



Salmonella awareness and related management practices in U.S. urban backyard chicken flocks

A. Beam*, L. Garber, J. Sakugawa, C. Koprak

United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services, Centers for Epidemiology and Animal Health, 2150 Centre Ave., Bldg. B, Fort Collins, CO 80526, USA

ARTICLE INFO

Article history:

Received 1 June 2012
Received in revised form
16 November 2012
Accepted 1 December 2012

Keywords:

Poultry
Chickens
Urban
Biosecurity
National Animal Health Monitoring System
Survey
Salmonella
Zoonotic
Miami
Los Angeles
Denver

ABSTRACT

Raising chickens in urban settings is a growing phenomenon in the United States. The United States Department of Agriculture's (USDA) National Animal Health Monitoring System (NAHMS) conducted a cross-sectional study to better understand health and management of privately owned chicken flocks, and *Salmonella* awareness among chicken owners, in three urban settings—Denver, Colorado; Los Angeles, California; and Miami, Florida. Feed stores in each city were visited by data collectors during summer 2010, and customers who owned chickens were asked to complete a questionnaire. A convenience sample of 449 feed store customers was selected, and 382 (85.1%) customers participated in the study. For analysis, a stratified random sample was assumed, with the strata being individual feed stores.

Median flock sizes were 5, 11 and 19 chickens in Denver, Los Angeles and Miami, respectively. In all three cities, over three-fourths of flocks contained table egg chicken breeds on the day the questionnaire was completed. In Denver, 20.4% of flocks had another species of bird present in addition to chickens, compared with 65.6% of flocks in Los Angeles and 53.6% of flocks in Miami.

At the time of data collection in 2010, less than 50% of respondents in Miami and Los Angeles (40.0 and 30.2%, respectively) were aware of a connection between poultry contact, such as contact with chicks or ducks, and *Salmonella* infection in people, compared to 63.5% of respondents in Denver. Urban chicken flock owners who completed the questionnaire in English were more likely to be aware of the connection between poultry contact and *Salmonella*, compared with respondents who completed the questionnaire in Spanish (OR = 3.5). The likelihood of *Salmonella* awareness was also higher for respondents who had heard of USDA's Biosecurity for Birds educational campaign and for respondents who sold or gave away eggs from their flocks (OR = 2.5 and 2.8, respectively).

Study findings demonstrate the importance of reaching the Spanish speaking population when creating educational outreach programs to reduce *Salmonella* infections in people who have live poultry contact.

Published by Elsevier B.V.

1. Introduction

Raising chickens in urban settings is a growing phenomenon in the United States. In recent years, a number

of U.S. cities; including Columbia, Missouri, Ann Arbor, Michigan, Denver, Colorado, and Auburn, Alabama, have passed regulations allowing chickens to be kept at residences (Bartling, 2010). Consumer concerns about food quality and freshness, animal welfare, or consumer interest in local food production and sustainability may partially be driving the increasing popularity of urban backyard chicken flocks (Pollock et al., 2011; Stearns, 2010).

* Corresponding author. Tel.: +1 970 494 7175; fax: +1 970 494 7228.
E-mail address: Andrea.L.Beam@aphis.usda.gov (A. Beam).

Knowledge about the characteristics and management practices of noncommercial chicken flocks is useful for disease preparedness and response. These noncommercial flocks are sometimes involved in avian disease outbreaks. For instance, an economically costly outbreak of exotic Newcastle disease (END) in 2002–03 involved a number of backyard flocks in the Los Angeles, California, area (Pedersen et al., 2004). The USDA–APHIS previously conducted a study that addressed health, biosecurity, and bird movement practices of rural backyard flocks located within 1 mi of commercial poultry operations (Garber et al., 2007). Additionally, Donahue et al. (2011) and Yendell et al. (2012) studied management practices relevant to avian influenza in backyard poultry flocks in Wisconsin and Minnesota, respectively. However, none of these studies focused on chicken flocks in urban settings.

The increasing popularity of urban chicken flocks may also have public health implications (Pollock et al., 2011), since human salmonellosis outbreaks have been linked to contact with live poultry (CDC, 2000, 2009; Wilkins et al., 2002; Loharikar et al., 2012). *Salmonella enterica* can cause acute gastroenteritis and septicemia in humans. *S. enterica* infections are fairly common in domestic poultry throughout the world and infections in poultry are generally subclinical. Occasionally, infection causes diarrhea, loss of appetite, emaciation, and death in young chicks and poults. More often, *S. enterica* colonizes the intestinal tract of birds that become subclinical shedders of *Salmonella* in feces (Lutful Kabir, 2010). Humans are most likely to become infected with *Salmonella* from live poultry by the fecal–oral route. Although people of all ages can become ill, young children and the elderly are most at risk. Twenty-four percent of reported *Salmonella* cases in 2006 occurred in children under 5 years of age (CDC, 2008). For this reason, the CDC advises that children under 5 years of age should not handle poultry (CDC, 2009).

This study was conducted to gain insight about management and biosecurity practices of privately owned chicken flocks in three urban settings—Denver, Colorado, Los Angeles, California, and Miami, Florida, and to determine flock owners' awareness of the risk of *Salmonella* from contact with live poultry.

2. Methods

2.1. Data collection

This study was conducted by the United States Department of Agriculture's (USDA) National Animal Health Monitoring System (NAHMS). Four large cities were initially selected for inclusion in the urban chicken study: Denver, Colorado, Los Angeles, California, Miami, Florida, and New York City, New York. These cities were selected for geographic and demographic diversity. Locating chicken owners in these cities presented a unique challenge because a list of urban chicken owners was not available. Therefore, data collection was accomplished using a convenience sample of feed store customers.

Feed stores that sold chicken feed within the metropolitan area of the four selected cities were identified using public online directories and/or lists available to state or

federal governments. All identified feed stores were contacted for participation. The only eligibility requirement for feed stores was that they estimated having at least five customers purchasing chicken feed on an average Saturday. This requirement was for efficient use of data collectors. Feed stores that agreed to participate were visited by APHIS and State data collectors, most often on Saturdays, from June to September, 2010. New York City was excluded from the feed store-based study because no feed stores meeting eligibility criteria were identified.

Feed store customers who entered participating feed stores while data collectors were present were asked to complete a confidential questionnaire about bird health, biosecurity, and movement practices. Customers were eligible to complete the questionnaire if they had at least one chicken on the day they were asked to complete the questionnaire, lived within a defined geographic area (or kept their chickens at a location within the defined geographic area), and lived on less than 1 acre of land if they lived in a single-family home. The latter two requirements were intended to limit the study to chicken owners in truly urban areas, as opposed to the outskirts of urban areas. For Los Angeles, the defined geographic area was all of Los Angeles County. The defined geographic areas for Denver and Miami are shown in Figs. 1 and 2.

Respondents were offered a \$10 coupon toward their purchase at the feed store as an incentive to complete the questionnaire. The questionnaire took about 10 min to complete, was available in English and Spanish, and contained 31 questions that were primarily yes/no and multiple choice with an opportunity to write in explanations. Data collectors received formal training on administering the questionnaire and customer eligibility before visiting feed stores.

Assuming a response rate of 70%, a sample size of 285 chicken owners in each city was adequate to estimate prevalences of management practices (or flock characteristics) in each city of 50% (± 6 to 7%) and 10% (± 3 to 4%) with 95% confidence (CDC, 2005).

2.2. Data analysis

Data were entered into a SAS data set. Validation checks were performed to identify numeric extremes and improper categorical responses. For analysis, a stratified random sample was assumed, with the strata being individual feed stores. Statistical analysis was conducted using SAS-callable SUDAAN software, which accounts for the sampling design by use of the Taylor linearization method (LaVange et al., 1996).

A multivariable logistic regression analysis was performed to examine associations between flock characteristics and the respondents' *Salmonella* awareness. The respondent being aware of a connection between poultry contact, such as contact with chicks or ducks, and *Salmonella* infection in people, was used as the outcome variable. Independent variables associated ($p < 0.25$) with the outcome in bivariable analysis (adjusted for city) were offered for inclusion in the multivariable model. A backward elimination procedure was used to create the final multivariable model. City was forced into the final

Download English Version:

<https://daneshyari.com/en/article/5793819>

Download Persian Version:

<https://daneshyari.com/article/5793819>

[Daneshyari.com](https://daneshyari.com)