

Nutritional and hygienic assessment of paubhaji sold by small vendors in Rajkot city and its comparison with some made sample

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Paubhaji is a popular food, it is crowned as king of evening snack or dinner. As a general pattern, it composed of a Paubhaji base vegetables and made from fermented batter of Maida. Paubhaji served with different toppings of vegetables and butter. Sample of Paubhaji were collected from four different food zones of Rajkot city and its microbial analysis, nutritional analysis and hygienic practices were carried out and was compared with home made Paubhaji. The analysis was done in terms of total microbial lode 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

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INTRODUCTION

In today's world of globalization we can see globalization in food habits also. Fast junk food is preferred by children. Paubhaji is one such food available in different types.

As a general pattern, it composed of a Paubhaji base vegetables and made from fermented batter of Maida. Paubhaji served with different toppings of vegetables, batter. Food is the usual vehicle for meeting the need for nutrients, but foods differ in their nutrient content. No one food can be depended upon to provide all the nutrients necessary for normal growth and health. Nutritive value refers to the nutrient content of a specific amount of food. Nutrients promote health by making possible the normal operation and maintenance of the body.

Role of micro-organisms in food are spoilage and food

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poisoning. Micro-organisms are found throughout the natural environment which contain micro-organisms is public health concern. People eat street foods these are cheap, convenient and save the time. Economics of scale plus high cost of cooking fuel often make street foods cheaper than food prepared at home.

METHODOLOGY

Food samples were collected from the four main areas in Rajkot city, freshly prepared food samples were collected from four different food zones of city like (1) Indira circle, (2) Bhaktinagar circle (3) Sant Kabir road (4) Race Course ring road.

All vendors were asked about approximate amount of ingredients used in cooking of 5 kg food items. On bases of that amount raw ingredients for 100 g of food was calculated.

Generally middle and higher middle class people of Rajkot city prepared the above selected items at home. Fifty middle class families were given a questionnaire to find out the ingredients and correct method of cooking of above mentioned Paubhaji. On the basis of the results of questionnaire, the average ingredients were obtained and a recipe was standardized.

Table A. Ingredients and amounts for vendors and standardized home made Paubhaji

Ingredients	Amounts in (100 g)	
	Vendor's foods (g)	Standardized home made foods (g)
Potato	7	12
Tomato	5	10
Onion	5	5
Cabbage	10	5
Cauliflower	7	7
Bens	3	5
Brinjal	-	2
Gourd	-	2
Oil	15	10
Butter	1	5
Garlic (dry)	2	1
Lemon	-	5
Spices	10	3
Water	15	7
Wheat flour (refined)	20	20

After standardizing home made recipes for ingredients and amount they prepared were compared with vendor's food samples for nutritional and microbial quality and observation of the hygienic practices.

Nutritional content of home made food was rich as it contained large amount vendors food contained cabbage a cheap ingredient widely available (Table A).

Sample selection and preparation for nutritional analysis:

All the food items that were collected were freshly prepared by vendors.

All the food samples were collected at 10:00 p.m on first day and packed in plastic containers. After this, these samples were individually homogenized in mixer and 100 g sample was packed immediately in containers. These containers were stored at -34°C in freezer. Home made food sample were also prepared, homogenized and preserved along with samples collected from vendors. The chemical analysis was carried out, next day at 9.00 A.M.

Sample preparation for microbial analysis:

From each of the homogenized food samples exactly 1 g food sample was weighed and suspended in 9 ml of sterile distilled water blank. This was considered as 10¹ dilutions. After which serial dilutions 10², 10³ were prepared and 10³ dilutions were selected for inoculation of bacteriological media.

Hygienic practices:

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.

Statistical analysis:

As per the above observation of the samples collected, it was observed that the various nutritive properties have got variations in their values, after applying the scientific statistical tools (t-test) on the same data. It was observed from the analysis that the calculated value was more/less than the tabulated value (approach p value); therefore, the hypothesis was accepted or rejected.

Method for nutritional analysis of food:

Next day at 9 A.M, these samples were analyzed to derive nutritive values in laboratory. Carbohydrates, protein, fat, fibre, moisture, pH, calcium, iron, sodium, potassium, vitamin B₁, B₂, niacin, and vitamin C were estimated. Total carbohydrates by Anthrone method, (Sadashivam and Manickam, 1991), fat was analyzed by AOAC (1970). Total proteins, ascorbic acid by (Sadashivam Manickam, 1991). Calcium was determined by titrimetric method (AOAC, 1970). Sodium, potassium were determined in aqueous solution of ash sample (Jackson, 1973). Colorimetric method using 20 per cent KCNs and 2N Hcl determined iron.

OBSERVATIONS AND ASSESSMENT

By using above mentioned procedures, different nutrients were analyzed. The nutrient content of all samples are shown in the Table 1. All these values are from 100 g of sample.

From the result (Table 2), it is observed that amount of carbohydrates; proteins were more in homemade food as compared to vendor's food because homemade food contains

Table 1. Nutritional value of Paubhaji (100g) for macro nutrients

Nutrients	Areas				
	A	B	C	D	Home Made (HM)
Carbohydrates (g)	10.00*	11.00*	8.00*	11.00	12.00
Protein (g)	1.20	1.30	1.20	1.90*	6.40*
Fat (g)	16.00*	17.00	15.00	17.00	18.00
Fibre (g)	0.10	0.01*	0.09*	0.08*	0.10
Moisture (%)	60.00*	62.00	61.00	60.00	56.00
Ascorbic acid (mg)	0.05	0.04*	0.45*	0.40	1.00*
Calcium (mg)	25.00*	26.00	16.90	18.00	30.00
Iron (mg)	0.12	0.12*	0.04	0.03	0.08
Sodium (mg)	14.50	14.00	12.00*	13.00	13.00
Potassium (mg)	25.00*	26.00*	18.00*	20.00*	26.00

* S= Significant

Table 2. Standard plate count method (Paubhaji)

Food sample	pH	TNC CFU / 1ml food sample	Gram staining randomly selected colonies (% viable count)				
			Spore forms	Yeast cells	Gram -ve rods	Gram +ve Cocci	
						In bunch	In chain
A	4.4	380x10 ²	50	10	120	130	50
B	4.5	300 x10 ²	30	15	100	100	30
C	4.5	305 x10 ²	50	20	80	120	40
D	4.2	290 x10 ²	40	15	100	90	40
HM	4.5	150 x10 ²	10	10	40	20	05

more amounts of vegetables and butter but vended sample more cabbage. Moisture content of homemade sample was least in all food samples as more vegetables and butter were used. Other nutrients were more in homemade sample than other samples.

Microbial analysis of food sample:

Food contains a large number of microbial organisms, which enter into it through the various ways like by ingredients used, handling and preparation.

Table 3. Macconkey's agar

Food sample	TNC CFU / 1ml food sample	Gram staining gram –ve short rod (% viable count)
A	1 x10 ²	100
B	2 x10 ²	100
C	1 x10 ²	100
D	1 x10 ²	100
HM	-	-

Table 4. Hygienic and sanitation observation or sanitary practices

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

The sample was collected from 4 different places and their microbial population was assessed and correlated with that of home made food.

The number of spore formers present in vended food was very high, almost five times to that of home made food (Table 2). These spore formers generally are acquired from dust, which is most prevalent in conditions, environment where these foods are prepared. The spore formers can easily survive in dust, for longer periods of time and also in adverse environmental conditions like acidic pH. But when they get suitable environmental conditions, they can germinate and proliferate.

The number of yeast cells present in vended food was also high (minimum 50% more) as compared to home made food. If baker's yeast used in preparation of bread then it may not be harmful. But being a fungus, can easily survive and proliferate at low (acidic) pH. Some yeast can be pathogenic also.

As compared to spore formers and yeasts the number of gram -ve rods, was very high. The growth obtained on N-agar was further confirmed by growing these organisms on MacConkeys Agar medium. As compared to vended food, the number of gram negative bacteria was very less in home made food. On MacConkeys medium, gram negative bacteria were not found in home made food, which clearly indicates that home made food is safe for consumption. Whereas, vended food showed presence of gram negative CFU on MacConkeys agar medium, a clear indication of its being contaminated with coliform group of micro-organisms (Table 3).

This strongly supports, the chances of transmission of intestinal pathogens and reason for infections (gastro-intestinal) on consumption of such contaminated food.

These types of micro-organisms are generally present and they may enter into food preparation via use of contaminated water during different stages of food preparation.

These micro-organisms (gram negative) can be further confirmed by growth on selective media. Thus, it can help us to know which microbial organism (specific genus) is present, so that we can ascertain the chances of type of infection, that can be speeded by such type of contaminated food, when consumed.

The number of gram positive Cocci present in bunch and chain in vended food was also very high as compared to home made food. They were generally 4 to 6 times more in vended foods as compared to homemade food.

These organisms are generally a common inhabitant of human skin. They grow on nasal membranes and skin. As well they are found in gastro-intestinal and urinary tract of warm-blooded animals. Their presence in food indicates unhygienic conditions and practices during its preparation as well chances of water, which is used in preparation being fecal and contaminated.

Only 25 per cent of vendors were wearing clean clothes with nails cut and followed healthy practice of taking precautions during coughing and sneezing. Only 50 per cent of them used aprons and hair cap. None of them had habit of washing hands during preparation.

Chewing tobacco, picking nose was commonly observed and smoking and spitting in near of food preparing zone (Table 4).

Conclusion:

In the present study, knowledge gained through this investigation will help people to understand the importance of food they eat. It will help them in changing their eating practices and motivate them to eat nutritious and hygienic foods. This study will be able to find out nutrients and which microorganisms are present in small vendor's foods. Vendor's food is cheaper, but does not maintain good health. People will know about difference between home made food and vendor's food by this study.

People are provided with scientific knowledge about food they eat; it will be of great help to them and scientific knowledge about vended foods and making choice of food items.

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