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RESEARCH ARTICLE

VENDORS AND CONSUMERS STATUS AND MICROBIOLOGICAL ANALYSIS OF SOME COMMON FAST FOOD ITEMS OF DIFFERENT FAST FOOD RESTAURANTS IN BARISAL CITY

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ABSTRACT

The study was conducted to determine the present status of producer and consumer of fast food restaurant as well as hygienic condition of different types of Fast food items in Barisal city. Total 150 food samples of 10 items were collected from 24 restaurants and 60 consumers were selected for data collection. Different types of socio economic data collected to assume the present status and perception towards fast food and fast food vendors. The microbiological analysis of fast foods sample was performed by the Plant Pathology Laboratory, BARI regional office, Barisal.18.33% customer was consumed Fast food as singara and 15% Burger. About 30% consumers had knowledge about nutrition and 33.78% in hygiene and only 13.33% had ideas in food borne pathogen. Among them 30% consumed Fast food for Easy access. 26.67% *E. coli* were found in Burger than 20% in vegetable roll, Among *Salmonella* spp. 26.67% found in Sandwich but in Fried chicken, Samosa and Singara items were not contaminated by *E. coli* and *Salmonella* spp. It is necessary to investigate the physical and chemical contamination of the Fast food samples and there is need to develop awareness to consumption knowledge both of the producer and consumer on health, hygiene and safety aspects of preparation, handling and consumption of Fast foods at Barisal city in Bangladesh.

KEYWORDS

BCC (Barisal City Corporation), Shigella agar (SS agar) Singara, *Salmonella* and *E. coli*.

1. INTRODUCTION

Junk food or fast food is the term given to nourishment that can be arranged and served rapidly. While any dinner with low planning time can be thought to be junk food, ordinarily the term alludes to nourishment sold in an eatery or store with preheated or precooked fixings and served to the in a bundled shape for take-out or take-away. The expression "junk food" was perceived in a lexicon by Merriam– Webster in 1951. Outlets might be stands or booths, which may give no safe house or seating or drive-thru food eateries (otherwise called snappy administration eateries) [1]. Establishment tasks which are a piece of eatery networks have institutionalized foodstuffs sent to every eatery from focal areas [2]. A few studies are available on the consumer preferences of fast food products in Bangladesh, convenience, accessibility, and the demand for fast food, promotions of hospitality service; but studies are rarely found on the factors affecting customer hospitality of the fast food industry in Bangladesh. Under this context the present study takes an initiative to conduct an empirical study on this particular issue. This study revealed that the most significant factors affecting the customer hospitality of fast food industry in Bangladesh are greetings, sitting arrangement and speed of service. Pattern of food consumption may vary due to the differences in culture, climate, socioeconomic status, etc. In fact, the habit of taking food among the inhabitants of a country may change due to several factors.

Thus globalization, economic and income growth has led to increased amount of fast food consumption in Bangladesh like any other Asian country. Today fast food restaurant industry is a highly growing sector in Bangladesh [3]. The fast food restaurants are now dominating the world which originates in 1916. With an introduction in Bangladesh at early nineties, several international fast food brands are operating in Bangladesh beside the local fast food restaurants [3]. As the industry is growing, the question of consumer attitude towards the fast food restaurants has become a significant aspect of research. Very often the fast food restaurants and the habit of fast food consumption are becoming the issue of criticism in the local media of Bangladesh due to the adulteration of food items with food colours and other hazardous chemicals, and microbial safety and hygiene of the restaurants. At recent times, the mobile court raided many fast food restaurants at Barisal city in Bangladesh. That's why consumers become suspicious regarding the quality and environment of the fast food restaurants. Thus, it is a necessity to identify the attitude of the fast food consumers towards the restaurants.

Attitudes are evaluative statements, which can be either favourable or unfavourable concerning any object, people, or events [4].

The attitude towards a product or service can be a vital influencer in buying behaviour. In fact, favourable attitude can cause favourable buying decisions [5]. Based on this background, the current study aims to explore the consumer attitude towards the fast food restaurants at Barisal city in Bangladesh. The primary characteristic of fast food is that it is ready made in nature and easy to eat. Fast foods are mostly designed for ready availability, use and consumption. According to Bender and Bender as a "general term used for a limited menu of foods that lend themselves to production-line techniques; suppliers tend to specialize in products such as hamburgers, pizzas, chicken, or sandwiches" [6]. The fast food products are distinguished from others in function of the following characteristics: being low priced, served quickly, usually eaten with the hands, easily packaged, and having a short shelf life. The major reasons of differences between fast food and other foods are (i) the standardized menu and consistent quality minimizes time need to be spent obtaining product information and (ii) usually consumers can combine meal-time with time engaged in other activities such as shopping, work, or traveling [7,8].

Consuming fast foods has become a recent trend among upper society, teenagers and youth have also increased and the fast food has won the palate of those groups in Barisal city. These are also served as helpful purpose in official and private meeting, working people at lunch time and also Tiffin of students [9]. Thus, eating at fast food restaurants not only gives consumers to satisfy their hunger, need for convenience, pleasure, entertainment, time saving, social interaction and the mood transformation but also consumers experience excitement, pleasure and a sense of personal well-being [10]. Examples of the most prominent fast food items include burger, pizza, fried chicken, hamburger and sandwich [3]. Most of the local fast food restaurants are also serving several local, semi-local cuisines, i.e. singara, somucha, chicken or vegetable roll, meat bun, meat or vegetable patties, noodles, etc. along with tea, coffee, juices, and different beverages. Different other food items also can be included according to Akku Choudhury, Executive Director of Transcom Foods Limited. As he told, "fast food as the term for fastest life style of modern society, we have general idea that fast food means MacDonald or Italian Dishes, but it can be local dishes and menus even Biryani/ Chicken Curry can be regarded as fast food, if it is served quickly and saved time for taking" [11].

Thus, it can be concluded that fast food restaurants should be quick service provider with readymade food items. That's why fast food restaurants are also known as Quick Service Restaurants (QSR"s) and fast foods are often termed as Food Away from Home (FAFH) [3]. To fulfil its objective the study includes Twenty-four leading and popular fast food restaurants at Barisal city in Bangladesh to identify the consumer preferences about the restaurants. Specific objectives of the research are:

1. To provide an overall idea of Fast food and the fast food restaurants at Barisal city in Bangladesh.

2. To determine and describe the existing socio-economic, demographic profile food producer and consumer of Fast at Barisal city in Bangladesh.

3. To assessment the knowledge of both of the producer and consumer on health, hygiene and safety aspects of preparation, handling and consumption of Fast foods.

4. Collection and microbial analysis of different Fast food items.

2. MATERIALS AND METHODOLOGY

The experiment was conducted in the area of Barisal City Corporation (BCC) in Bangladesh. The Geographical location of the Experimental area was at 22° 48' 0" North, Latitude to 90° 30' 0" East Longitude and Altitude 4.0 m above the sea level. The microbiological analysis of fast foods sample was performed by the Plant Pathology Laboratory, BARI regional office, Barisal. The total study was conducted in 30 Ward areas of Barisal City Corporation (BCC) from 1st January 2014 to 10th May 2014.To determine and assume the present status of producers and consumers of fast food; sampling procedure adopted by selecting 24 fast food restaurants and 60 consumers for the baseline survey and the methodology used to collect the required information and food samples for microbial analysis. 24 fast food restaurants, 150 samples were collected randomly for 10 food items and 60 consumers included in the present survey were therefore a purposive sample chosen primarily to represent some of the key characteristics of different aspects associated with them. The sample size is determined by the area wise population and area wise food restaurants; samples are collected randomly.

The status of vendors and consumers of fast food and microbial quality of selected common fast food items of fast food restaurants were used as the sampling frame. The interview schedule was developed for collecting socioeconomic information, health aspects of fast foods, and environmental aspects of fast food restaurants. After developing the interview schedule, it was pre-tested among five sellers and five consumers and necessary correction were made for the final interview schedules. All the data was collected during January to May 2014 at the 24 fast food restaurants of the producers of whole BCC and usually the respondents are the head of restaurants. I have been directed to stay at the respective region ie. 30 different wards of BCC during the period of data collection so that I can extensively supervise data collection task and address instantly any unwanted problem arising during data collection. Survey results have been analysed in tabular form. Major variable is explained vertically (columns) and cross tabulation by another related variable(s) horizontally. In the analysis, it has been described the variation of the magnitude of the major variables by division.

The final report has been disseminated in a hard copy as book. For microbiological analysis available food samples from the interviewed producer's shops were collected. Meshed food samples were inserted aseptically into sterile cotton plugged conical flask containing .9% sterile sodium chloride solution by using sterile forceps. Three different types of media, which were recommended for the growth of Salmonella and E. coli. The colonies developed on the plates were compared and counted after incubation for 24-48 hours at 37˚c. pH of the media was adjusted to 7.2 prior to sterilization. Inoculated plates were incubated at 37˚c for 24-48 hours to facilitate viable bacterial growth. PDA media was used for culture of E coli. Salmonella and Shigella agar (SS agar) were used for culture of Salmonella. Clear discrete bacterial colonies were picked up by inoculating on fresh and dried agar plates for pure culture. After 24 hours bacterial growth was observed for their purity. Total aerobic plate count was determined according to the AOAC (Association of Official Analytical Chemists; now AOAC International) procedure. Duplicate pour plates of four successive decimal dilution were prepared, counted and calculated. Average counts were expressed as colony forming units per g or ml of sample.

3.RESULT

All of the fast food producers who work to make fast food were male (100%). Nearly 49% of them were aged between 26-35 years (mean about 30.5 years) while 33.78% were aged between 21-25 years. About 44.62% Producer who had HSC and 3.03% were completed J.S.C. No students, private service holder and Public Service Holder were involved in fast food producer. In the Ward number 1-10 only 20% producer was joined with other professions and Ward number 11-30 100% producer was continued as main business. Half of the fast food producers per month income were 10001-20000 taka. There was no any fast food producer in the Barisal city that the income range was above 40000 taka. 25.22% of the fast food producers per month income were 10000 or less. In survey it was revealed that 58.49% fast food producer leased restaurant from others householder to operate their business. In Ward 11-20 18.18% fast food producer performed by their owned restaurant. 35.6% fast food producer operated their business as partnership. 62.5% fast food shops were located near the educational institutions like school and college and no fast food restaurant located at the side of stationary market and 9.1% of fast food restaurant were located near the private company. Most of the producers (69.30%) was run their business as principal business.

One third of fast food producer was engaged in other food vending business as their extra business. No fast food producers was engaged in business as part time. About 73.41% fast food restaurant business was built in developed area of Barisal city. In the fast food restaurant food business it was revealed that 87% served their business for 7 days in a week at residential areas in Barisal city. About 8% fast food restaurant operated their food business for 6 days in a week. Only 5% fast food restaurant operated their food business for 5 days in a week. Most of the restaurant (83.10%) served food to the consumers by some hand equipment's. About 90% of the producer disposed their garbage on the roadside city garbage box and 10% threw them in the others. They used of pacca toilets inside their restaurant. Almost all vendors use toilets tissue and washed their hands using soap water after using the toilet.

The personal hygiene of fast food producers in fast food restaurants was comparatively good in Barisal city. About 69.24% producers in fast food restaurants was vaccinated and 68.71% used head cover and hand gloves at servicing their food items and 83.10% producers in fast food restaurants were cut their nail regularly about 60% respondents of fast food consumer were male and 40% were female. Most of the fast food consumers were aged between 16- 25 years (mean about 20.5 years) while 30% were aged between 26- 35 years and only 1.6% was aged above 46 years. About 35% were married, 46.67% of them were unmarried. 31.67% participants who had passed S.S.C., 30% HSC, 18.33% participants had degree education. Only 10% respondents in Ward 21-30 had MS/MBA Degree education while 0% in Ward 1-10 in this area comprising the lowest percentage in higher education profile among the other three survey areas. In the Barisal city area of Bangladesh 18.33% customer was consumed Fast food as singara and Burger hold the 2nd position (15%). In the Ward 11-20Burger hold first position than others. Knowledge regarding food nutrition of the consumer was comparatively satisfactory. About 80% consumer had well knowledge about nutrition and 85% in hygiene. Food safety, food serving, and other knowledge was good. Through 18.33% and 25% school campaign people said that media and internet was the best way to learn more. 86.67% consumers had no idea about food borne pathogen and 15% told this pathogen sometimes caused disease.

Fast food consumers of Barisal city were student, businessman, govt. officer and general people also. Among them student was maximum (60%) in the Ward 11-20. Businessman hold the second position (40%) in the Ward 01-10. There was no labor and tourist type of fast food consumer in Barisal city. Most of the fast food consumer of Barisal city consumed fast food for easy access (35%) but not as a cheaper. (Figure 3). In an average customer had no good knowledge regarding food nutrition aspect. Only 30% consumers had well knowledge regarding food nutrition aspect. The knowledge on fast food as hygiene aspect to consumer was comparatively good. Prepared fast food samples collected from Fast food restaurant of Barisal city. Some samples showed the presence of *E. coli*. 26.67% *E. coli* were found in Vegetable roll than in 20.33% in Burger, 13.33% in chicken sandwich, 6,67% in Meat kebab and in Singara, Fried chicken and Samosa.

3.1 Microbial Analysis of Fast Food for *E. coli.*

Prepared Fast food samples collected from Fast food restaurant of Barisal city. Some samples showed the presence of *E. coli*. 26.67% *E. coli*, were found in Vegetable roll than in 20.33% in Burger, 13.33% in chicken sandwich, 6,67% in Meat kebab and in Singara, Fried chicken and Samosa.

Table 1: *E. coli.* Test of restaurant Fast food in Barisal city

***E. coli.* test of** Fast food in **Fast food** restaurant									
Food sample test result for *E. coli.*					Food sample test result for *E. coli.*				
Sample size: 05					Sample size: 05				
Characteristics	Ward 1-10	Ward 11-20	Ward 21-30	Mean	Characteristics	Ward 1-10	Ward 11-20	Ward 21-30	Mean
Food item: Burger (%)					Food item: Vegetable roll (%)				
- (ve)	40	20	20	26.67	- (ve)	20	20	20	20
No	60	80	80	73.33	No	80	80	80	80
Food item: Chicken sandwich (%)					Food item: Meat kebab (%)				
- (ve)	20	0	20	13.33	- (ve)	20	0	0	6.67
No	80	100	80	86.67	No	80	100	100	93.33
Food item: Hot dog (%)					Food item: Samosa (%)				
- (ve)	20	0	0	6.67	- (ve)	0	0	0	0
No	80	100	100	93.33	No	100	100	100	100
Food item: Fried chiken (%)					Food item: Singara (%)				
- (ve)	0	0	0	0	- (ve)	0	0	0	0
No	100	100	100	100	No	100	100	100	100
Food item: Pizza (%)					Food item: Patties (%)				
- (ve)	20	0	20	I3.33	20	20	0	0	6.67
No	80	100	80	86.67	60	80	100	100	93.33

3.2 Microbial Analysis of Fast Food for *Salmonella spp.*

Food samples collected from fast food restaurant of Barisal city. Some samples showed the presence of *Salmonella* spp. Among them the type of *Salmonella* spp. of Barisal city was maximum in Sandwich 26.67% but in Fried chicken, Samosa and Singara type of fast food items did not contaminated by *Salmonella* spp. In Barisal city, Meat kebab samples showed fewer (13.33%) *Salmonella spp*

Table 2: Salmonella Test of restaurant Fast food in Barisal city

***Salmonella* test of** Fast food in **Fast food restaurant**									
Food sample test result for *Salmonella.*					Food sample test result for *Salmonella*				
Sample size: 05					Sample size: 05				
Characteristics	Ward 1-10	Ward 11-20	Ward 21-30	Mean	Characteristics	Ward 1-10	Ward 11-20	Ward 21-30	Mean
Food item: Burger (%)					Food item: Vegetable roll (%)				
- (ve)	20	0	20	I3.33	- (ve)	20	0	0	6.67
No	80	100	80	86.67	No	80	100	100	93.33
Food item: Chicken sandwich (%)					Food item: Meat kebab (%)				
- (ve)	40	20	20	26.67	- (ve)	20	0	20	13.33
No	60	80	80	73.33	No	80	100	80	86.67
Food item: Hot dog (%)					Food item: Samosa (%)				
- (ve)	20	0	0	6.67	- (ve)	0	0	0	0
No	80	100	100	93.33	No	100	100	100	100
Food item: Fried chicken (%)					Food item: Singara (%)				
- (ve)	0	0	0	0	- (ve)	0	0	0	0
No	100	100	100	100	No	100	100	100	100
Food item: Pizza (%)					Food item: Patties (%)				
- (ve)	20	0	20	13.33	- (ve)	0	0	20	6.67
No	80	100	80	86.67	No	100	100	80	93.33

4. DISCUSSION

4.1 Discussion onProducer and Consumer status of Fast food restaurant

According to work on "The Case of Fast Food Industry in Bangladesh" [12]. The study was conducted with some basic information of the respondents (vendors and stake holders). The respondents were asked about their gender, age, education levels, occupation and income to assume the socio-economic status. For proper investigation of respondents' as the profile at first they are equally divided into male and female. Most of them (33%) are between 16-25 years, most of them (30%) have completed S.S.C., most of them (40%) are students and most of their (28%) average monthly household income is between BDT 20,001-30,000. In this experiment, the Producers who were joined in fast food Industry in Barisal city all of were male (100%). In this area Women participation in every field of business was limited generally. In this area Women participation in textile type business yet only. Most of them (48.18%) are between 26-35 years. About 44.62% Producer who had HSC was maximum and 3.03% were completed J.S.C. is minimum. As developing country employment opportunity is limited so many educated person involve in Fast Food Industry at Barisal city in Bangladesh.

4.2 Discussion on Microbial Analysis of Fast Food

In microbial analysis it was observed that,87% of the food samples were found to be satisfactory and 13% of the food samples were found to unsafe and may be harmful for human consumption in Barisal city. Total coliform and *Salmonella spp*, count in 18%, 8% samples respectively have crossed the recommended limits and were unsafe and detrimental for human consumption and which is not edible. It was similar that, 84% percent of the samples were found to be passable and 16% of the samples were found to be unsafe for human consumption in Barisal city. Total coliform, and *Salmonella spp*, count in 12% and 16% samples respectively have crossed the recommended limits and were unsafe for human human consumption [13]. In the present study the following points were noted which could be served as the source and cause of microbiological contamination like bare-handed handling of food items, use of unsafe water by food handlers to wash their hands that had been used over and over again. This water could have been a source of coliform and faecal coliform.

Cross contamination may be a cause which is take place by the action between half-cooked and raw meat kept side by side in the same refrigerator may also play role in microbiological contamination. This could have been a possible source of contamination by *Salmonella* also. Keeping food for display in glass boxes for a long time at towering temperatures without refrigeration accredit the bacteria to proliferate to progeny. It is the common and traditional practice of Southeast Asian people to handle food items with bare hands; vendors do not use any cover or pack or tissue paper to handle the food in most cases. Those above factors may be source of common pathogens which may transmitted through bare-handed handling of food are *Salmonella* spp. if food items are contaminated with this organism and the food is kept for a long time in optimum growth temperature. For *Salmonella* species, raw egg is one of the commonest sources of contamination. The pathogen may be introduced from raw materials to final products if the eggs used for the sandwiches are not cooked thoroughly.

5. CONCLUSION

Fast food has increasingly become popular at Barisal city in Bangladesh because of the effect of globalization. A lot of people, specifically the younger generation and juveniles are consuming various types of fast foods everyday as these are convenient, time saving and tasty. Consumers' choice of a particular restaurant depends on many factors, i.e. quality, variation, location, price, environment, and many more aspects of that specific fast food restaurant. Thus, the consumer attitude evaluation is important to explore why a consumer visits a particular restaurant and in this way vendors can easily change the environment and food quality according to the client's demand. The present study is an attempt to find out the differences in consumers' attitude towards selective fast food

restaurants of Barisal city in Bangladesh. To fulfil this objective, the study explores the most frequent salient beliefs of consumers regarding the fast food restaurants in Bangladesh, which are quality, price, quick service, and environment of the restaurants among those the service and behaviour of the restaurant employees is a vital fact.

Based on the salient beliefs, a multi attribute attitude model has been developed and tested in twenty-four restaurants in different Wards Barisal city, which are found as most visited fast food restaurants according to the consumer's opinion. Structured questionnaire survey is conducted on 60 consumers to obtain consumer opinion regarding the strengths and evaluation of salient beliefs. Most consumers showed the most favourable attitude towards Singra than Burger and the least favourable attitude towards Patties, Sandwich, and Hot dog etc according to the study; significant differences are found among these twenty-four restaurants in terms of belief evaluations about quality, price, quick service, and environment. It is also found that consumers have most favorable evaluation about fast food quality and environment, and food price and prompt services. At the end of the paper, some recommendations are made based on the study results.

This was a qualitative study of bacterial contamination for *E. coli* and *Salmonella*. The study was conducted to determine the Fast food restaurant producer and consumer status as well as hygienic condition of different types of Fast food items at Barisal city. A total of 24 shops were selected for data collection 150 food samples of 10 items food were collected. Fast food has increasingly become popular at Barisal city in Bangladesh with the effect of globalization. All of the producers of fast food restaurants were male (100%). 48.18% of them were aged between 26-35 years. About 44.62% completed H.S.C. and their income per month range was (10001-20000) in taka is maximum (51.8%). In an average most of the Fast food restaurant (59%) were located adjacent to educational institutions like schools and colleges. About 90% of the producers disposed their garbage on the roadside city garbage box.

All (100%) of them cut their nail and washed hand regularly before food preparation. About 60% respondents of fast food consumer were Male and 40% were female. Most of the fast food consumers were aged between 16-25 years. The half of the total fast food consumers of Barisal city was student (50%). In the Barisal city area of Bangladesh maximum customers (18.33%) consumed fast food items were Singara and Burger which was hold the 2nd position. About 30% clients had knowledge about nutrition and 33.78% had ideas of hygiene and only 13.33% had ideas about food borne pathogens. Among them 30% was given opinion to consume fast food for easy access. The microbiological status of 50 fast food samples collected from middle class and higher-class retail outlets of fast food shops and restaurants at (Ward no.1-30) of Barisal city were assessed.

The *E. coli* was found (26.67%) in Burger was maximum than in Vegetable roll (20%), among them the type *Salmonella* spp. was maximum in Sandwich (26.67%) but in Fried chicken, Samosa and Singara type fast food items had no contamination by *E. coli*and *Salmonella* spp. It is necessary to scrutinize the physical and chemical adulteration of the fast food samples and there is need to develop awareness to consumption knowledge both of the producer and consumer on health, hygiene and safety aspects of preparation, handling and consumption of fast foods at Barisal city in Bangladesh which should be done in supreme priority.

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