



VENDORS AND CONSUMERS PERCEPTION AND MICROBIOLOGICAL ANALYSIS OF SOME FAST FOOD ITEMS

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[Citation: Md. Atikuzzamman, Md. Amirul Islam, Md. Moniruzzaman (2018). Vendors and Consumers perception and Microbiological Analysis of Some Fast Food Items. *Int. J. Bus. Soc. Sci. Res.* 7(1): 24-29. Retrieve from <http://www.ijbssr.com/currentissueview/14013299>]

Received Date: 26/06/2018

Acceptance Date: 05/08/2018

Published Date: 05/08/2018

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 during January to May 2014. Total 150 food samples of 10 items were collected from 24 restaurants and 60 consumers were selected randomly for data collection. The microbiological analysis of fast foods sample was performed by the Plant Pathology Laboratory, BARI regional office, Barisal. The customer of *singara* was 18.33% and *burger* was 15% consumed as fast food. 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 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.

Key words: BCC (Barisal City Corporation), Shigella agar (SS agar) Singara, and *Salmonella*.

Introduction

Fast food is the term given to food that can be prepared and served very swift with low preparation time. A few studies are available on the consumer preferences of fast food products in Bangladesh, expediency, intelligibility, and the demand for fast food, promotions of hospitality service; but studies are rarely found on the factors affecting consumer's and client's hospitality of the fast food industry in Bangladesh. Now a day's fast food restaurant industry is a highly growing sector in Bangladesh (Islam and Ullah 2010). Originated at USA in 1916, fast food restaurants are now dominating the world (Bareham 1995). With an introduction in Bangladesh at early nineties (Islam and Ullah 2010), several international fast food brands are operating their food business in Bangladesh beside a lot of local fast food restaurants. As the industry is growing, the question of consumer attitude and perception towards the fast food restaurants has become a significant aspect of research to assume and assess the overall phenomena for the wellbeing. Thus it is a necessity to identify the attitude, perception and evaluative statements of the fast food consumers towards the restaurants, which can be either favourable or unfavourable concerning any object, people, or events (Alam and Iqbal 2007). The attitude and perception towards a product or service can be a vital influencer in buying behaviour. In fact favourable attitude can cause favourable buying decisions (Azam 2005). Based on this background, the study aims to

1. Provide an overall idea of Fast food and the fast food restaurants at Barisal city in Bangladesh.
2. Explore the consumer attitude and perception towards the fast food restaurants as well as, determine the existing socio-economic, demographic profile food producer and consumer of Fast at Barisal city in Bangladesh.
3. assessment the knowledge of both of the producer and consumer on health, hygiene and safety aspects of preparation, handling and consumption of Fast foods, and
4. Collection and microbial analysis of different Fast food items.

Materials and methodology

The experiment was conducted in the 30 Ward of Barisal City Corporation (BCC) in Bangladesh during 1st January to 10th May 2014. The microbiological analysis of fast foods sample was performed by the Plant Pathology Laboratory, BARI regional office, Barisal. Sampling procedure adopted by randomly selecting 24 fast food restaurants where 150 samples was collected for different 10 food items for microbial analysis, and 60 consumers selected for the baseline survey. The interview schedule was developed for collecting socioeconomic information, health aspects of fast foods, and environmental aspects of fast food restaurants. Survey results have been analysed in tabular form. In the analysis, it has been described the variation of the magnitude of the major variables by division. Meshed food samples were inserted aseptically into sterile cotton plugged conical flask containing 0.9% sterile sodium chloride

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solution by using sterile forceps. Two 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 to facilitate viable bacterial growth. pH of the media was adjusted to 7.2 prior to sterilization. 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 dilutions were prepared, counted and calculated. Average counts were expressed as colony forming units per g or ml of sample.

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. 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, where as 25.22% of the fast food producers per month income were 10000 or less.

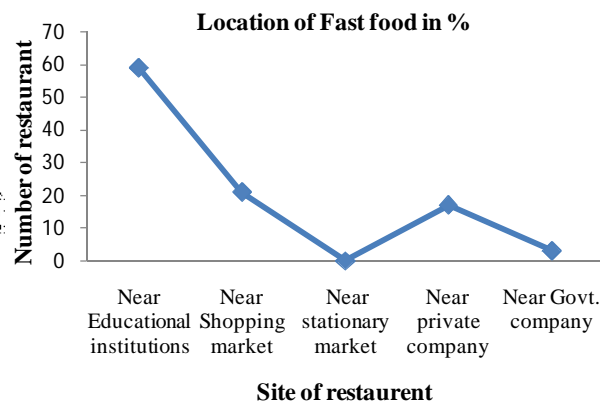
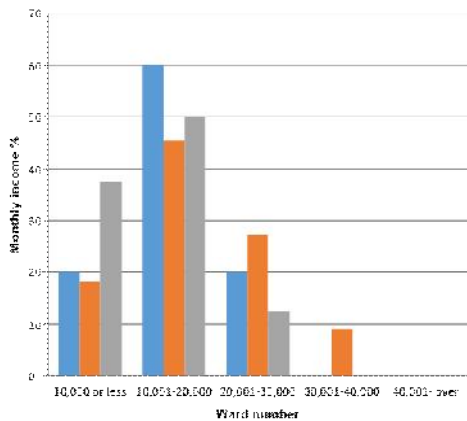


Fig. 01: Income per month of Fast food Producer in Barisal city

Fig. 02: Location of Fast food restaurants in Barisal city

Near the educational institutions like school and college 62.5% fast food shops were located, no fast food restaurant located at the side of stationary market and 19.1% of fast food restaurant were located near the private company. 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. Almost all vendors use toilets tissue and washed their hands using soap water after using the toilet. 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 (Table 1).

Table 01: Water and sanitation profile of the Fast food restaurants

Characteristics	Ward 1-10	Ward 11-20	Ward 21-30	Mean
Where utensils cleaned? (%)				
Kitchen of restaurant	80	81.82	87.5	83.10
Own house	0	18.18	12.5	10.23
Roadside	20	0	0	6.67
Others	0	0	0	0
Type of water used to clean utensils (%)				
Stored water	0	0	0	0
Tap water	20	27.28	25	24.10
Tube well	80	72.72	75	75.90
Pond water	0	0	0	0
Others	0	0	0	0
Garbage disposal (%)				
Dustbin	80	81.82	87.5	83.10
Drain	20	18.18	12.5	16.90
Road side	0	0	0	0
Pond	0	0	0	0
River	0	0	0	0
Others	0	0	0	0

Characteristics	Ward 1-10	Ward 11-20	Ward 21-30	Mean
Toilet used (%)				
Householder toilet	100	81.82	75	85.60
Shop toilet	0	18.18	0	6.10
Own house	0	0	25	8.30
Neighbour house	0	0	0	0
Washing hands after using the toilet (%)				
Yes	100	100	100	100
No	0	0	0	0
Sometimes	0	0	0	0
Washing hands with water after using toilet (%)				
Water only	0	0	0	0
Soap and water	100	100	100	100
Mud	0	0	0	0
Others	0	0	0	0
Washing hand before food preparation (%)				
Always	100	100	100	100
Sometimes	0	0	0	0
Very few times	0	0	0	0
Never	0	0	0	0
Washing hands before food serving (%)				
Always	80	81.82	87.5	83.10
Sometimes	20	18.18	12.5	16.90
Once a day	0	0	0	0
Never	0	0	0	0
Cleaning time of dirty plate (%)				
Morning	0	0	0	0
Night	20	81.82	87.5	83.10
After noon and Night	80	18.18	12.5	16.90
Throughout the day	0	0	0	0
Morning, After noon and night	0	0	0	0

Table 02: Socio-economic and demographic profile of consumer of Fast food in Barisal city

Characteristics	Ward 1-10	Ward 11-20	Ward 21-30	Mean
Sample Size (N)	20	20	20	-
Sex (%)				
Male	60	50	70	60
Female	40	50	30	40
Age (years) (%)				
5 – 15	15	10	5	10
16 – 25	40	50	45	45
26 – 35	25	30	35	30
36 – 45	20	5	15	13.33
46– over	0	5	0	1.67
Marital Status (%)				
Married	50	25	30	35
Unmarried	50	50	40	46.67
Divorced	0	15	15	10
Widow/Widower	0	10	15	8.33
Educational Status (%)				
J.S.C.	20	15	10	15
S.S.C.	30	30	35	31.67
H.S.C.	35	30	25	30
Undergraduate/Bachelor	15	20	20	18.33
Graduate (MBA/MS)	0	5	10	5

About 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 11-20 Burger hold first position than others (Table 2).

Table 03: Items of Fast food consumption in Barisal city

Sl. no.	Fast food items consumption in %	Area			Mean
		Ward 01-10	Ward 11-20	Ward 21-30	
1	Burger	10	20	15	15
2	Chicken Sandwich	5	10	5	6.67
3	Hot dog	10	5	5	6.67
4	Fried Chicken	5	10	5	6.67
5	Pizza	5	10	10	8.33
6	Vegetable roll	15	10	10	11.66
7	Meat kebab	5	0	15	6.67
8	Samosa	15	15	10	13.33
9	Singara	20	15	20	18.33
10	Patties	10	5	5	6.67

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.

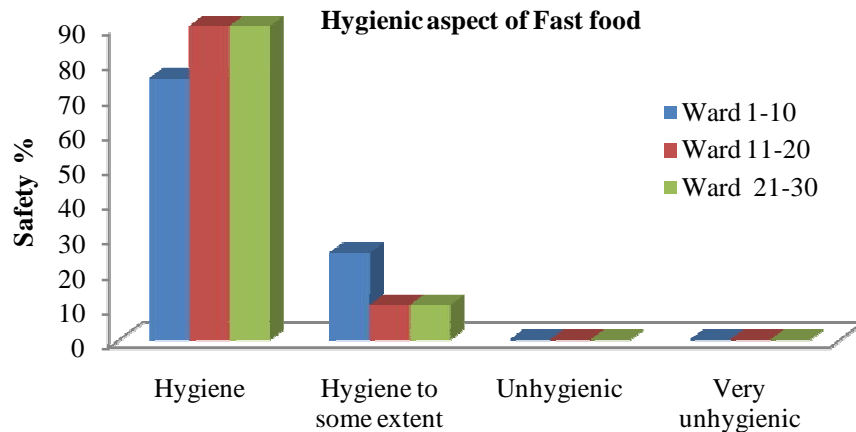


Fig.03: Hygienic aspect of Fast food to Consumer in Barisal city

Most of the fast food consumers of Barisal city consumed fast food for easy access (30%) but not as a cheaper. Only 20% consumers had well knowledge regarding food nutrition aspect.

Table 04: Knowledge regarding food nutrition of the consumer of Fast food

Characteristics		Ward 01-10	Ward 11-20	Ward 21-30	Mean
Where people learn more? (%)	The media	5	10	5	6.67
	Health campaign	15	10	20	15
	School campaign	10	30	15	18.33
	Internet	20	10	20	16.67
	Media and Health campaign	25	25	25	25
	Media and School campaign	20	15	15	16.67
	Health and School campaign	5	0	0	1.66
Best way to learn more (%)	School campaign	25	50	50	41.67
	Put hygiene sign	50	25	25	33.33
	Media and Internet	25	25	25	25
Idea about food borne pathogen (%)	Yes	10	20	10	13.33
	No	90	80	90	86.67
Frequency of causing disease (%)	Always	0	0	0	0
	Sometimes	15	20	10	15
	Very few times	25	30	30	28.33
	Never	60	50	60	56.67
Nutrient supply of Fast food (%)	Sufficient	75	90	75	80
	Medium	25	10	25	20
	Not sufficient	0	0	0	0

Most of the fast food consumer of Barisal city consumed fast food for easy access (30%) but not as a

cheaper. In an average customer had no good knowledge regarding food nutrition aspect. Only (20%) consumers had well knowledge regarding food nutrition aspect.

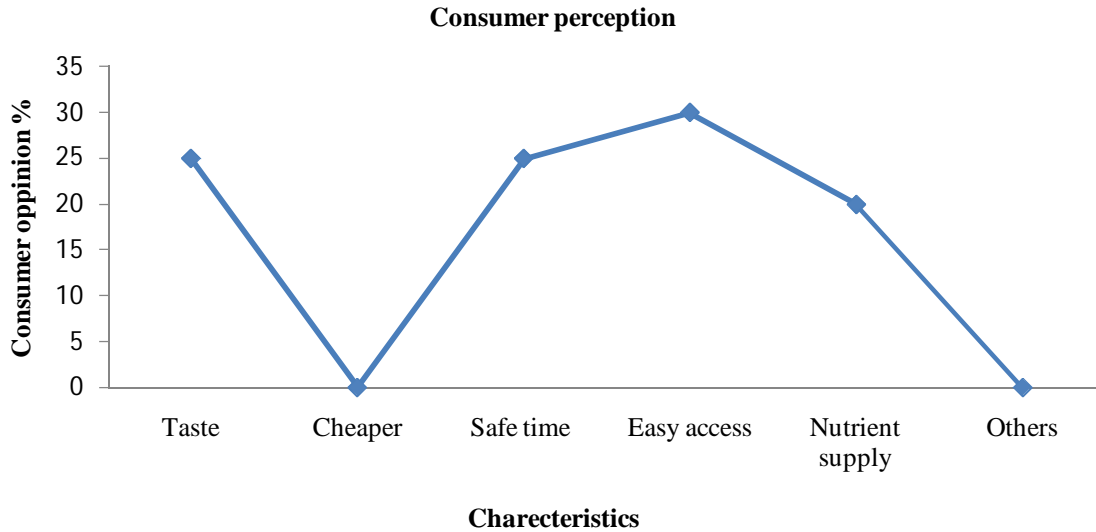


Fig. 04: Choice reasons of consumer on Fast food in Barisal city

Table 5: *E. coli*. Test of restaurant Fast food in Barisal city

<i>E. coli</i> . test of Fast food in Fast food restaurant									
Five Food sample test result for <i>E. coli</i> .					Five Food sample test result for <i>E. coli</i> .				
Characte	Ward	Ward	Ward	Mean	Characteris	Ward	Ward	Ward	Mean
ristics	1-10	11-20	21-30		tics	10	11-20	21-30	
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 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	20	20	0	0	6.67
No	80	100	80	86.67	60	80	100	100	93.33

Table 6: *Salmonella* Test of restaurant Fast food in Barisal city

<i>Salmonella</i> test of fast food in Fast food restaurant									
Five Food sample test result for <i>Salmonella</i> .					Five Food sample test result for <i>Salmonella</i>				
Characteri	Ward	Ward	Ward	Mean	Characteri	Ward	Ward	Ward	Mean
stics	1-10	11-20	21-30		stics	1-10	11-20	21-30	
Food item: Burger (%)					Food item: Vegetable roll (%)				
- (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: 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

Microbial Analysis of Fast Food for *E. coli*

Some samples showed the presence of *E. coli*. *E. coli*, were found 26.67% in Burger than in Vegetable roll 20.33%, 13.33% in chicken sandwich, 6.67% in Meat kebab, Hot dog, and Patties. Singara, Fried chicken and Samosa were found no *E. coli*.

Microbial Analysis of Fast Food for *Salmonella* spp.

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.

Discussion on Producer and Consumer status and micro biological status of Fast food restaurant

In the experiment, 100% male producers were found in fast food industry in Barisal city. Most of them (48.18%) are between 26-35 years. About 44.62% producer who had HSC and 3.03% were completed JSC examination. Women participation was limited except textile type business yet. As a developing country employment opportunity is limited so many educated person involve in fast food industry at Barisal city in Bangladesh. In microbial analysis it was observed that, Eighty seven percent of the samples were found to be satisfactory and 13% 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 consumption. According to Faruq and Akhter (2011) following points were noted which could be served as the source and cause of microbiological contamination, eg., 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. 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* Keeping sustenance for shown in glass boxes for quite a while at hoisted temperatures without refrigeration empower the microorganisms to multiply. Normal pathogens transmitted through uncovered gave treatment of sustenance are *Salmonella* spp. on the off chance that sustenance things are tainted with this living being and the nourishment is kept for quite a while in ideal development temperature. For *Salmonella* species, crude egg is one of the commonest wellsprings of sullyng. The pathogen may be introduced from raw materials to final products if the eggs used for the sandwiches are not cooked thoroughly.

Summary and Conclusion

The result explores that consumers have the most favorable attitude towards Singra then Burger and the least favorable attitude towards Patties, Sandwich, And Hot dog etc. 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. About 90% of the producer disposed their garbage on the roadside city garbage box. All (100%) of them cut their nail and washing hand regularly before food preparation and maintain personal hygiene. 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 *E. coli*, were found (26.67%) in Burger was maximum then in in Vegetable roll (20%), 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 had no 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.

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