schoenicus</i>)	<i>S. typhimurium</i> DT 56	Midlands		WNV
Wild bird (unidentified)	<i>S. typhimurium</i> untyped	Midlands	Suspected garden bird mortality	WNV
Wild bird (unidentified)	<i>S. typhimurium</i> untyped	Midlands	"	WNV
Wild bird (unidentified)	<i>S. typhimurium</i> DT 56	Midlands	"	WNV
Wild bird (unidentified)	<i>S. typhimurium</i> untyped	S. England	"	
Wild bird (unidentified)	<i>S. typhimurium</i> DT 40	S. England	"	

TABLE 10 ISOLATES OF SALMONELLA FROM WILD BIRD CARCASSES IN SCOTLAND

MAY 2000 TO AUGUST 2002

Examinations and data supplied by SAC, Veterinary Science Division, Avian Health Unit, Ayr, from carcasses submitted to the AHU.

Most of these examinations were from a study funded by the Dulverston Trust and the Game Conservancy Trust. The SAC VSD receives financial support from the Scottish Executive Environment and Rural Affairs Department.

Species or group of bird	<i>Number of carcasses examined</i>	Number positive for <i>Salmonella</i>	Phage type of <i>Salmonella typhimurium</i>
Chaffinch	28	10	40 x 4, 56 variant x 6
House Sparrow	35	20	40 x 8, 41 x 2, 56 variant x 10
Tree Sparrow	3	3	56 variant x 3
Greenfinch	52	35	40 x 28, 56 variant x 7
Siskin	12	1	40 x 1
Woodpigeon	19	0	
Goldfinch	4	3	40 x 3
Blackbird	12	0	
Feral pigeon	27	1	99 x 1
Collared dove	9	0	
Starling	30	0	
Corvids	29	1	40 x 1
Raptors	6	2	104 x 1, 56 variant x 1
Swans and ducks	1	0	
Miscellaneous gulls	42	3	41 x 2, 195 x 1
Tits	1	0	
Other species	15	0	
Total	325	79	

Table 11 Salmonella wildlife vectors on pig and poultry farms, 2002
Data from VLA Weybridge

Species	County / England	No. faecal samples positive for salmonella/ No. samples taken	Serotype
House mouse <i>(Mus musculus)</i>	Oxfordshire	2/4	S. enteritidis (2)
	Surrey	0/2	-
	Gloucestershire	2/7	S. kedougou (2)
	Leicestershire	3/6	S. livingstone (2) S. infantis (1)
	West Sussex	4/4	S. enteritidis (3) S.typhimurium (1)
	Northamptonshire	1/1	S. enteritidis (1)
	Bedfordshire	0/1	-
	Suffolk	3/7	S.typhimurium (3)
	Norfolk	1/5	S. derby (1)
	Somerset	0/7	-
	Dorset	0/6	-
	Carmarthen	2/7	S. enteritidis (2)
	Beetles (not identified)	Carmarthen	0/1
Wild Birds (not identified)	Suffolk	3/6	S. typhimurium (2) S. london (1)
	Norfolk	0/7	-
	Gloucestershire	2/9	S. agona (2)
	Somerset	0/3	-
	Dorset	1/10	S. ajiobo (1)
	Wiltshire	4/17	S. typhimurium (2) 4,5,12,-:- (1) S. derby (1)
	Carmarthen	2/3	S. enteritidis (2)
	Flies (not identified)	Oxfordshire	1/1
Devon	0/6	-	
West Sussex	½	S.enteritidis (1)	
Carmarthen	9/14	S. enteritidis (9)	
Brown rat <i>(Rattus norvegicus)</i>	Oxfordshire	3/10	S.enteritidis (2) S. indiana (1)
	Gloucestershire	0/1	-
	Devon	0/1	-
	Suffolk	3/7	S. typhimurium (2) S. london (1)
	Dorset	0/2	-
	Wiltshire	0/6	-
Fox	Dorset	0/1	-
	Somerset	0/2	-
Totals		47/166	

Table 12a **Dead birds found in gardens or near bird feeders, between January 2001 - September 2002 (21 month period) : Phoned reports from the public to the RSPB**

Data supplied by the RSPB

Bird mortality incidents were reported from 39 English counties, Wales, South Scotland, East Scotland and Highland.

January 2001 - September 2002:	
Total number of reported incidents	266
Incidents involving greenfinches, house sparrows, chaffinches and goldfinches	211
Incidents involving only collared doves and wood pigeons (many of which will be trichomoniasis incidents)	17
Incidents involving other species, mainly garden passerines	38
TOTAL	266 incidents

Notes

1. Further data for the four most frequently affected species in these incidents are given in Table 12b below; many of these incidents are attributable to *Salmonella typhimurium* infection ('garden bird mortality').

2. Many garden bird mortality incidents will involve deaths of more than one species.

Table 12b **See note above**

Species	No of reported incidents / species	Reported mortality / species	Average incident mortality / species
Greenfinches	205	1001	4.8
House sparrows	82	284	3.5
Chaffinches	41	77	1.8
Goldfinches	13	24	1.8

Table 13

Avian wildlife diseases in Scotland- 2002

**SAC Veterinary Science Division, Avian Health Unit
Data supplied by SAC**

Disease/infection	Species affected	Details
Avian botulism (suspected)	Miscellaneous species of gull	July, August
<i>E coli</i> O86 infection	Greenfinches, siskin, chaffinch	March, April, August, September
Lead poisoning	Mute swans	January and February. Kidney lead 908 and 174ppm DM
Presumed starvation	Barn owls, tawny owl, heron, guillemot	February, September, October
Trauma	Chaffinches, siskin, goldfinch, house sparrows, magpies, mute swans, woodpigeon, song thrushes, blackbirds, greenfinches, sparrowhawk, collared dove, robin	January, March, April, May, June, July, August, September, October, November
“Corvid respiratory disease” Airsacculitis, pneumonia, often associated with large numbers of <i>Syngamus trachea</i> , often with poor bone quality.	Rooks, carrion crows, jackdaws	May, June, August
Squamous papilloma	Chaffinches	January, March, May
<i>Pasteurella multocida</i> (probably cat victim)	Greenfinch, carrion crow, blackbird, tawny owl	April, May, July, October
Helminthiasis – <i>Echinuria uncinata</i> , +/- amyloidosis	Mute swan	Four immature birds in same group in January and February. Also an immature bird from a different location in April.
Helminthiasis - hairworms	Feral pigeons	November
Hexamitiasis	Feral pigeon	November
Meningitis	Rook	Fibrino-purulent meningitis on histopathology. Bird unable to fly. <i>S Typhimurium</i> DT40 through selenite. February.
Trichomoniasis (presumptive)	Collared dove	May

Table 13 Avian wildlife diseases in Scotland- 2002 – cont'd

**SAC Veterinary Science Division, Avian Health Unit
Data supplied by SAC**

Disease/infection	Species affected	Details
Pox	Woodpigeon	September
Aspergillosis	Blackbirds, greater black-backed gull	All four blackbird nestlings found in an abandoned nest in May. Gull in July. Immature blackbird in October.
Mycotic pneumonia	Feral pigeon, starling	Gross lesions and histopathology but no fungi cultured. January, October
CNS of unknown aetiology. <i>N</i> see Reference 27	Starlings, house sparrow	May, June

Table 14 Data from the Wildlife Veterinary Investigation Centre, Truro, Cornwall

Species Affected	Disease / Infection	Numbers affected	Method of Diagnosis	County location
Fox	<i>Angiostrongylus vasorum</i> + <i>Capillaria sp</i> - pneumonia	1	PM	Cornwall
Fox	<i>Angiostrongylus vasorum</i> + <i>Sarcoptes scabiei</i>	3	PM & microscopy	Cornwall
Roe deer	<i>Dictyocaulus viviparus</i> pneumonia	1	PM & microscopy	Cornwall
Otter	<i>Listeria sp.</i> + <i>Yersinia pseudotuberculosis</i> – generalised	1	PM, bacteriology & histopathology	Cornwall
Otter	<i>Corynebacterium ulcerans</i> , mixed infection - bite wound	1	PM & bacteriology	Cornwall
Hedgehog	<i>Crenosoma sp.</i> – pneumonia	1	PM & microscopy	Cornwall
Greenfinch	<i>Salmonella typhimurium</i> PT1	3-6/wk for 2 mths	PM & culture	Cornwall
Greenfinch	<i>S typhimurium</i> PT40	1	PM & culture	Cornwall
Greenfinch	<i>S typhimurium</i> PT40	several	PM & culture	Devon
Greenfinch	<i>S typhimurium</i> PT40	several	PM & bacteriology	Cornwall
Greenfinch	Group B salmonella - pending	2	PM & bacteriology	Cornwall
House sparrow		5		
Tree sparrow	<i>S typhimurium</i> PT pending	1	PM & bacteriology	Wiltshire

DATA FROM WILDLIFE HOSPITALS

Table 15 Data from the RSPCA West Hatch Wildlife Hospital, Somerset

Species Affected	Disease / Infection	Numbers affected	Method of Diagnosis	County location
Badger	<i>Mycobacterium bovis</i> / wounds OIE List B disease	2	Culture	Devon
Rabbit	Myxomatosis OIE List B disease	>30	Clinical history	Somerset
Rabbit	Coccidiosis	>20	Clinical history	Somerset
Fox	Sarcoptic mange	>10	Skin scrape Clinical history	S W England
Hedgehog N	Yersiniasis	1	Histopathology	Somerset
Herring gull	Botulism	>10	Clinical history	S W England
Roe deer N	Acidosis / barley poisoning	1	Clinical history and necropsy	Somerset
Mute swans	Oil / diesel pollution incidents	>20	Clinical history	S W England
Mute swans	Lead poisoning	>50	Biochemistry	S W England
Mute swans	Aspergillosis	>5	Necropsy	S W England
Buzzard N	Lead poisoning	1	Biochemistry	Somerset
Buzzard	Helminthiasis	>20	Clinical history / parasitology	S W England
Buzzard	Trichomoniasis	≅ 10	Clinical history / microscopy	S W England
Tawny owl	Trichomoniasis	5	Clinical history	S W England
Gannet	Campylobacter	1	Culture	Devon
Gannet	Aspergillosis	3	Necropsy	Devon

Table 16 Surveillance for the Species Recovery Programme, Free-living and Rehabilitated Wildlife, April 2001-March 2002, England

Data supplied by the Zoological Society of London

Species Affected	Disease / Condition	Method of Diagnosis	Comment
Marsh harrier (<i>Circus aeruginosus</i>)	Starvation	Necropsy	Free-living bird
Red Kite	Mycobacteriosis	Necropsy and microbiology	Kites, free-living or rehabilitated.
Red Kite	Traumatic deaths: - entanglement - 1 - lead shot (chronic peripheral neuropathy) - 1 - predation - 1 - train - 2 - unknown cause - 1 Poisoning - 11 Osteodystrophy - 1	Necropsy, microbiology and toxicology	Kites, free-living or rehabilitated. Examined by the Institute of Zoology between 1999-2002
Red Squirrel	Enteritis possibly caused by adenovirus and/or <i>Campylobacter</i> sp. infection	Necropsy and microbiology including EM	Deaths at a captive breeding initiative
Common Dormouse (<i>Muscardinus avellanarius</i>)	Infection of <i>Rodentolepis</i> spp. (? <i>R. straminea</i>) Cestoda. <i>Heligmosomoides polygyrus</i> Nematoda, infections.	Necropsy and microbiology	Examination of animals at captive breeding initiatives. <i>H. polygyrus</i> infection was probably fatal in one case, reference 32.

DATA FROM WILDLIFE HOSPITALS – cont'd

Table 17 Data from the RSPCA Wildlife Hospital, Kings Lynn, Norfolk

Species Affected	Disease / Infection	Numbers affected	Method of Diagnosis	County location
Red fox <i>N</i>	<i>Leptospira copenhageni</i> OIE List B disease	1	Clinical signs and serology	E. England
Red fox	<i>L. icterohaemorrhagiae</i> OIE List B disease	1	Clinical signs and serology	E. England
Tawny owl	Avian Tuberculosis OIE List B disease	1	Pathology Histology ZN staining	E. England
Black-headed gull	Avian Tuberculosis OIE List B disease	1	Pathology Histology ZN staining	E. England
Blackbird	<i>Pasteurella multocida</i> septicaemia secondary to cat bite wounds	1	Culture	E. England
Collared doves	Trichomoniasis	25	Clinical findings and microscopy	E. England
Rabbits	Myxomatosis	25	Clinical history	E. England
Starling	Avian pox	1	Histopathology	E. England
Collared dove	Avian pox	1	Histopathology	E. England
Dunlin	Botulism (suspected)	5-6	Clinical history	E. England
Black-headed gull	Botulism (suspected)	10	Clinical history	E. England
Herring gulls	Botulism (suspected)	5-6	Clinical history	E. England
Mallards	Botulism (suspected)	10	Clinical history	E. England
Herring gull	Aspergillosis	1	Pathology	E. England
Lesser black backed gull	Botulism (suspected)	1	Clinical history	E. England
Tawny owl	Trichomoniasis	4	Clinical findings and microscopy	E. England
Mallard <i>N</i>	<i>Mycoplasma anatis</i> sinusitis / conjunctivitis	2	Culture	E. England
Hedgehog	<i>Trichophyton erinacei</i>	17	Clinical findings and culture	E. England
Hedgehog	Haemolytic <i>E coli</i> septicaemia	1	Culture and histopathology	E. England
Hedgehog	<i>Salmonella enteritidis</i> septicaemia	20	Culture	E. England
Hedgehog	Parasitic pneumonia <i>Crenosoma</i> &/or <i>Capillaria sp</i>	c300	Clinical history and faecal smears	E. England
Common seal	Parasitic bronchopneumonia	20	Clinical findings and faecal smears	E. England
Common seal <i>N</i>	Phocine distemper virus	Total not yet known	Pathology, serology, immunoperoxidase, PCR	E. England

DATA FROM WILDLIFE HOSPITALS – cont'd

Table 18 Data from St Tiggywinkles Wildlife Hospital, Buckinghamshire, 2001

Species Affected	Disease / infection	Numbers affected	Method of diagnosis	County location
Mallard duck	Avian botulism	70	Clinical diagnosis (not confirmed)	Bucks
Domestic duck (white etc living in wild)	Avian botulism	15	ditto	Bucks
Mute Swan	Avian botulism	4	ditto	Bucks
Coot	Avian botulism	1	ditto	Bucks
Fox	Mange	12	Microscopy	London area
Hedgehog	Mange	47	Microscopy	Bucks, Oxon
Rabbit	Myxomatosis OIE List B disease	72	Clinical diagnosis	Bucks, Berks, Oxon
Collared dove	Trichomoniasis	35	Clinical diagnosis	ditto
Wood pigeon	Trichomoniasis	27	Clinical diagnosis	ditto
Feral pigeon	Trichomoniasis	12	Clinical diagnosis	ditto
Tawny owl	Trichomoniasis	5	Clinical diagnosis	ditto
Stock dove	Trichomoniasis	2	Clinical diagnosis	ditto

Table 19 Louping-ill wildlife sero-surveillance undertaken by the Moredun Research Institute.

See Reference 6

Disease / infection	Species affected	Numbers affected	Method of diagnosis	Locality
Louping ill	Red grouse (<i>Lagopus lagopus scoticus</i>)	714 sera tested 28 sero-positive No disease seen	Haemagglutination inhibition serology	Various locations, in Scotland and England
Louping ill	Mountain hare (<i>Lepus timidus</i>)	330 sera tested 35 sero-positive No disease seen	Haemagglutination inhibition serology	Various locations in Scotland
Louping ill	Roe deer (<i>Capreolus capreolus</i>)	43 sera tested 19 sero-positive No disease seen	Haemagglutination inhibition serology	Aberdeenshire, Scotland

Table 20 Serological results for murine pathogens in wild grey squirrels trapped in North Wales

Reference 26, ELISA serology

Virus	Number tested	Number positive (%)
Ectromelia (mouse pox virus)	19	1 (5.3)
Murine cytomegalovirus (MCMV)	4	4 (100)
Mouse adenovirus (MAV) strains FL and K87	15	9 (60)
Minute virus of mice (MVM)	15	3 (20) (+/-)
Reovirus 3	15	12 (80)
Rotavirus	8	5 (62.5)
Murine coronavirus	19	7 (36.8)
Sendai virus	19	10 (52.6)
Murine pneumonia virus (PVM)	15	3 (20)
Lymphocytic choriomeningitis virus (LCMV)	19	4 (21)
Theiler's mouse encephalomyelitis virus (TMEV), GDVII strain	15	2 (13.3)
<i>Mycoplasma pulmonis</i>	15	4 (26.7)
Hantavirus	11	0
Tyzzler's disease (<i>Clostridium piliforme</i>)	11	0
<i>Leptospira</i> combined antigens	11	0

Abbreviations :

Defra	Department of Environment, Food and Rural Affairs
OIE	Office International des Epizooties
VLA	Veterinary Laboratories Agency
SAC	Scottish Agricultural Colleges
RSPB	Royal Society for the Protection of Birds
BTO	British Trust for Ornithology
RSPCA	Royal Society for the Prevention of Cruelty to Animals
CSL	Central Science Laboratory (Defra)
N	Selected diseases that are new to the UK OIE Report, indicating a new pathogen, new host species or a previously unreported disease
FAT	Fluorescent antibody test
ELISA	Enzyme linked immuno-assay
PCR	Polymerase chain reaction (test)

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