FOOD SCIENCE RESEARCH JOURNAL;
Volume 2 Issue 1
(April, 2011) Page : 20-22

RESEARCH ARTICLE

Received : December, 2010; Accepted : January, 2011

Microbial assessment of panipuri –A popular street food of India and its comparison with homemade food

D.G. SOLANKI AND N.R. DAVE

ABSTRACT

Detection of pathogenic bacteria in food helps in controlling food borne infections, this is important from view of health point. While estimating the level of bacterial population in food allows us to assess the shelf-life of food and its mode of storage. This is important from economic point of view as spoilage of food in food processing industries results in great economic loss. Numerous factors contribute to load of microbes in food and food products. Bacteriological quality of raw materials, preparation environment and subsequent storage environment, significantly influence the bacteriological quality of finished products. The microbial tests on food may be quantitative to detect total number of organisms or qualitative to identify certain kinds of organisms. The number of Gram$^+$ and Gram$^-$ bacteria were more in vended panipuri as compared to home made. The bulk of food borne illness is associated with microbiological contamination of foods. This study is of quantitative detection of microorganisms in panipuri.

Solanki, D.G. and Dave, N.R. (2011). Microbial assessment of panipuri –A popular street food of India and its comparison with homemade food, *Food Sci. Res. J.,* **2** (1) : 20-22.

Key words : Vendor's food, Home made food, Hygienic practices

INTRODUCTION

Panipuri is a popular street food and it is crowned as king of evening snack. This snack consists of three separate items *i.e.* pani, puri and masala. Samples of panipuri were collected from four different food zones of Rajkot city and their microbial assessment was carried out and was compared with homemade panipuri. The assessment was done in terms of total microbial load present per sample and presence of enteric group of organisms (Goyle, 1994). As it is popular in Gujarat, so attempts were carried out for necessary awareness amongst the consumers and necessary remedial actions to prevent the same during its preparation and serving can be suggested (Tamhane, 1978).

The food processing and its distribution should strictly follow the microbial standards devised by government agencies of the country. Moreover, it should be ascertained by these agencies from time to time that foods, commercially available meet the standards as devised by these agencies. These tests are concerned with sanitary aspects of food *i.e.* fitness and especially healthfulness of consumption.

These types of studies are chiefly interested with quality control tests for their raw materials and ingredients and line samples during handling and processing as vigilance on these foods and warning for possible troubles. They ascertain whether such food meet the bacteriological standards (if such standards exist), the keeping quality of food is acceptable and to ensure no harmful microbes or their products which are injurious to human health are allowed to exist in the finished product. Now-a-days a phenomenal increase has been observed in the availability and consumption of vendor's food. This has necessitated the need for such type of studies.

MATERIALS AND METHODS

The food items were collected from different food zones of the city. These samples were collected and packed in sterile plastic containers. Thereafter, these samples were individually homogenized in the mixer and packed immediately in the containers. These containers were stored at -34^0 C in the freezer. Homemade food

samples were also standardized, prepared, homogenized and preserved along with these samples.

Next day at 9.00A.M. these, samples were analyzed to determine the microbial count of each sample. Enumeration of organisms was done by standard plate count method. Selection of media was done keeping in mind the different types of microorganisms that may be present in these food samples. One was nutrient agar, which is routinely used in laboratories for general cultivation and isolation of microorganisms. Other was Macconkeys agar used for cultivation and isolation of enteric group of organisms (Gunasekaran, 1987). Observations were made for hygienic practices as compared to homemakers such as; wearing clean clothes, apron and hair cap, washing hands, nails cut, smoking during work, chewing betel, splitting near by, scratching nose while work.

As per the above observation of the samples collected, it was observed that the various nutritive properties have got variations in their values, but after applying the scientific statistical tools (t-test) on the same data (Pal, 2005).

RESULTS AND DISCUSSION

By the help of above mentioned methods the total microbial count of all samples were obtained as shown in the Tables 1-3.

The number of CFU / 1.0 ml was very high in vended food as compared to the homemade. The different types of microbial organisms found in it are:

Spore former are organisms which can enter food through dust and air in the environment where food is prepared and served (road side stalls). As these are highly resistant, their presence in food is a matter of concern for health. The number of gram negative organisms present in food was high almost double of that present in home made food (Table 1 and Fig. 1). These organisms showed 100% viability when grown on MacConkey's agar medium indicating chances of presence of infectious coliforms group of microorganisms. These coliforms were not present in homemade food strongly supporting its consumption as compared to the vended food (Table 2). Again the chances of entry of these coliforms into the food are from use of contaminated water or water from unhealthy places.

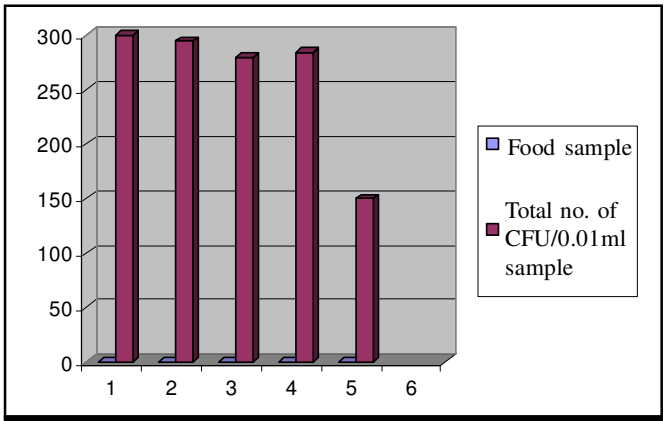

Fig. 1: Comparative No. of CFU/0.01ml of Panipuri from different area and homemade

Table 1 : Result of standard plate count in Panipuri

Food sample	Total No of CFU/0.01ml	Gram staining Randomly selected colonies (% Viable count)				
		Spore formers	Yeast cells	Gram-ve rods	Gram +ve cocci	
					in bunch	in chain
Sample 1	300*	10	–	50	25	20
Sample 2	295*	09	–	45	20	15
Sample 3	280*	08	–	50	22	18
Sample 4	285*	10	–	48	24	16
Homemade	150	05	–	25	15	05

* S =Significant, (T- value <0.05)

Table 2 : Coliform count in Panipuri

Food sample	TNC CFU / 1ml food sample	Gram staining Gram –ve short rod (Presence %)
Sample 1	2×10^2	100*
Sample 2	1×10^2	100*
Sample 3	2×10^2	100*
Sample 4	1×10^2	100*
Homemade	-	-

* S =Significant, (T- value <0.05)

The number of gram positive cocci in bunches or in chain was also high in vended food as compared to homemade food. Presence of these microorganisms in food clearly indicates the unhygienic means / practices of the person who are employed or engaged in the preparation of such foods. Also the microorganisms can enter through improperly cleaned vessels, leftover food particles in the corners, orifices of the vessels used for preparation and storage of such food materials.

Thus, vendor's foods microbial profile being high is

Table 3 : Hygienic and sanitation observation or sanitary practices (Panipuri)

Sr. No.	Details	No. of Vendor's out of (4)	Home made only (1)
Hygienic practices			
1.	Wearing clean clothes	1	1
2.	Using apron and hair cap	1	1
3.	Washing hands before preparation	-	1
4.	Nails cut and while sneezing and coughing	1	1
Unhygienic practices			
1.	Smoking during work	1	-
2.	Chewing betel	2	-
3.	Spitting near by	1	-
4.	Scratching/picking nose while work	1	-

declared unsafe for consumption. The breakdown of sanitation may be responsible for it as none of the vendors maintained hygienic practices. To provide safe and quality products to their consumers, they should adopt hygienic practices and leave unhygienic practices. Such contaminated food articles may cause various food borne diseases among the consumers. Thus, homemade food is safer.

The practices like smoking, chewing of tobacco, beetle etc. are common in vendors. As during this type of activities, there is a constant movement of lips and tongue and talking while doing this work, chances are there that few organisms present in oral cavity of mouth are released in air and from there they can settle on food thereby contaminating it. During sneezing when droplets in form of fluid are released into environment, settle on dust and this dust may later on contaminate food. Whenever a person sneezes or coughs or spits in that area or in the near vicinity, there are chances of releasing microorganisms, which may be directly or indirectly settle on food contaminating it. The bulk of food borne illness is associated with microbiological contamination of foods (Table 3).

REFERENCES

Goyle, A. (1994). Microbial evaluation of three canteen snacks foods, *J. Indian Food Packer*, **31** : 166- 167.

Gunasekaran, G. (1987). *Laboratory manual in microbiology*. CRC Publishing, Florida.

Pal, N. (2005). *Statistics concept and applications*, Prentice Hall of India Private limited, New Delhi.

Tamhane, D. (1978). Microbial contamination and control, *J. Indian Food Packer*, **29** : 47-50.

Address for correspondence :
D.G. SOLANKI
Department of Home Science,
M.V.M. Science and Home Science College,
Saurashtra University
RAJKOT (GUJARAT) INDIA

Authors' affiliations :
N.R. DAVE
Department of Home Science,
M.V.M. Science and Home Science College,
Saurashtra University
RAJKOT (GUJARAT) INDIA