

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

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ABSTRACT

Bhel is a popular street food it is crowned as king of evening snack. Bhel is again a food prevalent in Gujarat used for tit-bit among children and teenagers. A combination of roasted puris of wheat mixed with masala prepared from mashed potatoes, Bengal gram, onion, sev, salt, papper and rock salt. A novel combination may contain pomegranate also, served with chutney of mint and tamarind. Samples of Bhel were collected from four different food zones of Rajkot city and its microbial assessment was carried out and was compared with homemade Bhel. The assessment was done in terms of total microbial load present per sample and presence of enteric group of organisms. 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.

Key Words : Vendor's food, Home made food, Hygienic practices, Nutrient agar, MacConkeys Agar

INTRODUCTION

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.

METHODOLOGY

The food items were collected from different food zones of the city was freshly prepared. These samples were collected 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^o C in the freezer. Homemade food sample were also Standardized prepared, homogenized and preserved along with these samples.

Next day at 9.00 A.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.

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 is 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. It is observed from the analysis that the calculated value is more/less than the tabulated value (approach p value); therefore the hypothesis is accepted or rejected.

RESULTS AND DISCUSSION

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

The number of spore formers was high in vended food, almost double of what is present in homemade food. The few numbers, which is present in home made food, may be attributed to the dry, uncooked material, which is used in this preparation. As some of the food constituents who are used as such them way they are marketed. But same food from vendors the population of spore formers doubles.

This may be because of its being contaminated by dust and dirt, a common place where spores of organisms can survive for long durations. Thus vended food is contaminated with dust and dirt from roads, where it is generally available. Yeast is not present indicating absence of pathogenic or non-pathogenic fungi.

The number of gram negative rods present is also high in vended food as compared to home made food.

The organisms when grown on MacConkeys agar medium show 100% viability in vended food. Where as homemade foods are not showing any of such contaminants. Thus the vended food is contaminated with viable gram -ve short rods, which may be pathogenic. The source of contamination can be water, which is used in preparation of such food.

The number of gram positive Cocci in bunches and chain is also high about 3 to 4 times more as compared to home made food. Its source can be attributed to the unhygienic and unhealthy environment where food is prepared.

Thus, vendor's foods microbial profile being high is 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

Table 1 : Result of standard plate count in Bhel

Food Sample	pH	TNC CFU / 1ml food sample	Gram staining Randomly Selected Colonies (% Viable count)				
			Spore Forms	Yeast Cell	Gram -ve rods	Gram +ve Cocci	
						In bunch	In chain
A	5.1	295 x10 ^{2*}	15	-	50	15	17
B	5.0	250 x10 ^{2*}	10	-	40	20	19
C	4.9	275 x10 ^{2*}	12	-	45	25	21
D	4.5	260 x10 ^{2*}	15	-	47	22	22
HM	5.9	190 x10 ²	07	-	30	05	05

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

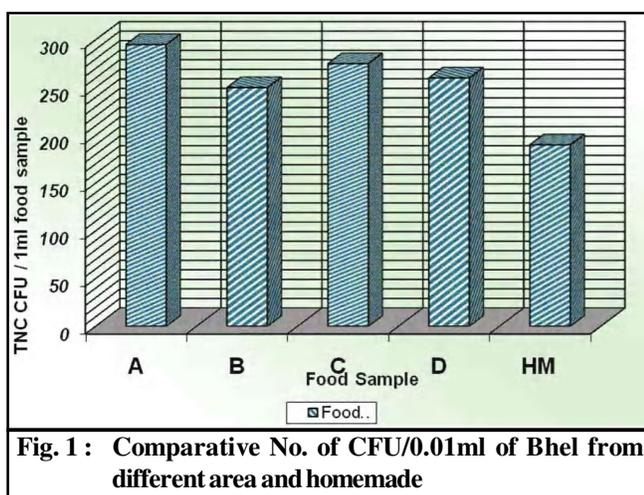
Table 2 : Coliform count in Bhel

Food Sample	TNC CFU / 0.01 ml Food sample	Gram staining Gram -ve Short rod (Presence %)
A	10 x10 ²	100*
B	7 x10 ²	100*
C	5 x10 ²	100*
D	8 x10 ²	100*
HM	-	-

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

Table 3 : Hygienic and sanitation observation or Sanitary practices (bhel)

Sr. No.	Details	No. of Vendor's (Out of four)	Home made (Only one)
1. Hygienic practices			
(a)	Wearing clean clothes	1	1
(b)	Using apron and hair cap	1	1
(c)	Washing hands before Preparation	-	1
(d)	Nails cut and while sneezing and Coughing	1	1
2. Unhygienic practices			
(a)	Smoking during work	1	-
(b)	Chewing betel	2	-
(c)	Spitting near by	2	-
(d)	Scratching/picking nose While work	1	-



diseases among the consumers. Thus, homemade food is safer

The practices like smoking, chewing of tobacco, beetle etc. As during this type of activities there is a constant movement of lips, and tongue and talking while doing this work, chances are there 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.

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