**ABSTRACT**

Chicken (110) samples were collected from the retail meat shops of different district headquarters of western Uttar Pradesh and screened for standard plate count (SPC), coliform count, isolation of various bacterial contaminants and their antibiotic sensitivity pattern. The mean of the log_{10} counts for SPC and coliforms were 7.0382 cfug^{-1} and 4.1587 cfug^{-1}, respectively. Out of 110 meat samples, 87 were found positive for the presence of multiple bacteria, namely, *E. coli* (42), *Pseudomonas* spp. (18), *Proteus* spp. (19), *Klebsiella* spp. (23), *Bacillus* spp. (29), *Staphylococcus* spp. (37) and *Salmonella* spp. (4). All the bacterial isolates were subjected to antibiotic sensitivity test by disc diffusion method against commonly used antibiotics, which indicated multi drug resistance.

**Keywords:** Antibiogram, chicken meat, coliform standard plate count, pathogen.
bacteriological examination. Ten grams of each sample was weighed aseptically into sterile plastic containers and macerated. Macerated samples were diluted 1:10 by adding 90 ml of PBS (pH 7.0) and after thoroughly mixing further ten-fold serial dilutions ($10^{-1}$ to $10^{-9}$) were made for standard plate count (SPC) and coliform count (CC). About 50 ml portions of 1:10 suspension were centrifuged at 10,000 rpm for 30 min in a refrigerated centrifuge ($4^\circ$ C). After decanting the supernatant, pellets were used for the isolation of bacteria.

SPC was determined using tryptose soya agar (Difco) and MacConkey agar (Difco) was used for CC. Spread plate method was used for enumeration of both counts.

A loopful pellet of each sample was streaked onto blood agar and incubated at $37^\circ$ C for 18–24 hours under aerobic condition for the isolation of bacteria. All the isolates were purified (Cruickshank, et al., 1975) and were then subjected to the morphological, cultural and biochemical examinations for species confirmations as per the standard procedures (Kreig and Holt, 1984).

The antibiotic sensitivity test was performed by disc diffusion test method as described by Bauer et al. (1996). The isolates were subjected to antibiotic sensitivity test by disc diffusion method against standard discs (Hi media) of amikacin (30 μg), amoxicillin (30 μg), cefotaxime (30 μg), ceftriaxone (30 μg), chloramphenical (30 μg), ciprofloxain (30 μg), kanamycin (30 μg) and tetracycline (30 μg).

The mean standard plate counts $\log_{10}$ (cfu/g) and mean coliform count of chicken meat samples were $7.0382\pm0.33$ and $4.1587\pm0.04$, respectively. The standard plate count varied from $6.7394\pm0.42$ in the samples of Agra to the maximum $7.4775\pm0.10$ in Kashganj (Table 1). Whereas, the coliform counts ranged from $4.1117\pm0.01$ in Agra to the highest $4.2083\pm0.07$ in the samples of Muzzafarnagar (Table 1). These findings are comparable to the findings of Alvarez-Astorga et al. (2002) and El-Khatib et al. (1988) who reported total mesophilic bacterial count of 5.56-7.28 and 6.0-7.0 (cfug$^{-1}$) in chicken meat products in Spain and Egypt, respectively. However, Cohen et al. (2007) reported total bacterial counts and total coliform counts of 4.46 and 2.08 (cfug$^{-1}$) in the chicken marketed in Morocco.

Out of 110 samples, 87 were positive for multiple bacterial species. However, 13 samples showed the presence of single species i.e. $E. coli$ in 8 samples and $Staphylococcus$ spp. in 5 samples. Only 4

**Table 1: Mean standard plate count and coliform count of chicken meat.**

<table>
<thead>
<tr>
<th>Source</th>
<th>No. of samples</th>
<th>Standard plate count $\log_{10}$ cfu/g (Mean±SE)</th>
<th>Coliform count $\log_{10}$ cfu/g (Mean ± SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agra</td>
<td>10</td>
<td>6.7394±0.42</td>
<td>4.1117±0.01</td>
</tr>
<tr>
<td>Aligarh</td>
<td>10</td>
<td>7.0279±0.45</td>
<td>4.1352±0.01</td>
</tr>
<tr>
<td>Badaun</td>
<td>10</td>
<td>7.1426±0.47</td>
<td>4.1408±0.01</td>
</tr>
<tr>
<td>Bareilly</td>
<td>10</td>
<td>6.9331±0.46</td>
<td>4.1575±0.08</td>
</tr>
<tr>
<td>Bulandshahar</td>
<td>10</td>
<td>7.1463±0.41</td>
<td>4.1246±0.05</td>
</tr>
<tr>
<td>Kashganj (Kanshi Ram Nagar)</td>
<td>10</td>
<td>7.4775±0.10</td>
<td>4.2021±0.03</td>
</tr>
<tr>
<td>Mathura</td>
<td>20</td>
<td>6.7808±0.10</td>
<td>4.1824±0.04</td>
</tr>
<tr>
<td>Meerut</td>
<td>10</td>
<td>6.7837±0.10</td>
<td>4.1317±0.03</td>
</tr>
<tr>
<td>Moradabad</td>
<td>10</td>
<td>7.1347±0.34</td>
<td>4.1923±0.05</td>
</tr>
<tr>
<td>Muzzafarnagar</td>
<td>10</td>
<td>7.2164±0.42</td>
<td>4.2083±0.07</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>7.0382±0.33</td>
<td>4.1587±0.04</td>
</tr>
</tbody>
</table>
samples were found positive for *Salmonella*. The highest number of isolates were *E. coli* (38.8%), followed by *Staphylococcus* spp. (33.63%) with the lowest number of *Salmonella* (3.63%) (Table 2). Cohen et al. (2007) reported 48.4%, 10.4% and 1.6% prevalence of *E. coli*, *Staphylococcus* and *Salmonella*, respectively in the marketed poultry meat samples in Morocco. The antibiotic sensitivity test with 10 commonly used antibiotics revealed variable sensitivity pattern with the highest sensitivity to ciprofloxacin and tetracycline (52.91%) and lowest to kanamycin (29.07%) (Table 2).

The findings of the study revealed that mean values recorded for fresh meat were slightly higher than the Indian standards (FSSR, 2011). Higher values than the prescribed standard as seen in the present study puts the consumer at risk. The presence of *E. coli* in foods is an indicator of fecal pollution (Anon, 2003). However, *Staphylococcus* contamination are normally attributed to food handlers, since nasopharyngeal cavity of human beings is the reservoir of microflora from which these bacteria get localized on the skin, especially on hands (Kaplan, 2005 and Stone et al., 2001).

The high bacterial count in the meat samples and presence of pathogenic bacteria like *Salmonella* are of public health concern. Further multiple resistantance of the food pathogens to many antibiotics, as observed in present study is a matter of great concern. It is obvious that there is rising trend of bacterial resistance to antibiotics due to indiscriminate use of antibiotics either to control disease or as growth promoters in animals. Similarly there are growing scientific evidences that the use of antibiotics in food animals, leads to the development of resistant pathogenic bacteria that can reach humans though the food chain (Aarestrup, 1999; van Looveren et al., 2001, Avrain et al., 2003).

**Acknowledgement**

The authors are thankful to incharges of Departments of Microbiology and Immunology, Epidemiology and Preventive Medicine, Livestock Product Technology and Vice Chancellor of Pt. Deen Dayal Upadhaya Veterinary University and Gau Anusandhan Sansthan (DUVASU), Mathura; for providing the requisite facilities to carry out this investigation.

**References**


