Prevalence of *Salmonella* Serovars in Whole Dressed Chicken Carcasses

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ABSTRACT

Present study was carried out to investigate prevalence and occurrence of different serovars of *Salmonella* spp. in whole dressed chicken carcasses procured from retail markets located in Mumbai city. A total of 200 whole dressed chicken samples were collected from four major chicken markets viz., Parel, Crawford market, Bandra and Kurla, and processed for isolation of *Salmonella* spp.. The study revealed that overall prevalence of *Salmonella* spp. in whole dressed chicken carcasses was 5.5%. All the *Salmonella* isolates obtained were found to be *Salmonella* Typhimurium.

Keywords: Carcass, chicken, quality assurance, retail shops, *Salmonella* Typhimurium

Introduction

The incidences of foodborne illness by *Salmonella* continue to be an important problem throughout the world (Rabsch *et al.*, 2001). Salmonellosis is endemic in nature and responsible for heavy economic losses in India every year (Rahman, 2002). Salmonellosis is a notifiable condition in many countries including US and UK. Although animal protein production and consumption increased in human diet, especially of chicken meat and their products, *Salmonella* in these products always threaten the poultry industry and public health. Two most commonly isolated serotypes of concern and mostly implicated in disease outbreaks are Typhimurium and Enteritidis (Chiu *et al.*, 2004; Buck *et al.*, 2004). Epidemiological data are needed in order to assess magnitude of the problem and to monitor trends over the time. Therefore, studies on surveillance of chicken meat sold in retail market for detection of *Salmonella* was undertaken.

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Materials and Methods

Procurement of samples

A total of 200 whole dressed chicken samples were collected from retail meat shops situated in Mumbai city, wherein live birds were received from poultry farms located around Mumbai city in the region of Raigad, Nasik, Pune and Thane district. Samples were procured from four major chicken markets namely, Parel, Crawford, Bandra and Kurla market. Two representative shops were selected from each market and 25 whole dressed chicken carcasses were collected from one shop, thus a total of 50 samples from each market. All the samples were collected in sterile polythene bags and brought to laboratory on ice by taking all aseptic precautions. The details of the samples collected are depicted in Table 1.

Isolation of *Salmonella*

All the samples were processed for the isolation of *Salmonella* spp. using standard method described by Bureau of Indian Standards (BIS, 1999). Each sample was pre-enriched by inoculating 25 g of meat in 225 ml of buffered peptone broth (BPW) and incubated at 37°C.
with poor hygienic conditions. Besides, the slaughtering and dressing of poultry birds was carried out by a single person on wooden board which was not cleaned and washed properly during and even after the completion of work. However, retail shops at Parel were having better sanitary conditions during slaughtering and dressing of chicken. Bajaj et al. (2003) and Murugkar et al. (2005) reported 69% and 14.7% prevalence of Salmonella in chicken meat samples and live poultry birds, respectively, as compared to the prevalence of Salmonella spp. observed in the present study. However, negligible prevalence of Salmonella spp. in the poultry carcasses collected from organized sector was reported by Vaidya et al. (2005). The difference in incidence reported by different workers may be attributed to various factors such as hygienic conditions prevailing in the processing industry, condition of raw products, geographic and seasonal variation, cleanliness of the workers, etc.

All the Salmonella isolates belonged to Salmonella Typhimurium serovars. Rahman (2002) and Sharma et al. (2005) also reported that Salmonella Enteritidis and Salmonella Typhimurium were commonly occurring serovars from poultry meat from Indian subcontinent. The results in present study are also in accordance with the findings of Chiu et al. (2004) and Buck et al. (2004) that reported S. Typhimurium and Enteritidis to be the most commonly isolated serotypes and implicated in disease outbreaks. Similarly, studies carried out by Ohl and Miller (2001) also reported that ubiquitous non

Results and Discussions

Out of 200 whole dressed chicken carcass samples analyzed from all the four different retail markets selected under study, 11 (5.5%) samples were found positive for Salmonella spp. Amongst the 50 samples analyzed from Parel market, only one sample (2%) contained Salmonella spp., whereas 3 (6.0%) out of 50 samples each from Crawford and Bandra market showed prevalence of Salmonella spp. However, the highest numbers of samples [4 of 50 (8.0%)] were found positive for Salmonella spp. from Kurla market (Table 1).

The higher prevalence of Salmonella spp. in chicken carcasses reported in samples from Kurla, Crawford and Bandra markets could be due to location of retail shops in highly populated area

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Name of the market</th>
<th>Shop I (25)</th>
<th>Shop II (25)</th>
<th>Total (50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parel</td>
<td>1 (4.0 %)</td>
<td>0 (0.0 %)</td>
<td>1 (2.0 %)</td>
</tr>
<tr>
<td>2</td>
<td>Crawford market</td>
<td>1 (4.0 %)</td>
<td>2 (8.0 %)</td>
<td>3 (6.0 %)</td>
</tr>
<tr>
<td>3</td>
<td>Bandra</td>
<td>1 (4.0 %)</td>
<td>2 (8.0 %)</td>
<td>3 (6.0 %)</td>
</tr>
<tr>
<td>4</td>
<td>Kurla</td>
<td>2 (8.0 %)</td>
<td>2 (8.0 %)</td>
<td>4 (8.0 %)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>2 (8.0 %)</strong></td>
<td><strong>2 (8.0 %)</strong></td>
<td><strong>11 (5.5 %)</strong></td>
</tr>
</tbody>
</table>
typhoidal *Salmonella* serotypes, such as *S. Typhimurium* and *S. Enteritidis* infect a wide range of animal host including poultry, cattle and pigs.

The occurrence of *S. Typhimurium* serotype in chicken meat samples procured from different retail shops indicated unhygienic conditions at retail shops during slaughtering, dressing and sale of chicken meat. There is a necessity for strict enforcement of food regulations to improve the existing conditions of local retail shops selling meat from freshly slaughtered food animals including poultry.

References


