Salmonella infections in garden birds and cats in a domestic environment

Citation for published version:
Taylor, DJ & Philbey, AW 2010, 'Salmonella infections in garden birds and cats in a domestic environment' Veterinary Record, vol. 167, no. 1, pp. 26-7. DOI: 10.1136/vr.c3156

Digital Object Identifier (DOI):
10.1136/vr.c3156

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Early version, also known as pre-print

Published In:
Veterinary Record

General rights
Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.
**Short Communications**

### Salmonella infections in garden birds and cats in a domestic environment

**D. J. Taylor, A. W. Philbey**

WILD bird strains of *Salmonella enterica* serovar Typhimurium, including phage types (definitive types) DT40 and DT56v, have been associated with disease in finches (Family Fringillidae), cats and human beings in the UK and Sweden (Tauni and Österlund 2000, Pennycoott and others 2006, Hughes and others 2008, Philbey and others 2008, 2009). Salmonellosis in wild finches in the UK is related to congregation of birds around feeding tables in gardens in the cooler months of the year (Pennycoott and others 2006). Cats are thought to become infected with wild bird strains of *S* *Typhimurium* by catching small birds at these feeding stations (Philbey and others 2008), but a direct link between salmonellosis in birds and cats has not been demonstrated. This short communication describes a study to investigate the occurrence of *Salmonella* species in wild birds, cats and the environment in a domestic setting.

The study site comprised a household and two adjoining village gardens in Lennoxtown, near Glasgow, with three human occupants and two male neutered domestic shorthair cats (cat 1: five years old; cat 2: 10 years old). Feeders containing mixed seed, niger seed, peanuts or fat were provided at two feeding sites in each of the gardens. Sick birds were observed in both gardens over an eight-week-period from late December 2008 to early February 2009 (Fig 1a). During this period, cat 1 caught 14 goldfinches (*Carduelis carduelis*) and eight siskins (*Carduelis spinus*), and later caught several greenfinches (*Carduelis chloris*) and chaffinches (*Fringilla coelebs*) (Fig 1b). Many of these birds were taken from cat 1 by cat 2 and, apart from intact birds retrieved for postmortem examination, the birds were mostly eaten indoors by either of the two cats. In the previous year, cat 1 had caught only a few small rodents.

Six uneaten or partially eaten carcases (two siskins, two chaffinches, one goldfinch and one greenfinch) were retrieved from the cats in January and February 2009 (Table 1, Fig 1c). On gross examination, all six carcases had pale yellow foci, 1 to 2 mm in diameter, in the liver and spleen (Fig 1d). Histological examination revealed that these foci were necrotising inflammatory lesions containing colonies of bacteria (Fig 1e). Samples of tissue from these birds, along with tissue from one wood mouse (*Apodemus sylvaticus*) caught by one cat, were submitted for *Salmonella* species isolation. Faecal samples were collected from each cat on two occasions, along with 22 swabs from various sites in the gardens and the household, from January to March 2009, and also cultured for *Salmonella* species.

**FIG 1**: (a) Sick siskin (*Carduelis spinus*) on a niger seed feeder at feeding site 1. (b) Cat 1 with a goldfinch (*Carduelis carduelis*) inside the house. (c) Goldfinch 1 that had been caught by cat 1; *Salmonella enterica* serovar Typhimurium DT40 was isolated from this bird. (d) Multiple pale yellow foci in the liver (L) and spleen (S) of goldfinch 1. (e) Histological section of the liver of goldfinch 1, showing focal necrotising hepatitis. Haematoxylin and eosin. Bar=100 µm

Tissues, faecal samples and swabs from the environment were inoculated into tetrahydrobate broth and incubated overnight at 37°C aerobically, then subcultured on to Salmonella Shigella agar and desoxycholate agar (Oxoid). Bacterial colonies typical of *Salmonella* species were subcultured and identified by slide agglutination and biochemical testing (API 20E, bioMérieux) as *Salmonella* species. The serovar and phage type of the isolates were determined at the Scottish Salmonella Reference Laboratory.

*S* *Typhimurium* phage type DT40 was recovered from the liver, spleen, intestine or partially eaten viscera of the six bird carcases submitted for postmortem examination, from one faecal sample from each cat, from the sample of mouse viscera and from the ground under the four bird-feeding stations in the main garden, as well as the ground under two feeding stations in the neighbouring garden (Table 1). However, samples from the bird feeders, the contents of a vacuum cleaner in the house, the sewerage drain of the house, and...
other debris from birds brought into the house by the cats were all negative. A chaffinch with foot lesions and a chaffinch killed by a sparrowhawk (Accipiter nisus) were also both negative for Salmonella species. Faecal swabs from both cats and from the ground under the feeding stations were negative for Salmonella species when resampled on February 3, 2009. The two cats and all three human occupants of the house remained clinically healthy. This study demonstrates that S Typhimurium DT40 can be isolated from cats that have preyed upon infected wild birds in a suburban garden. Finches with clinical disease during outbreaks of salmonellosis are more likely to be caught and eaten by cats around feeding stations. Contamination of garden environments with wild bird strains of S Typhimurium through the hunting activities of their cats or by contact with the environment around bird-feeding stations in gardens.

These findings confirm that cats can be infected with S Typhimurium DT40 by catching and eating garden birds, and that both cats and the garden environment are a potential source of infection for human beings.

Acknowledgements
The authors thank Richard Irvine for gross photography, Lynn Stevenson for processing histological sections and Kathleen Reynolds and Manuel Fuentes for culturing and identifying the Salmonella species isolates. The authors also thank John Coia and Henry Mather at the Scottish Salmonella Reference Laboratory for determining the serovars and phage types.

References
Salmonella infections in garden birds and cats in a domestic environment

D. J. Taylor and A. W. Philbey

Veterinary Record 2010 167: 26-27
doi: 10.1136/vr.c3156

Updated information and services can be found at:
http://veterinaryrecord.bmj.com/content/167/1/26.full.html

These include:

References
This article cites 7 articles, 4 of which can be accessed free at:
http://veterinaryrecord.bmj.com/content/167/1/26.full.html#ref-list-1

Article cited in:
http://veterinaryrecord.bmj.com/content/167/1/26.full.html#related-urls

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/