Microbiological Quality of Marketable Raw Goat Meat in Jaipur City and its Public Health Significance

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ABSTRACT

A study was conducted to assess the microbiological quality i.e. total viable and coliform counts, and presence of *E. coli*, *Staphylococcus aureus* and *Salmonella* of 50 raw goat meat samples collected from hotels and retail meat shops of Jaipur, Rajasthan. Of the 50 samples only 36% (18) showed acceptable levels of total viable counts, while 58% samples were positive for coliforms. *E. coli* and *staphylococcus* were present in 76% and 70% samples, respectively, whereas none of the samples was found positive for the presence of *Salmonella*.

Keywords: Chevon, meat shops, microbiological quality

Meat and meat preparation have occupied a unique position in human diet and is one of the most nutritious foods used for human consumption. Meat and meat products are prone to endogenous and exogenous microbial contamination causing diseases in the consumers and act as an important vehicle for the transmission of a number of microorganisms which causes food poisoning in man (Bachhil, 1985). The public health problem assumes greater magnitude in India where prevailing temperature and humidity are optimum for growth of microbial multiplication and survival. Microflora for fresh meat has been shown to consist of *Micrococcus* spp., *Streptococcus* spp., *Clostridium* spp., and *Bacillus* spp. (Bachhil. 2000) etc. The present investigation was undertaken to assess microbial quality of raw goat meat.

Fifty samples of raw goat meat (chevon) were collected from different hotels and butcher shops of Jaipur city. Ten grams of each sample was homogenized in 90 ml sterile normal saline solution (NSS). Ten fold dilutions up to the $10^{-6}$ were prepared. Appropriate dilutions were inoculated into the plate count agar using pour plate technique to estimate total viable count (TVC). MacConkey agar and eosin methylene blue (EMB) agar were used for the isolation of *E. coli*, violet red bile agar (VRBA) for coliform count and mannitol salt agar (MSA) was used for isolation of *Staphylococcus* spp. For isolation of *Salmonella*, buffered peptone water was used as pre-enrichment broth, tetrathionate broth/selenite cystine as enrichment medium and brilliant green agar (BGA) as selective medium.

The present estimation of microbial load on chevon sample showed log$_{10}$ TVC range from 5.04 to 7.97 (average of 6.67±0.12). The result is in accordance with findings of Kumar and Bist (2003) who reported plate count of 7.8 log$_{10}$ cfu/g among chevon samples. The average count in the present study was within the standard acceptable microbial limits of 6.69 as suggested by Rao (1986), moreover, 36% of chevon samples were found to be within the acceptable range of microbial counts as per ICMSF (1974) and...
Prevention of Food Adulteration Rules (1955). Higher levels of contamination have been documented by Chaubey et al. (2004), Nanu et al. (1990), Pattnaik et al. (1997) and Amin and Borah (2002). However, other studies reported low microbial load and considered 80-100% samples as satisfactory and of acceptable grade (Murthy and Bachhil, 1980; Bachhil, 1985 and Pawar et al., 2001).

The coliform count ranged from >900 to >6x10^3/g with 50% samples being positive. Chaubey et al. (2004) also found 52.5% unacceptable for coliform, while another study observed 100% meat samples to be of satisfactory grade (Bachhil, 1985). This could be due to differences in hygienic conditions.

Examination for staphylococcal count revealed 35 (70%) samples positive, while Mousa et al. (2000) observed only 11% sample positive for staphylococci, where as Chaubey et al. (2004) found 100% samples in unsatisfactory category. Such high prevalence of staphylococci in meat sold in local meat shops could be due to poor environmental sanitation and poor personal hygiene of handlers.

Thirty eight (76%) raw goat meat samples were found positive for E. coli. Earlier, Sinha and Mandal (1977) and Amin and Borah (2002) observed E. coli in 57% goat meat samples, whereas, Chaubey et al. (2004) recorded 100% contamination.

None of the meat samples recorded the presence of Salmonella spp. These results are in agreement with findings of Singh et al. (1996), Rajmallah et al. (1989) and Chaudhary and Tiwari (2006). However, Das et al. (1990) and Bachhil and Jaiswal (1988) reported Salmonella from meat samples. Any number of Salmonella are not permissible in foods and mere presence in enough to reject the samples.

Poor microbiological quality recorded in this study emphasizes need to undertake urgent measures for hygienic control.

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References