Index of Chevon Sanitary Quality: The Standard Plate Count

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ABSTRACT

Standard plate count (SPC) is the most popular and most widely used method for the enumeration of viable microorganisms of meat. In the present study, 50 raw chevon (goat meat) samples were collected from local meat outlets of Bikaner city (India) and investigated by standard plate count method for quantification of bacterial load. Out of 50 raw chevon samples examined, 5 (10%), 8 (16%) and 37 (74%) samples yielded ≤5×10⁵ (satisfactory grade), >5×10⁵ to <2×10⁶ (acceptable grade) and >2×10⁶ (rejected grade) organisms per gram of meat respectively. Most of the sample tested were not fit for consumption and is an indication of low bacteriological quality of chevon and this can make it a potential source of food borne infection and may constitute a serious public health concern.

Keywords: Chevon, SPC, microorganisms, sample

To evaluate the effectiveness of microbial quality and safety of meat, it is necessary to know the microbial status of meat and meat products so as to adopt appropriate control measures. Bacterial count of meat is used as popular, widely used and an indicator method for the enumeration of viable an index to assess its bacterial quality (Borse et al., 1998; Chaudhari et al., 2008). Standard plate count (SPC) is the most microorganisms. Its utility as a microbial monitor of processing and as a predictor of ultimate food quality has been studied thoroughly (Banwart, 1981; Jay, 1986; Kator and Rhodes, 1991).

Fifty raw chevon (goat meat) samples were collected in pre-sterilized polythene bags from local meat outlets of Bikaner city. Ten gram of each sample was triturated and homogenized with help of a pre-sterilized pestle and mortar containing 90 ml of sterile Normal Saline Solution (NSS). The elute thus obtained was further tested using standard plate count (SPC) using plate count agar medium on the basis of pour plate method (Banwart, 1989). The inoculated plates were incubated at 37°C for 48 h. The plates showing 30-300 colonies of bacteria were selected for recording the result and the counts were expressed as colony forming units (cfu) per g. of sample after multiplying the observed count by dilution factor of each plate.

The evaluation of the quality of the chevon was based on the standards laid down by Goldenberg and Elliot (1973), ICMSF (1974) and BIS (1995). Goldenberg and Elliot (1973) while suggesting the microbiological standards for foods, proposed that the raw meat samples yielding SPC as ≤5×10⁵, >5×10⁵ to <2×10⁶ and ≥2×10⁶ organisms per g., should be classified as satisfactory, acceptable and rejected grade category, respectively. ICMSF (1974) also suggested that raw meat having SPC of 10⁶ and 10⁷/g should be considered as satisfactory and of rejected grade, respectively. As per Bachhil (1986) and BIS (1995) the permissible level of SPC in meat should be 1×10⁶/g and the level above this the lot has to be rejected. Viewing the grades assigned by both the above scientists, ICMSF (1974), Bachhil (1986) and BIS (1995), it is clear that the acceptable and rejected grade category was almost based on the similar number of microbial population and is the most popular and most widely used standard for evaluation of bacteriological load in meat.

In the present study, out of 50 raw chevon samples examined, 5 (10%), 8 (16%) and 37 (74%) samples yielded ≤5×10⁵, >5×10⁵ to <2×10⁶ and ≥2×10⁶ organisms per gram of meat respectively. Results of the present study reflect poor quality of chevon and unhygienic practices involved in the meat outlets of Bikaner city. Also, it is generally accepted that microbial loads on surfaces and
The microbial quality of chevon sold in meat outlets of Bikaner city is not satisfactory. It is suggested that the raw chevon should be handled under strict hygienic condition with constant microbial monitoring and stored in cool places to avoid recontamination and should be cooked properly before consumption (WHO, 1976). Further, this study emphasizes the need for continued bacteriological study to monitor the sanitary quality of chevon being a highly perishable commodity and for safeguard the health of consumers.

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References


BIS 1995. Indian Standard of Meat and Meat Products in mutton and goat meat (chevon) – fresh, chilled and frozen technical requirements (First Revision), Bureau of Indian Standards (BIS), New Delhi.


Table 1: Standard plate count (SPC) of raw chevon samples.

<table>
<thead>
<tr>
<th>Range of SPC/g of meat</th>
<th>Grade</th>
<th>No. (%) of samples</th>
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<tbody>
<tr>
<td>&lt;5x10^5</td>
<td>Satisfactory</td>
<td>5 (10%)</td>
</tr>
<tr>
<td>&gt;5x10^5 to 2x10^6</td>
<td>Acceptable</td>
<td>8 (16%)</td>
</tr>
<tr>
<td>50 per cent repeat samples &gt;2x10^6</td>
<td>Rejected</td>
<td>37 (74%)</td>
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<tr>
<td>Total</td>
<td></td>
<td>50</td>
</tr>
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*According to Goldenberg and Elliot (1973).

Fig. 1. SPC of raw chevon samples