Bacteriological Quality of Ice-cream Marketed in Bikaner and its Public Health Significance

V.K. Choudhary1, S.K. Purohit, P.K. Singh* and R.V. Singh2
Department of Veterinary Public Health
College of Veterinary and Animal Science, Bikaner-334001, Rajasthan

ABSTRACT

Twenty five ice-cream samples were collected from Bikaner city and subjected to standard plate count (SPC), coliform count, Escherichia coli count, staphylococcal count, faecal streptococci count and psychrophilic count. On the basis of SPC, only 10 (40%) samples were of satisfactory quality, whereas none of the samples revealed satisfactory coliform count. E. coli and staphylococcal analysis showed that only 2(8%) samples were free from these organisms. Faecal streptococci count of all the samples was more than $1.8 \times 10^3$ per ml, whereas psychrophilic count in the most of samples was in the range of $10^4$ to $>10^5$ per ml. Moreover, 15 (60%) samples were coagulase positive staphylococci.

Keywords: Bacteriological quality, coliform, ice-cream, SPC.

Ice-cream is one of the most popular milk products in our country, however, its quality control in terms of safety is a big concern. Wachukwu et al. (2000) found that ice-cream ranks next to milk among dairy products as a cause of epidemics. Additionally, the careless handling practices and processing operations pose a big threat to safety of the product (Rossi, 1990). Various microbiological studies conducted on quality of ice-creams have revealed the presence of coliform, faecal coliform, Staphylococcus aureus and Salmonella spp. (Kruy et al., 2001; Joshi et al., 2004). An attempt was made here to assess the microbial quality of ice-cream available in a market of Bikaner, an arid town of India.

Twenty five samples of ice-cream were collected aseptically in sterilized sample bottles from the market of Bikaner city. The samples were subjected to bacteriological quality analysis based on standard plate count (APHA, 1960), staphylococcal count (NCFA, 1968), E coli. count (APHA, 1960), coliform count (BIS, 1976), faecal streptococci count (WHO, 1971) and psychrophilic count (APHA, 1960).

On the basis of ISI (1964) standards, 10 (40%) samples were found to be of satisfactory quality having SPC less than $2.5 \times 10^5$ per ml, while 15 (60%) were of unsatisfactory quality (Table 1). Different workers (Purohit, 1997; Kruy et al., 2001) have also reported similar type of findings.

Ice-cream samples were screened as per ISI (1964) standard and found that none of them were of satisfactory quality as the coliform count observed was more than 90/ml. (Table 1). The coliform count of samples ranged from 730 to $5.9 \times 10^5$ per ml with an average count of $9.5 \times 10^4$ per ml. Vibha Kumari et al. (1996) also reported that all the 12 (100%) samples of ice-cream contained coliform exceeding Indian...
Table 1: Bacteriological counts of Ice-cream (n = 25)

<table>
<thead>
<tr>
<th></th>
<th>Standard plate count</th>
<th>Caliform count</th>
<th>E. coli count</th>
<th>Staphylococcal count</th>
<th>Faecal Streptococci count</th>
<th>Psychrophilic count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range No. of Positive samples (%)</td>
<td>Range No. of Positive samples (%)</td>
<td>Range No. of Positive samples (%)</td>
<td>Range No. of Positive samples (%)</td>
<td>Range No. of Positive samples (%)</td>
<td>Range No. of Positive samples (%)</td>
</tr>
<tr>
<td>Less than 2.5x10^5</td>
<td>&lt;90 — 0 2 (8%)</td>
<td>0 2 (8%)</td>
<td>0-10 — 0 —</td>
<td>0-10 — 0 —</td>
<td>0 —</td>
<td></td>
</tr>
<tr>
<td>More than 2.5x10^5</td>
<td>9x10^2—9x10^3 10 (40%)</td>
<td>10-10^2 3 (12%)</td>
<td>10^2-10^3 2 (8%)</td>
<td>10^3-10^4 4 (16%)</td>
<td>10^4-10^6 4 (16%)</td>
<td>&gt;10^5 2 (8%)</td>
</tr>
<tr>
<td></td>
<td>9x10^3—9x10^5 4 (16%)</td>
<td>10^4-10^5 11 (44%)</td>
<td>10^4-10^6 4 (16%)</td>
<td>&gt;10^5 3 (12%)</td>
<td>&gt;10^5 9 (36%)</td>
<td></td>
</tr>
</tbody>
</table>

Among 25 samples, E. coli was present in 23 (92%) samples and the count was in the range of 10^-2 to 10^5 per ml. (Table 1). Further analysis of the samples showed that 15 (60%) samples had coagulase positive staphylococci. The presence of this organism in ice-cream samples has also been reported by Fabrício et al. (2006). The faecal streptococci count was observed in all the 25 (100%) samples and the count was more than 1.8 x 10^3 per 100 ml (Table 1). Turantas (2002) examined 53 samples of ice-cream and reported that 81% samples were positive for faecal streptococci. The psychrophilic count in most of the samples varied between 10^4 to >10^5 per ml. The findings of present study suggests unhygienic conditions during preparation, processing, storage of product or its distribution.

References


Bacteriological quality of ice-cream

pathologie-Enotique, 94: 411-414.

Nordic Committee on Food Analysis (NCFA), 1968. Publication of Royal Veterinary and Agricultural University, Copenhagen, Denmark, No. 44.


