

Knowledge assessment and practices related to food safety and hygiene of street food consumers

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ABSTRACT

Risk communication and consumer education to promote safer handling of food can be the best way of managing the risk of food borne illness at the consumer end of the food chain. The present study aimed to determine consumers' awareness, their preferences, knowledge and the practices for food safety while they were eating out in street food units. A sample size of 300 street food consumers from different food service providers were interviewed using a descriptive survey design of Ahmedabad, Gujarat. Majority of the consumers had knowledge about food borne diseases, adulteration, sanitation and microorganisms but while selecting a street food unit, consumers generally prefer taste and ignore other aspects of food safety and hygiene. Consumers ranked the restaurants very satisfactory in terms of quick service, hygiene, sanitation, food quality, taste, cost, convenience, etc. and usually prefer to dine out only on the weekends for a change or as a temporary arrangement. Consumers shouldn't eat at those SFU's which are unhygienic and poorly maintained, not compromising on food safety aspects, which will compel the SFU's to improve on their food quality safety and hygiene aspects.

KEY WORDS : Food safety, Food hygiene, Sanitary practices, Personal hygiene, Street food unit.

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Eating out has rapidly become a key part of the majority of consumers' lifestyles with both choice and opportunity growing steadily hand in hand. Consumers are relying increasingly on street foods because they are convenient, quick, and easy. It is now neither a rare nor privileged event with large numbers of consumers thinking nothing of eating out at least once a week. This report looks at the influences causing such a high frequency leisure activity and examines which factors are determining eating out habits. As consumer expenditure and disposable income have risen, eating out establishments has consistently kept their share of the wallet. The driving forces behind eating out have been examined in this report to identify why it enjoys the popularity that it does. Different consumer groups were examined in detail to establish not only which outlets they are using but also what their attitudes are towards the eating out experience. The financial freedom of increased affluence and the time restraints of a working population remove the monetary barriers and create the need for convenience which is driving much of the eating out activity. Effective food safety and nutrition policies improve public health without imposing unnecessary costs

on industry or the public.

Food borne illnesses impose a substantial economic and quality of life burden on society. A population based study on self-reported symptoms gastroenteritis in Ireland estimated that there were approximately 3.2 million episodes of acute gastroenteritis on the island each year (Scallan *et al.*, 2005). Although gastroenteritis is not always caused by food, foodborne gastroenteritis remains as substantial cause of morbidity and mortality. Evidence from studies worldwide suggests that food borne illnesses most commonly occur with a large proportion caused by cross contamination and improper food handling (Worsfold and Griffith, 1997)

Risk communication and consumer education to promote safer handling of food can be the best way of managing the risk of food borne illness at the consumer end of the food chain. Thus, an understanding of the overall status of food handling knowledge and practices is needed. Although traditional qualitative reviews can be used for combining information from several studies on specific food handling behaviours, a structured approach of meta-analysis can be more advantageous in a holistic assessment. Findings from 20 studies using meta-analysis

methods to estimate percentage of consumers engaging in risky behaviours, such as consumption of raw food, poor hygiene, and cross-contamination, separated by various demographic categories were carried out. There were considerable differences in behaviours across demographic categories, possibly were carried out because of socioeconomic and cultural differences. (Patil, 2005) Safe food and good nutrition are important to consumers. Maintaining the safety of consumer’s food supply is a shared responsibility among government, industry and consumers. Objectives of the study are as follows:

- To build a profile of the street food consumers about food safety practices in Ahemdabad city,
 - To identify the street food consumers’ frequency, preferences and reasons for eating out
 - To assess the knowledge of the consumers of different food service units regarding food safety and quality
 - To assess the overall performance of the street food unit of Ahemdabad city on aspects of food hygiene
 - To identify the knowledge and practices gaps among street food consumers in Ahemdabad city.
- Keeping this objectives in mind total 300 consumers from different food service providers were interviewed in Ahemdabad city of Gujarat

RESEARCH METHODS

A descriptive survey design was used to answer the questions concerning the assumption on food hygiene and sanitation, attitude and knowledge concerning food safety of consumers. The target population consisted of all street food units’ consumers of Ahemadabad city. Areas where there was maximum concentration of street food units

were identified, through a general survey of various wards of Ahemdabad city. Cluster sampling was done and areas from each zone were identified with maximum concentration of street food units. The identified areas were explored for all categories of street food units for preparation of sample population list (that is 10 times more than requirements). Random selection of the different categories of street food units viz., Vendors/ Kiosks, Road side Dhaba’s, Restaurants (small/medium), Railway station food outlets, Bus stand food outlets, Fast food joints was done for sample selection from sample population.

Sample plan:

Ahemdabad was divided into 5 different zones North, South, East, West and Central zone.

RESEARCH FINDINGS AND DISCUSSION

Food is essential for sustenance of life. The increasing number of consumers in the present day fast life demands safe and wholesome foods when away from home. Consumers vary tremendously in age, income, gender, education level and taste.

Characteristics of study subjects:

Almost half (48 per cent) of the consumers belonged to the age group of 18-35 years. More than three-fourth of the consumers were male where as only 68 out of 300 were females. Approximately three-fourth of the consumers belonged to Ahemdabad (ethnic). When the literacy levels of 300 consumers were evaluated, the results depicted that half of the consumers were educated between HSC to graduate. Almost half of the consumers were from service class, the reason could be limitation of time and easy availability of street food at economical rates, and while 22.3 per cent belonged to business class and only one tenth of the consumers were students. The daily income of the consumers was also assessed who visited street food units. It was found that daily income of one-tenth of the consumers who visited street food units was found to either less than Rs. 100 or more than Rs. 500, where as 21.4 per cent of the respondents daily income was between Rs. 300 – 500 while more than half of the consumers (that is, 53.7 per cent) daily income was between Rs. 100 to 300. The socio-economic and cultural changes have led to more and more people eating outside the home, where standards of hygiene and sanitation are uncontrolled. The results revealed that 32.7 per cent of the consumers consumed street food daily whereas 9.3 per cent of them rarely consumed street food. One-tenth of the consumers preferred to eat food

Sr. No.	Type of FSP	No. of locations	No. of consumers
1.	Street food vendor/Kiosk	5	60
Restaurants			
1.	Small	5	30
2.	Medium	5	30
3.	Fast food joints	5	30
4.	Road side dhabha	5	30
Food outlets			
1.	Bus stand	5	30
2.	Railway station	5	30
Food traders			
1.	Retailers	5	30
2.	Sweetmeat shop	5	30
Total			300

outside only on weekends, whereas 43 per cent of them consumed street foods twice or more than twice a week.

Street food unit where street food consumers eat food:

Street food is broadly categorized into street food vendors, restaurants (small and medium), fast food joints, road side Dhabas, railway station, bus stand outlets and sweet meat shops in the present study.

The results revealed that 30 per cent of the consumers ate food at street food vendors twice or more in a week where as only one-tenth of them, consumed daily at vendors. It was found that 44.7 per cent of the consumers went to the restaurants on weekends where as approximately one-third of the consumers never visited road side Dhaba or fast food joint or sweet meat shops. Very few of the total selected consumers daily visited the fast food joints, road side Dhabas, and railway and bus stand food outlets.

Period of outside eating and degree of satisfaction:

The outcome presents that 43 per cent of the consumers were consuming the food at street food units since 20 years, whereas 10 persons were consuming the street food from last 40 years. The degree of satisfaction of the consumers from the present place of unit depicts that, majority of the consumers (86.7 per cent) were satisfied with the present place of eating where as only one person found it poor.

Reason for eating at street food unit:

A little less than three-fourth of the respondents agreed that they eat at street food outlets for a change only, while majority of the consumers probably were single and had reasons like don't know to cook meal, no facility for cooking and no other comparable option (Table 1).

Like to buy/ eat at street foods	Agree		Disagree	
	F	P	F	P
1. Temporary arrangement	170	56.7	130	43.3
2. For change only	215	71.7	85	28.3
3. No time to cook meal	14	4.7	286	95.3
4. Do not know to cook the meal	2	0.7	298	99.3
5. There is no facility for cooking	2	0.7	298	99.3
6. No other comparable option	25	8.3	275	91.7
7. Convenience	114	38.0	186	62.0

Whether recently taken ill after consumption of street food and changes made:

It was found that one-third of the consumers have

taken ill due to consumption of street food. The results revealed that 34 per cents of consumers had brought changes in their eating pattern after falling ill. The other changes that were implemented by few of consumers reveal changing from open to packed food (2.7 per cent); oily to less oily (10 per cent) and the most important change that was practiced by 22 per cent of the respondents was avoid taking food in dirty surroundings (Table 2).

Sr. No.	Changes in food taking behavior	Yes		No	
		F	P	F	P
1.	Stopped going to street food joints	98	32.7	4	1.3
2.	More particular on clean water for drinking and washing	36	12.0	66	22.0
3.	Changed from cold to hot	30	10.0	72	24.0
4.	Changed open food to packed items	8	2.7	94	31.3
5.	Changed more spicy to less spicy	25	8.3	77	25.7
6.	Changed more oily to less or no oily food	30	10.0	72	24.0
7.	Avoid taking food in dirty surrounding	66	22.0	36	12.0

Change helped:

Majority of the respondents (that is 98 per cent) confessed that changes made in the eating pattern had helped, whereas 33 per cent of the consumers felt that they had stopped falling ill after consuming street food.

Preference for particular street food unit:

When dining outside the home, generally people have some or other considerations like the food should be hot, less oily, fresh tasty, economical etc. The results revealed that majority of the consumers generally preferred for delicious / fresh and hot quality foods (Table 3).

Opinion about the future of street food service:

When the consumers were asked to tell their opinion about the future of street food service, majority (90.3 per cent) of the consumers stated that demand of street food will increase while very few that is, 3 per cent were of the opinion that it will remain same.

Whether faced the problem of food adulteration:

Adulteration of food cheats the consumer and can pose serious risk to health in some cases, not only that, but it also affects the income of consumers which is falling

Table 3: Preference for particular street food unit

Sr. No.	Criteria	Generally		Sometimes		Rarely	
		F	P	F	P	F	P
1.	More sanitary and hygienic way of food preparation	243	81.0	19	6.3	38	12.7
2.	Better supervision	165	55.0	76	25.3	59	19.7
3.	Better food handling practices	135	45.0	101	33.7	64	6.4
4.	Tidy, well dressed street food handlers	113	37.7	99	33.0	88	29.3
5.	Descent people visit there	118	39.3	88	29.3	94	31.3
6.	Better surroundings	197	65.7	50	16.7	53	17.7
7.	Better quality food supplies/delicious food	280	93.3	8	2.7	12	4.0
8.	Less spice and less oil	103	34.3	71	23.7	126	42.0
9.	Better water	160	53.3	76	25.3	64	21.3
10.	Fresh and hot food	277	92.3	5	1.7	18	6.0
11.	Food cheaper and affordable	216	72.0	24	8.0	60	20.0
12.	Better cleanliness of the unit	206	68.7	41	13.7	53	17.7
13.	No consideration	14	4.7	2	.7	284	94.7

due to increase in process of essential commodities. Consumers should be aware of food adulteration and adulterants. More than half (58.3 per cent) of the consumers till date have not faced any problem of adulteration, because they said that they buy products of a reputed brand and from a well known shop, where as 41.7 per cent of them said that they have consumed some products which were adulterated.

Knowledge scale:

Disease:

When knowledge related to food safety and hygiene of the consumers of street food units was assessed, the results revealed that majority (96.7 per cent) of the people were aware that food poisoning occurs when contaminated food is consumed, where as 97 per cent of the consumers were aware of the fact that consumption of high fibre food is beneficial for digestion. Very few consumers knew that foods rich in fat cause food borne illnesses to a greater extent but it can occur due to other reasons also (Table 4).

Adulteration:

More than half (54.7 per cent) of the consumers agreed that clay / stones / gravels / hairs and excreta are considered adulterants, where as more than three-fourth (77.7 per cents) of them disagreed that adulteration is generally in processed form of food (Table 5).

Sanitation:

Consumers were aware about hygiene and sanitation to be practiced by food handlers and units.

Table 4: Knowledge related to food safety and hygiene

Sr. No.	Diseases	True		False	
		F	P	F	P
1.	Viral diseases spread though contaminated milk	247	82.3	53	17.7
2.	Food poisoning occurs when food contaminated with microbes or their toxins are eaten	290	96.7	10	3.3
3.	Foods rich in fat cause food borne illnesses to a greater extent	286	95.3	14	4.7
4.	Contaminated water is the carrier for most of the viral diseases	288	96.0	12	4.0
5.	High fibre foods e.g. high bran atta are beneficial for digestion	291	97.0	9	3.0

Table 5: Source of adulteration

Sr. No.	Adulteration	True		False	
		F	P	F	P
1.	Clay/stone /gravels/hairs/rodent hair and excreta are considered adulterants	164	54.7	136	45.3
2.	Adulterants are used generally in processed form	67	22.3	233	77.7
3.	Adding color in the food is adulteration	117	39.0	183	61.0

The results (Table 6) disclosed that majority (95-98 per cents) of the consumers were aware that dirty towels should not be used, temperature of food affects growth of micro organisms, hand should be washed with detergent / soap to prevent bacterial disease and use of disinfectant for cleaning to kill microorganisms and reduce its growth

Table 6: Practice of hygiene and sanitation by consumers

Sr. No.	Sanitation	True		False	
		F	P	F	P
1.	One should not use towel if it is dirty.	294	98.0	6	2.0
2.	Temperature of the food affects growth of micro organisms in food	285	95.0	15	5.0
3.	Washing of hands with detergent soap is essential before taking needs to prevent from bacterial diseases.	295	98.3	5	1.7
4.	Cleaning Wash/ Cleaning area with disinfectants kills micro organisms and reduces its growth	296	98.7	4	1.3
5.	Contamination of foods may occur through water	179	59.7	121	40.3

Micro organisms:

It was found that majority (87.3 per cent to 91.3 per cent) of consumers had high awareness about food safety and hygiene practices like pressure cooking essential for killing bacteria, chilling of food hinders growth of micro organisms and food spoilage occurs through microbial growth (Table 7).

Table 7: Awareness about microorganisms

Sr. No.	Micro organisms	True		False	
		F	P	F	P
1.	Pressure cooking is essential to kill bacteria	262	87.3	38	12.7
2.	Chilling of food hinders growth of micro organism	266	88.7	34	11.3
3.	Food spoilage occurs through microbial growth	274	91.3	26	8.7

Practices:

The results of Table 8 depicted that more than half (51.7 per cents) of the consumers were unaware of the fact that while purchasing jam, jellies, pickles, soft drinks, one should look for FPO mark instead of ISI mark, where

Table 8: Awareness about quality of preserved food

Sr. No.	Practices	True		False	
		F	P	F	P
1.	While buying jam, jellies, pickles, soft drinks one should look for ISI mark	145	48.3	155	51.7
2.	While buying ghee butter, honey etc. Agmark should be looked for	235	78.3	65	21.7

as 78 per cent were aware that while buying ghee, butter, honey etc. Majority of the consumers believed that consumption of peeled and cut fruits on fruit shop and deep fried foods should be avoided to protect from digestion troubles, respectively (Table 8).

Practices adopted for delivery/ eating from street food units:

Practices adopted by consumers for eating or delivery from street food units were like eating at street food unit with friends, family, alone or ask for home delivery etc. Majority of the people always ate at street food unit with friends or family members or alone, while 46.7 per cent of the consumers sometimes asked for home delivery of food. Majority of them rarely send someone to pick up the food.

Overall performance of the SFU:

It was tried to assess the overall performance of the SFU by ranking them on basis of quick service, hygiene, sanitation, food quality, taste, cost, convenience, etc by the food outlet (Table 9). The results in general revealed that two-third units of railway station/ bus food outlet, food trader/retailer were ranked poor, because the consumers were not satisfied with the services, taste, sanitation, hygiene, cost etc. of the units. Less than one-third of the respondents were satisfied with the services provided by the vendors and fast food joint, while 22.3 per cent of the respondents rank order vendors in poor category. More than two-fifth of the consumers have given very good rank to restaurants (small and medium). One among 300 consumers gave excellent rank to fast food joints and sweet meat shop where as 34 per cent and 24.3 per cent of them ranked fast food joint and sweet meat shop satisfactory, respectively.

Identifying gaps between knowledge and practices:

More than 40 per cent of the consumers used to eat food at street food vendors twice or more in a week. According to Faye *et al.* (1998) on the parasitic risk for street-food consumers, the infection rate was 60 per cent

Table 9: Overall performance of the SFU

Sr. No.	Category	Ranking									
		Excellent		Very good		Satisfactory		Fair		Poor	
		F	P	F	P	F	P	F	P	F	P
1.	Street food vendor	-	-	65	21.7	93	31.0	75	25.0	67	22.3
2.	Restaurant (small/medium)	12	4.0	128	42.7	126	42.0	19	6.3	15	5.0
3.	Fast food joint	1	.3	49	16.3	102	34.0	61	20.3	87	29.0
4.	Roadside side Dhaba	3	1.0	20	6.7	87	29.0	84	28.0	106	35.3
5.	Railway/bus food outlet	1	.3	16	5.3	30	10.0	69	23.0	184	61.3
6.	Food retailer/trader	-	-	4	1.3	23	7.7	89	29.7	184	61.3
7.	Sweetmeat shop	1	.3	25	8.3	73	24.3	97	32.3	104	34.7

among sellers and 45.5 per cent among consumers. Protozoans were predominant in both groups. Among the consumers, those exposed were significantly more infected. However, appropriate measures must be implemented in order to minimize risks for street-food consumers. Majority of the street food consumers have high awareness about food borne diseases, adulteration, sanitation and microorganisms but while selecting a street food unit, consumers generally prefer taste and ignore other aspects of food safety and hygiene.

Key findings:

- Generally people prefer to eat where :
- Delicious food is served.
- Hot food is served.
- Food safety and hygiene in food preparation is neglect to greater extent.
- Majority of consumers believe that demand of street foods in future will increase.
- Consumers ranked the restaurants very satisfactory in terms of quick service, hygiene, sanitation, food quality, taste, cost, convenience, etc. and usually prefer to dine out only on the weekends for a change or as a temporary arrangement.
- Majority of the consumers had knowledge that foods rich in fat cause food borne illnesses to a greater extent.

Suggestions:

- Consumers pertained that they opt for hygiene food

but in practice it was found contradicting to what they said.

- Consumers shouldn't eat at those SFU's which are unhygienic and poorly maintained, not compromising on food safety aspects, which will compel the SFU's to improve on their food quality safety and hygiene aspects.

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