

Socio-economic Profile of Street Food Vendors and Quality Evaluation of Samosa and Panipuri in Allahabad City, (UP) India

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Abstract

The present study aimed to correlate socioeconomic profile of street food vendors and the microbiological quality of Samosa and Panipuri served by food vendors in Allahabad City, (U.P.) India. The data were gathered from 21 food vendors using semi structured questionnaires. The results showed that the street food sector is dominated by males, and 28.5% of them attended primary school and only 9% were graduate. 33.3% vendors washed their hands before and after the preparation of food. 76% vending site were found to be dirty but 57% vendors showed clean personal hygiene. A total 33 samples were collected for analysis. 10 water samples were also collected in sterile glass bottles and transported to laboratory within 1 hr. to test for the presence of coliforms. 80% water samples were showed presence of coliforms. The microbiological result of food item showed the presence of Salmonella (75%) in Samosa and 60% in Panipuri, Yeast and Mold (36%) in Samosa and (81%) in Panipuri. The result also showed high content of fat in the range 20-32% in Samosa samples and in case of Panipuri it was 11-16%. It is suggested that regular monitoring of the quality of street foods must be practiced to avoid any food-borne infection in future and used of appropriate frying medium concerning the health of customers.

Keywords: Street vended foods, microbiological quality, yeast and mold count, Salmonella, coliform, hygienic practices.

1. Introduction

In many cities and towns of developing countries, street food vending is a large source of employment (Choudhury *et al.*, 2011). The street food is prepared on the streets and ready-to-eat, or prepared at home and consumed on the streets without further preparation. Street vended food not only appreciated for their unique flavors, convenience and the role which they play in the cultural and social heritage of societies, it also become important and essential for maintaining nutritional status of populations (Dardano 2003). The Street foods provide a source of affordable nutrients to the majority of the people especially the low-income group in the developing countries (Muzaffar *et al.* 2009).

However, microbial contamination of ready-to-eat foods sold by street vendors and hawkers has become a major health problem. Street food vendors are mostly uninformed of good hygiene practices (GHP) and causes of diarrhoeal diseases (Mensah *et al.* 2002), which can increase the risk of street food contamination (Bhaskar *et al.* 2004; Tambekar *et al.* 2009). The vendors can be carriers of pathogens like *E. coli*, *Salmonella*, *Shigella*, *Campylobacter* and *S. aureus* who eventually transfer these food borne hazards to consumers.

Street vended chats like Panipuri and bhelpuri/samosa sold in almost all the cities throughout India. Even though people are aware that food borne diseases could occur due to consumption of street food, the majority disregards these health hazards (Bryan, 1998).

This study was undertaken to observe the quality of food in terms of its hygienic standards for human consumption and to assess the level of microbial contamination in food being available to the community of Allahabad City, (U.P.) India.

2. Material and Method

2.1 Socioeconomic profile of street vendors:

21 street food vendors operating in the major streets, of Allahabad City were randomly selected for the interview to elicit information on their personal hygiene and environmental sanitation. The socioeconomic conditions and hygiene practices were determined using a semi-structured questionnaire and an observation checklist. The following data were gathered: (i) gender, age, education level, experience in food job, income; (ii) sanitary behaviour; (iii) washing practices, serving practices, utensils; (iv) waste disposal, surrounding and environmental condition; (v) personal hygiene.

2.2 Sample collection:

5 locations in Allahabad city were chosen for collection of samples. A total 22 samples were collected for analysis which includes 12 samples of Samosa and 10 samples of

Panipuri for the presence of salmonella. 11 samples each of Samosa and Panipuri were collected for yeast and mold detection. All the samples were collected and transferred in sterile condition to laboratory for microbiological examination. 10 water samples were also collected in sterile glass bottles and transported to laboratory within 1 hr. to test for the presence of coliforms. 6 samples of each Samosa and Panipuri from the same area were collected for the determination of fat and energy value. Samples were collected in the summer season of the year 2013 from March to May. Each food and water sample collected was recorded in the notebook and labelled at the point of collection.

2.3 Microbial analysis:

1ml of each dilution (10^0 , 10^{-1} , and 10^{-2}) of water sample was transferred aseptically into tubes containing 9ml of MacConkey's broth and Durham tube near the flame. Two test tubes were prepared for each dilution. All the tubes were incubated at 35°C for 24 to 48 hours. The lactose fermentation tubes were examined for the production of acid (yellow colour) and gas after 24 to 48 hours of incubation.

Subsequently conventional procedures were used for the identification of bacteria like *Salmonella* species, and for the detection of yeast & mold in the given food sample upon the specific culture media generally in practice.

3. Result and Discussion

3.1 Socioeconomic characteristics of vendors and hygiene practices

The present study includes 21 street food vendors operating in the major streets, of Allahabad City for the interview. Result showed that 52.3% of the persons interviewed was ranged in the age group 25 – 35 years old. With regards to the educational level, 42.8% were of primary school level, while 28.5% attended the high school and only 9.5% were graduate. The average monthly income earning of this activity was ranged from 15,000 – 25,000 Rs. for over 33.3% vendors. Most (42.8%) of the vendors acquired cooking skills from observation, (33.3%) were taught by their parents. 85% vendors were found to be healthy and only 23.8% vendors were found to be with dirty cloths. 52.3% vendors washed their hand after toilet while only 14.2% vendors used detergent for hand washing following 33% used soap. 80% vendors used to serve food items with bare hand and about 66% vendors threw waste water beside the vending site. It was observed that houseflies were present near (57%) of the stalls and (38.0%) vending sites were located in the area with heavy traffic. Not more but 28.5% persons showed interest about receiving the training.

3.2 Assessment of fat and energy value of Samosa & Panipuri

The fat value obtained were in the range 20-32% and energy value in the range 180-290 kcal. The two samples showed highest fat value i.e. 32% and 31.33% and other showed 24.84, 28.42, 20.83, and 23.62% respectively. In case of Panipuri the highest fat values 15.75, 13.00 and 12.00% respectively were found during analysis. Though

the fat values obtained seems to be less than that of fat values obtained from Samosa samples, it is high in case of Panipuri. It was seen that most of the vendors used vanaspati ghee with frying oil. Hence it showed high fat content and assumed to be a good source of energy, but it greatly concerned about health problems. Its intake should be limited as it may create health problems.

3.3 Microbial assessment

In the present study about (80%) of the total water samples collected were indicated by Positive Presumptive Coliform Test. Only (20%) of the samples were negative for PCT. High incidence of coliform, which might be occurring through contaminated water supplies or through poor hand washing and contamination of utensils (Tambekar *et al.*, 2006, 2007).

36% Samosa samples were found to be positive for the presence of yeast and mold and in case of Panipuri 80% sample were positive for the presence of yeast and mold. The high count in Panipuri might be due to the use of poor quality water during preparation, washing and cleaning of utensils which added a large number of yeast and mold count. The reused of 'Papdi' and 'Masala -pani' could be the major source of contamination. The low count in samosa samples is due to the deep frying practices of vendors and whatever the count found may be during storing or slime layer on poorly cleaned utensils might be cause of entry.

In the present study 75% sample of Samosa and 60% of Panipuri were found to be positive for the presence of salmonella. It could have contaminated the foods through contaminated water, sewage and soil, handling of food by infected vendors and consumer in the market place (Adams & Moss, 2002).

4. Conclusion

From the study it is concluded that food contamination in Allahabad City is mainly due to poor water quality and hygiene during food preparation, washing of utensils, poor personal hygiene, peeling of potatoes and preparation of food long before consumption, and crowded and dusty vending location. Vending sites located alongside busy roads with heavy vehicular traffic, which increase air borne particles, or beside waste disposal sites adds to the contamination. These findings demonstrate that the food vended in Allahabad City constitute an important potential hazard to human health. The HACCP strategy has the potential to make a significant contribution in food safety. Provision of education to the vendors and implementation of appropriate hygiene practices would improve food quality.

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