

Original Research Article

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Quality Assessment of Microbial Load in Raw Poultry Meat from Retail Meat Outlets of Bikaner

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ABSTRACT

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Contaminated raw meat is one of the main sources of food-borne illness. Chicken carcasses have higher pathogenic and spoilage bacterial counts than most other foods, where carcass can be contaminated at several points throughout the processing operation during scalding, de-feathering and evisceration as well as cross contamination from other birds and processing equipment. A wide range of possible microorganisms are transmitted by meat to human beings but fewer are likely to have a major impact on public health. Several indicators can be useful to evaluate hygiene level of meat such as Aerobic Plate Count and total psychrotrophic counts. Aerobic Plate Count is considered as an index of quality, which gives an idea about the hygienic measures during processing and help in assessing the keeping quality and psychrotrophic plate counts have been used as a general indicator of the potential shelf life of fresh chicken. In the present study 50 raw poultry samples were collected from various retail meat outlets of Bikaner city and the mean standard plate count and total psychrophilic count for them was determined that was 1.51×10^6 cfu/gm and 1.52×10^4 cfu/gm, respectively.

Introduction

Poultry, or domestic birds, are raised for their meat and eggs and are important source of edible animal protein that accounts 30% of global meat consumption. The popularity of poultry meat has been on the rise during the last two decades and is the most popular meat from any single livestock species. Poultry is a food that has been highly appreciated by man since time immemorial and it is a good source of protein, vitamin B12 and minerals, such as iron, selenium and zinc. Poultry meat is also

rich in the omega-3 fats and is an important provider of the essential polyunsaturated fatty acids (PUFA), and animal protein (FAO, 2010).

Contaminated raw meat is one of the main sources of food-borne illness. Food poisoning diseases are continuing problem of high magnitude in both, developed and developing countries. The pathogens transmitted through food contribute 30 percent to globally emerging infections (Carlin *et al.*, 2009). In all over the world, morbidity and mortality

are attributed to gastroenteritis, due to food borne diseases which pose a serious threat to public health.

The meat, available at retail outlets comes through a long chain of slaughtering, and transportation, where each step may pose a risk of microbial contamination. Chicken carcasses have higher pathogenic and spoilage bacterial counts than most other foods, where carcass can be contaminated at several points throughout the processing operation during scalding, de-feathering and evisceration as well as cross contamination from other birds and processing equipment. Psychrophilic bacteria are important spoilage microorganisms in many chilled meat and meat products that are kept at low temperature in which they become the dominant microflora during faulty chill storage (Gram, 1993).

In India, only a few slaughter houses are registered where proper ante-mortem and post mortem examination of food animals is carried out to safeguard the health of consumers. There are high chances that meat being sold may have heavy microbial load as no standard procedures are carried out ever for evaluation so this field needs a detailed investigation on microbial load and extent of hygiene being followed in unregistered retail shops.

Materials and Methods

The present study was conducted at the Department of Veterinary Public Health, College of Veterinary and Animal Science, Rajasthan University of Veterinary and Animal Sciences, Bikaner, India

A total of 50 raw poultry meat samples were collected for the present study from retail meat outlets of Bikaner city. About 10-20 grams of raw meat samples were collected in

sterilized test tubes and immediately brought to the laboratory under cold conditions. The samples were processed within 4-6 hours of collection. The Standard Plate Count (SPC) of raw poultry samples was done by using pour plate method as per the American Public Health Association (1992). Method used for psychrophilic count of meat samples were similar as described earlier in total viable count method but the inoculated plates are incubated at 10°C for 7-10 days.

Results and Discussion

A total of 50 raw poultry meat samples were collected from various retail meat outlets of Bikaner city during the present study for the evaluation of microbial load by standard plate count (SPC) and total psychrophilic count.

In the present study the mean standard plate count (SPC) for all the 50 poultry meat samples was 1.51×10^6 cfu/gm (Figure-1) and the mean total psychrophilic count (TPC) was 1.5×10^4 cfu/gm (Figure-2). Mean total of Standard plate count and Mean total of total psychrophilic count of the samples are given in table-1.

del-Rio *et al.*, (2007) recorded the mesophilic aerobic bacteria count to be 1.1×10^5 cfu/gm which is less than present study also recorded slightly higher psychrophilic bacterial count at 2.15×10^4 cfu/gm than present study. Javadi and Safarmashaei (2011) reported the mean value of total bacterial count to be 1.21×10^5 cfu/gm which is less than the present study. Sengupta *et al.*, (2011) observed the standard plate count of poultry samples from semi urban markets to be 2.44×10^6 cfu/gm and from urban markets at 6.96×10^5 cfu/gm. Bhandari *et al.*, (2013) recorded the highest counts for aerobic plate count as 3.2×10^{11} cfu/gm that suggested poor food hygiene practices and poor sanitation which was recorded more than present study further,

Ilbrahim *et al.*, (2015) reported the mean value of total bacterial count as 1.2×10^6 cfu/gm and observed psychrophilic count as 2.05×10^3 cfu/gm which is lower than that of present results.

Table.1 Mean standard plate and psychrophilic counts

S. No.	Mean total of Psychrophilic count/gm of meat	Mean total of SPC/gm of meat
1.	1.52×10^4	1.51×10^6

Table.2 SPC of raw meat samples according to ICMSF (1974)

Range of SPC/gm of meat	Grade	No (%) of raw poultry meat samples collected from various meat outlets
$< 1.0 \times 10^5$	Acceptable	4 (8%)
$> 1.0 \times 10^5$ to $< 1.0 \times 10^6$	Marginally Acceptable	18 (36%)
$> 1.0 \times 10^6$	Rejected	28 (56%)
Total No.		50

Fig.1 Standard Plate Count (SPC) of raw poultry meat samples



Fig.2 Psychrophilic count of raw poultry meat sample



Hassanien *et al.*, (2016) reported 2.61×10^3 cfu/gmpsyrophilic count which is also lower than the present investigation. Zafar *et al.*, (2016) investigated aerobic plate count of chicken meat samples from different local meat retailer shops in Karachi and reported it as 4.6×10^6 cfu/gm which is higher than present study. As per ICMSF (1974) the 4 samples included in acceptable grade, 18 samples included in marginally acceptable grade and 28 samples included in rejected grade (Table-2). The highest number of samples was included in rejected grade because of poor hygienic conditions and difference in microbial profile of various poultry samples.

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