Free Flying Sparrows as Carriers of Salmonellosis

I. R. TIZARD, N. A. FISH AND J. HARMESON*

SUMMARY

Salmonella typhimurium was isolated from nine of 60 wild sparrows trapped in the Guelph area. While this organism was isolated from birds trapped at several different locations, the highest prevalence was in sparrows trapped in close proximity to an animal clinic. The significance of these findings in relation to human and animal salmonellosis is discussed.

RÉSUMÉ

Les moineaux, porteurs de salmonelles

Cette étude a permis d'isoler *Salmonella typhimurium* chez neuf des 60 moineaux capturés dans la région de Guelph. Même si on réussit à isoler cette bactérie chez des moineaux capturés à plusieurs endroits, elle était présente chez un plus grand nombre de ceux qui provenaient du voisinage d'une clinique vétérinaire. Les auteurs commentent la signification de leurs résultats en rapport avec la salmonellose humaine et animale.

INTRODUCTION

Salmonellosis occurs in either domestic or wild birds (2, 3) and outbreaks of infection can lead to both significant morbidity and mortality in infected flocks. The sources of these infections are not always clear. During the course of a survey of free flying wild birds in the Guelph region for toxoplasmosis it was found that a relatively high proportion carried *Salmonella* organisms in their tissues. The results of this survey and their implications are discussed in this report.

MATERIALS AND METHODS

Birds — Free flying birds were caught by mist-netting during the months of December through May. A total of 60 healthy house sparrows (*Passer domesticus*) and 22 common starlings (*Sternus vulgaris*) were trapped in this way. The mist-nets were situated at three locations. Location A, a garden in suburban Guelph, where 24 sparrows and five starlings were trapped. Location B, outside the Large Animal Clinic of the Ontario Veterinary College, yielded seven sparrows. Location C at the Ontario Ministry of Agriculture and Food Swine Research Station at Arkell, located approximately 10 km southeast of Guelph where 29 sparrows and 17 starlings were captured. As soon as possible after trapping the birds were taken to the laboratory and euthanized by chloroform. Their brain, liver and spleen were immediately removed aseptically, placed in a glass homogenizer and emulsified in 5 ml of sterile saline. Some 0.5 ml of this suspension was administered intraperitoneally to each of four mice and aliquots were also taken for bacteriological studies. Some mice died as a result of these inoculations and bacterial cultures were made on homogenates prepared from their brain, liver and spleen.

Bacteriology — Homogenates were cultured on blood, McConkey and brilliant green sulfa plates and differentiated by biochemical tests. The Salmonellae recovered were submitted to the Enteric Reference Centre of the Ontario Department of Health for serotyping and phage typing.

Environmental swabs in the form of tampons were inserted in the sewers of the OVC infirmary at monthly intervals as a monitoring process to determine the prevalence of Salmonellae. Fecal swabs were obtained from cattle, horses, swine and calves housed in the infirmary during the time interval that sewer swabs were utilized. *Salmonella* isolates recovered from the environmental swabs and domestic animals were identified as to serotype and phage typed.

RESULTS AND DISCUSSION

Organisms identified as *Salmonella typhimurium* were isolated from nine of the 60 sparrows (15%) but from none of the starlings. The characteristic organisms from each isolate were similar. There were no appreciable differences in their biochemical reactions. Three phage types were identified namely types 20, 40 and 160. One of the isolates consisted of a rough culture and was thus untypable.

Salmonella were thus found in 2/24 (8.3%) of sparrows trapped in suburban Guelph, 3/7 (43%) of those caught at the OVC Large Animal Clinic, and 4/29 (14%) of those captured at the Arkell Research Station.

Salmonellosis is considered to be a significant problem at the OVC Large Animal Clinic. Because sparrows were readily observed feeding on grain in manure, the relationship between the organisms

*Department of Veterinary Microbiology and Immunology, Ontario Veterinary College, University of Guelph, Guelph, Ontario N1G 2W1. Present address of Dr. Harmeson: Thornhill Veterinary Clinic, 8403 Yonge Street, Thornhill, Ontario.

grown from these sparrows, those isolated from animals and those present in the sewers in the OVC clinics was investigated. *Salmonella typhimurium* phage type 20 was isolated from the sparrows trapped at the clinic but was not detected in sewer swabs, nor in samples from horses, calves or pigs taken at the same time. Nevertheless the very high prevalence of infection in these birds as compared with those caught in other locations is probably important and it is likely that these sparrows could have acquired infection from the manure piles on which they were feeding.

The isolation of Salmonellae from the sparrows at Arkell is also a matter for concern. This farm consists of an SPF pig unit and rigorous steps are taken to ensure that human visitors do not introduce disease. Nevertheless, the sparrows trapped at this location had gathered to feed from the open feed bins in outside pens. The potential for infection of the pigs is obvious.

The sparrows trapped in a Guelph garden were attracted by a feeding station. In doing so they had to avoid the attentions of the local cats and occasional deaths resulted. While the cats did not inevitably consume dead sparrows, preferring to play with them, the potential for infection of these animals is also obvious.

These results were obtained inadvertently during an experiment to investigate the prevalence of toxoplasmosis in these birds. As a consequence of this only selected tissues were available for bacteriological studies and these were not those which would normally be selected for *Salmonella* isolation studies. Consequently we believe that the true prevalence of salmonellosis in sparrows is probably very much greater than that reported here.

Salmonellosis continues to be a significant bacterial infection in man and animals in Canada. During the first quarter of 1978 there were 1,668 *Salmonella* isolations from human sources in Canada and *S. typhimurium* accounting for 45.3% of these is the most commonly isolated serotype (1). The prevalence of Salmonellae in free flying birds is not known although disease outbreaks have been reported in different species (2, 3). Wobeser (4) in 1967 reported *S. typhimurium* isolations from moribund or dead sparrows in the Guelph, Hamilton and Toronto area. These samples were collected around feeding stations during the winter months. Although the birds which we trapped appeared to be healthy, it is probable that the infection is not always innocuous and that it may cause mortalities. These birds unfortunately would be most likely to die in outdoor pig pens or be caught by domestic cats. It is apparent that sparrows, but not starlings, may represent a significant carrier host for this infection. The species difference is possibly due to the different feeding habits of these birds, the sparrows in particular congregate around farms and consume animal feeds, likely to be contaminated. Starlings in contrast tend to be less associated with farm operations and somewhat more omnivorous in their diet.

It might also be appropriate to attempt to exclude birds from some farm operations. While this is obviously difficult, it may be desirable, particularly in SPF operations and in veterinary clinics, to place netting over pens and ensure that manure piles are covered as much as possible.

REFERENCES

1. CANADA DISEASES WEEKLY REPORT. p. 113. Health and Welfare. July 22, 1978.
2. FADDONT, G.P., G.W. FELLOWS and J. BAIRD. A survey of the incidence of salmonellae in wild birds. Avian Dis. 10: 89-94. 1965.
3. HUDSON, C.B. and D.C. TAYLOR. *Salmonella typhimurium* infection in feral birds. Cornell Vet. 47: 394-395.
4. WOBESER, G. *Salmonella typhimurium* infection in house sparrows. Ontario Bird Banding 3: 114-115. 1967.

ABSTRACT

Some observations on beef cattle reproduction and parturition on a large western Canadian ranch. E.D. Janzen, O.M. Radostits, F.M. Bristol and W.F. Cates (Dept. Vet. Clin. Studies, West. Coll. Vet. Med., Saskatoon, Saskatchewan).

The Department of Veterinary Clinical Studies at WCVM has provided a team of clinicians and senior students to assist with the operation of a bovine maternity unit at a large western Canadian ranch in the interior of British Columbia. During the calving seasons of 1974-1978, anywhere from 316 to 965 primiparous heifers have calved in this facility. Dystocia rates range from 36 to 44% for two year old heifers and 21% for three year olds. Proportion of calves born by Caesarean delivery range from 6-11% for two year olds and 2.1% for three year olds. In two year old heifers, the main causes for dystocia were fetal maternal disproportion and abnormal posture. In three year old heifers abnormal presentation and incomplete soft tissue dilation are the predominant contributing factors. In all years calvings and dystocias have been evenly distributed throughout the day. Initial data indicates the annual cow cull rate to be 10.6%. Most of this is due to nonpregnancy or estimated late pregnancy.

Clinical and Research Forum of the Thirtieth Canadian Veterinary Medical Association Annual Convention, Regina, Saskatchewan 1978.