



Perception and Concerns of Consumers on Food Safety and Factors Influencing Purchase of Vended Foods

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Abstract

The purpose of the study was to assess the food safety perception, opinions and concerns of consumers on street vended foods and identify the factors that influence the purchase of vended foods. The study used a descriptive survey design, with the study's target population being consumers of street food in the Takoradi metropolis. The total sample size for the study was one hundred and eighty-eight (188) consumers of street foods of varying ages and educational backgrounds. Structured questionnaires were used to collect data for this study. Majority (60%) of respondents perceived street foods were safe, although there were some worries, according to the survey. The chi-square test (0.021) found an association between the opinions on the safety of street foods and the gender of respondents. Food safety factors such as improper food preparation (2.52), sanitation (2.51), microbial contamination (2.51), and pesticide residue (2.51) were considered as strong concern factors of food safety by consumers. Nutritional imbalance (2.44), cholesterol content (2.36), calorie content (2.36), vitamin content (2.30), and food additive content (2.23) were food safety factors of moderate concern to the consumers. The larger (62%) number of the population indicated that the price of the food as a factor for purchasing street vended foods is utterly important to them, however environmental cleanliness (55%) where food is sold, cleanliness of the vendor (44%), taste of the food (45%), aroma of the food (50%) were very important factors they consider before purchasing any street food. It is suggested that authorities in charge of regulating the activities of street food vendors make it a point to educate them, as well as the general public, about the importance of following good food safety measures.

Subject Areas

Food Science & Technology

Keywords

Consumer Perception, Concerns, Food Safety, Purchasing Factor, Street Foods

1. Introduction

Vending of food has now become a common phenomenon within urban areas, and this has been a source of employment in most developing countries. In society and the economy at large, the street food industry contributes significantly to the lives of the indigent. The sector employs more than 60,000 people in Accra [1] and also generates an annual turnover of more than US\$ 100 million with annual revenue of more than US\$24 million [1]. In Ghana and Africa as a whole, for persons with no or little education, vending food is seen as viable economic operation [2] [3]. Even though the sector contributes enormously to the development of urban and rural folks in terms of employment and food supply, a concern has been raised by health professionals and food control officers regarding the extent to which street food vendors apply food safety measures during the preparation and handling of food [4]. [5] adds that the lack of proper application of food safety measures could result in food-related or food-borne diseases. [6] is of the view that food consumption is not merely a matter of choice, but ultimately a matter of life and death, therefore food safety is a corporate social responsibility. It is the number one non-negotiable concern of the food industry and is also a global priority for governments as foodborne diseases emerge in countries across the globe with related deaths and economic losses [7]. If all stakeholders, including governments, legislators, food producers, food suppliers, caterers, farmers, and all consumers play their roles well in keeping food safe, issues of food safety can be resolved. In a study conducted in Ghana's national capital, Accra by [8], many consumers indicated that bad hygiene was not associated with illness. This demonstrates the low level of customer knowledge regarding potential diseases one could get when hygiene is not being practiced. Although many consumers attach importance to hygiene when selecting a street food seller, consumers are still unaware of the health risks associated with street foods; this is due to the fact that most consumers classify food as safe by using their senses, notably their eyes and noses. Hence, a food that smells or seems terrible is recognized as being unfit for consumption and should not be consumed [9]. [10] buttressed that consumers cannot approximately state the risk of incurring a food-borne disease while purchasing or eating a food item because it is not possible to detect the degree of microbial contamination or the number of chemical residues Consumers, therefore, need to make educated decisions about

their food and how it is treated and prepared [11].

Food can be mishandled in several ways during food preparation, handling, and storage and many studies indicate that consumers have inadequate knowledge of the procedures required to prevent foodborne diseases at home [12] [13] [14] [15]. Food-borne disease prevention includes educating food consumers about healthy food handling practices [16]. Before education, though, it is important to determine consumer-relevant food safety issues. The level of education has been shown to influence the level of information or understanding of any casual user, in combination with age, sex, and income level [4] [14] [17] [18] [19] [20] [21]. Customers' purchasing decisions influence the food safety system to the extent of the rationalism and selectivity they stand for. Additionally, they want legal, safe, affordable, and nutritious food from all sources, ensuring that food production facilities and retail establishments adhere to all applicable food laws, international standards, and norms. When people are informed, they will be encouraged to form non-governmental organizations to promote and assure the effective operation of food safety programmes, while also urging the government to enact laws protecting consumer rights [22].

In a study, [23] [24] found that age, sex, employment, and educational background influences consumer awareness regarding food safety and behaviour. Other research conducted indicates that there is more awareness and understanding in women than in men [25] [26] and in adults than in youth [19] with respect to food safety. Another study showed that there is inadequate awareness among consumers about foodborne diseases, hand-washing habits, food purchases, the separation of raw and cooked foods, the thawing and cooling of frozen foods, and the use of raw eggs and, thus, the obvious need for consumers to pursue food safety education [27]. Research conducted to evaluate awareness, attitudes, and behaviours on foodborne diseases and Italian Mothers' food processing practices revealed that thirty-six percent of the mothers surveyed knew or have learnt about pathogenic microorganisms. It was also found that education level is a predictor of this awareness, and to a high degree, older and more educated women among the respondents showed a positive attitude and approach to foodborne disease [17] [28]. In another study investigating the knowledge of food safety and consumer perceptions, it was clearly shown that most consumers lacked information on typhoid, gastrointestinal inflammation, and amebiasis, despite knowing about foodborne diseases such as cholera, food poisoning, and jaundice [18].

Foods sold by street vendors are extremely important for health, as food safety has become a global public health concern [29] [30]. The hygienic aspects of food sold on the street are a big concern for customers and food safety officers alike [31] [32]. In Ghana, it has been reported that contamination levels in food sold are higher than in food cooked at home. Notwithstanding efforts to reduce the incidence of food-related ailments by the Ministry of Health, microbiological food contamination is alarming. The total number of foodborne diseases regis-

tered in Ghanaian hospitals is estimated at 420,000 annually, with an approximate annual death rate of 65,000 and a total cost to the Ghanaian economy of US\$ 69 million [33]. These findings question food safety practices (mode of preparation, handling, storage, and presentation) and knowledge levels of food vendors in minimizing food-related diseases resulting from food contamination. The objective was to assess food safety perception, opinions and concerns of consumers, food safety practices of street food vendors and the factors that influence the purchasing of vended foods by consumers in the Takoradi Metropolis.

2. Methodology

2.1. Description of Study Area

The study was conducted in the Takoradi Metropolis which is bounded to the North by Mpohor-Wassa East, to the South by the Gulf of Guinea, West by Ahanta West District, and to the East by Shama District. It has a total land area of 49.78 km², with Sekondi as the administrative headquarters. The metropolis is located on the west coast, about 280 km west of Accra and 130 km east of the Ghana-La Cote D'voire border. It is thus strategically located considering its closeness to the sea and the airports and accessibility to major cities by rail and road. The metropolis is of varied topography. The area is generally undulating and drained by rivers and tributaries. The average annual temperature is 20°C. The vegetation is woodland in the north and intermingled with mangroves along the coastal areas. The current population is 559,548 (Population and Housing Census, 2010) with a growth rate of 3.2%. With a land area of 49.78 km², the current population density of the Metropolis stands at 8140 persons/km. About 69% of the population is urban with 31% rural. Most of the socio-economic infrastructure is densely concentrated in the core urban centres of the metropolis such as Takoradi and Sekondi with sparsely distributed facilities at the peri-urban. The study stratified the population into subgroups namely New-Site, Effiakuma, Market circle, and Sekondi areas. This was done to ensure the representativeness of the sample and also make it easier and simplify the selection of respondents.

2.2. Study Design and Sampling

A descriptive survey design was used for the study. The target population for the study was consumers of street foods within the Takoradi metropolis. The total sample size for the study was two hundred (200) consumers of street foods of varying ages and educational backgrounds. The study employed proportionate sampling and purposive sampling techniques to ensure that, each consumer within the Takoradi and Sekondi metropolis had a fair chance of being selected thereby avoiding biases and also obtaining a representative sample. Fifty consumers were selected from each group by the use of convenient sampling technique.

2.3. Questionnaire Design

A structured questionnaire was prepared based on similar studies [29] [30]. The questionnaire was divided into three sections: 1) Socio-demographic characteristics (sex, age, education, employment, and marital status), frequency of buying street food, the amount spent on street food, and factors considered when buying street food; 2) Consumers' perception of food safety and its effect; 3) Purchasing options of consumers.

2.4. Data Collection

The questionnaires were administered with the help of trained research assistants. This was to ensure practicability. The questionnaires were administered during business hours which made it easier to locate the food vendors and consumers. Where necessary, questions were explained to the respondents using the local language (Fante and Twi). A total of 200 respondents were sampled for the study. However, only 188 questionnaires from the consumers were returned which represents a 94.0% response rate.

2.5. Data Analysis

The data was analyzed using SPSS version 16.0 (SPSS Incorporated, Chicago, Illinois, USA) statistical package. A summary of the respondent's socio-demographic data, knowledge, and perception of consumers on food safety, food safety concerns of consumers, and factors consumers consider before purchasing street-vended foods was presented using descriptive statistics. Opinions of consumers on the safety of street foods, and knowledge (level of education) of consumers on food safety, were analyzed using Pearson's chi-square test and Fisher's test of significance at an alpha level of 0.05 ($p \leq 0.05$).

3. Results and Discussion

3.1. Socio-Demographic Characteristics

Table 1 represents the demographic characteristics of respondents. Out of 188 respondents, males were 117 representing 62.2% of the total population sampled; indicating males were overtly more than females. It was also observed that respondents between the ages of 18 years to 24 years recorded the highest percentage of respondents (43%), followed closely by the 25 - 34 years age brackets (26%). These two age groups form the youngest among all the other categories. It was moreover shown that the majority of the singles were found to be in this group who eat most of their foods away from the home. Only a few of the respondents, about 6% were found to have aged 55 years and above. It was observed that most (70%) of the respondents had tertiary education. Again, 18 percent of the respondents have also had a secondary or "O" level form of education. The illiterates were more than those with a primary level of education.

Again, it could be observed from **Table 1** that, those who were single made up about 63% of the entire respondents. While the married ones were 28%, the se-

parated or divorced were just 4% of the total respondents. Regarding employment status, the majority (40%) of the consumers were students. Whereas about one-quarter of the consumers (30%) were public sector workers, just 4% of them were part-time workers. Moreover, 4% of the respondents were retired workers and about 7% of the consumers were homemakers. Again, 13.8% of the consumers mentioned other forms or kinds of employment.

Table 1. Demographic characteristics of respondents.

Characteristics	N (%)
Gender	
Male	117 (62.20)
Female	71 (37.80)
Age	
18 - 24	80 (42.60)
25 - 34	48 (25.52)
35 - 44	29 (15.40)
45 - 54	19 (10.10)
55 and above	12 (6.10)
Educational Level	
Illiterate	8 (4.30)
Primary	3 (1.60)
JHS	13 (6.90)
SHS/"O" Level	33 (17.60)
Tertiary	131 (69.70)
Marital Status	
Single	118 (62.80)
Married	53 (28.20)
Separated/Divorced	8 (4.30)
Widowed	9 (4.80)
Employment Status	
Full time	57 (30.30)
Part-time	9 (4.80)
Student	75 (39.90)
Retired	8 (4.30)
Homemaker	13 (6.90)
Other	26 (13.80)

N = 188, JHS—Junior High School, SHS—Senior High School.

3.2. Perception of Consumers on Food Safety

Table 2 gives the representation of consumers' perception of how safe street foods are. The majority of the respondents, (about 61%) indicated that street foods are safe, but that there are some concerns though. These concerns were something peculiar to them. However, about 15% of the respondents raised the issue that street food is not safe and as such have much concern for them. On the other hand, 10% mentioned that street foods are very safe and that they do not have any concerns whatsoever. It may be very deceptive to think street foods are safe from looks or appearance since the safety of a particular type of food goes beyond just the looks. However, by consumers' standards, if they see foods to be safe, no one should begrudge them. [14] stated that the safety of everything eaten is very paramount. He also added that in most developing countries where it is challenging to test scientifically most of the foods people consume, whichever way the consumer measures the safety of food is accepted. This is premised on the fact that consumers' perception of safety emanates from various sources. The income the person earns the orientation of such consumer and the kind of friends or community he/she finds himself. [11] argued that the safety of foods is measured by some standards and a deviation from them constitutes gross negligence and is very serious to the health of people.

On **Table 3**, it shows a cross-tabulation of the relationship between consumers' perception of food safety and gender. On the issue of street food being very safe 75% of the males affirmed this claim and went ahead to state that they have no

Table 2. Perception of consumers on food safety.

Responses	N (%)
Very safe, not a concern	20 (10.6)
Safe, but some concern	114 (60.6)
Somewhat safe, but moderate concern	26 (13.8)
Not safe, much concern	28 (14.9)

N = 188.

Table 3. Relationship between consumers' perception of food safety and gender.

Responses	Frequency (f)		Percentage (%)	
	Male	Female	Male	Female
Very safe, not a concern	15	5	75	25
Safe, but some concern	71	43	62.3	37.7
Somewhat safe, but moderate concern	13	13	50	50
Not safe, much concern	10	18	35.7	64.3
Total	109	79	100	100

$\chi^2 = 16.14$; p-value = 0.021.

concerns. Just one-quarter of the females (25%) agreed with the males that street foods are safe and they do not have any concerns. About 62.3% of the males said that street foods are safe but they have some concerns. Quite the same percentage of females as the males (50%) said that street foods are somewhat safe but have moderate concerns. A resounding majority (62.2%) of the females stated that street foods are not safe because there are several concerns about them and this buttresses the observations made by [11] that food safety standards are standards and there should be no compromise or neglect.

The statistical significance of the chi-square test (0.021) as shown in **Table 3** implies that indeed at an alpha level 0.05, there was an association or a relationship between the opinions on the safety of street foods and the gender of respondents. The differences in the opinions could be explained by the fact that most females enjoy and prefer cooking themselves to purchasing street vended foods. Males unlike females because of their natural makeup, time constraint, and most often than not, not knowing how to cook resort to street foods. This blindfolds them to the negative implications of street foods on their health [31] [32].

3.3. Consumers' Food Safety Concerns

The factors raised in **Table 4** were ranked from 1 (low concern) to 3 (high concern). Among the factors stated consumers considered improper food preparation (2.52), sanitation (2.51), microbial contamination (2.51), and pesticide residue (2.51) were all considered as strong concern factors of food safety by

Table 4. Concerns of food safety by consumers.

Concerns	Ratings			Mean
	Low concern	Moderate concern	Strong concern	
	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	
Sanitation	29 (15.4)	34 (18.1)	125 (66.5)	2.51
Microbial contamination	32 (17.0)	28 (14.9)	128 (68.1)	2.51
Pesticide residue	30 (16.0)	32 (17.0)	126 (67.0)	2.51
Cholesterol content	38 (20.2)	126 (67.0)	24 (12.8)	2.36
Food additive content	46 (24.5)	89 (47.3)	53 (28.2)	2.23
Use of common cutlery set	79 (42.0)	62 (33.0)	47 (25.0)	2.09
Improper food preparation	30 (16.0)	30 (16.0)	128 (68.1)	2.52
Vitamin content	31 (16.5)	89 (47.2)	68 (36.2)	2.30
Nutritional imbalances	26 (13.8)	109 (58.0)	53 (28.2)	2.44
Calorie content	35 (18.5)	103 (54.8)	50 (26.6)	2.36

Scale: 1 - 1.49 = low concern, 1.5 - 2.49 = moderate concern, 2.5 - 3 = strong concern.

consumers. Consumers considered moderate concerns were nutritional imbalance (2.44), cholesterol content (2.36), calorie content (2.36), vitamin content (2.30), and food additive content (2.23). The factor consumers considered least significant was the use of common cutlery sets (2.09). This may be due to perhaps the fact that they are washed with soap after use. These results have some similarities with the study of [32] which posit that sicknesses normally from foods were coming from chemical contaminations and improper use of spices in most street foods.

3.4. Relationship between the Purchase of Street Vended Foods and Educational Level

Table 5 presents a cross-tabulation between the level of education and how often street food is bought. It is assumed that as one climbs up the ladder of education they are less likely to spend much on street foods or eat several times at the roadside. An association test (chi-square test) performed, proved that there is a correlation or relationship between education and purchase of street foods. This is perhaps due to the enlightenment further education has bestowed on them. It was realised that half of all the illiterate eat outside at least once a week. Few of the consumers with primary education levels often eat outside. This means that a number of them rarely eat outside the home. Looking at **Table 5** it was quite surprising to see that consumers with an SHS level of education and those with a tertiary level of education together constitute the majority of consumers of street foods. Together they make up over two-thirds (87%) of the consumer respondents who often buy street foods.

According to [24] education is very paramount regarding the safety of street foods. From the conclusions of [18] [20] as one increases the educational level certain safety concerns in every sphere of life become non-oblivious. Again, according to [23] age, gender, income, and educational level all affect customer

Table 5. Relationship between educational level and the purchase of street vended food.

Level of Education	How often is street food bought?							
	Once per Week		Three Times per Week		Five Days of the Week		All the Days of the Week	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Illiterate	4	50.0	1	12.5	1	12.5	2	25.0
Primary	1	33.0	0	0.0	2	67.7	0	0.0
JHS	4	30.8	4	30.8	0	0.0	5	38.5
SHS/O' LEVEL	13	39.4	8	24.2	5	15.2	7	21.2
Tertiary	42	32.1	57	43.5	24	18.3	8	6.1
Total	64	100	70	100	32	100	22	100

$\chi^2 = 28.94$; p -value = 0.004.

knowledge of food safety and behaviour. The significance of the chi-square statistic (0.004) proves that there is a great association between education and street food buying. The study went further to test for the direction of the relationship by the use of Pearson's correlation coefficient test. The test indicated a negative relationship between the two variables. This means that as one increases in educational level, the tendency of patronising more street foods drops as was maintained by [18]. Unfortunately, the results in **Table 5** proved otherwise. It was observed that rather the majority of street food consumers were those with SHS and tertiary education backgrounds. This defeats the conclusions of [18] [20] [23] and maybe because perhaps they perceived street food vendors to be adhering to food safety practices, and also the study area had more respondents in that bracket of educational level.

3.5. Factors Consumers Consider before Purchasing Street-Vended Foods

On **Table 6**, it was seen that about 62% said the price of the food (1.63) as a factor is utterly important to them. Again, the respondents made it clear that in fact, the convenience (1.56) of the sale point of the food is was also of importance; with more than half (65%) of the respondents indicating so. Very characteristic of street food consumers, environmental cleanliness (2.16) where food is sold, cleanliness of the vendor (2.04), taste of the food (2.14), and aroma of the food (2.33) were very important factors they consider before purchasing any street food. Moreover, from the **Table 6**, respondents sounded that though high food additive content is a characteristic of most street foods, it was not very important enough to affect their attitudes when buying food at any point on the street. Also, 44% of consumers hinted that they rather consider the appearance of the food as a factor in deciding to purchase street foods. The demeanour of a

Table 6. Factors consumers consider before purchasing street-vended foods.

Factors	Rating			Mean
	Not important	Important	Very important	
Price of food	26 (13.8)	116 (61.7)	46 (24.5)	1.63
Convenience as a factor	23 (12.2)	123 (65.4)	42 (22.3)	1.56
Cleanliness of the surrounding	74 (39.4)	10 (5.3)	104 (55.3)	2.16
Cleanliness of the vendor	75 (39.9)	30 (16.0)	83 (44.1)	2.04
Taste of the food	58 (30.9)	45 (23.9)	85 (45.2)	2.14
Appearance of vendor	64 (34.0)	41 (21.8)	83 (44.1)	2.10
Aroma of the food	32 (17.0)	61 (32.4)	95 (50.5)	2.33
Food additive content	50 (26.6)	106 (56.4)	32 (17.0)	1.60

Scale: 1 - 1.49 = Not important, 1.5 - 2.49 = Important, 2.5 - 3 = Very important.

food vendor is really important as it can tell a buyer to either buy or not. The factors mentioned in **Table 6** goes to underscore the conclusions of [29] [32] [33] that lack of knowledge of food safety tips is the trigger of transmission of food-borne pathogens.

4. Conclusion

The survey gave evidence that most of the consumers believed that street foods were generally safe but had some bits of concerns. Some concerns raised by consumers as important were sanitation, microbial contamination, improper food preparation, pesticide residue content, cholesterol content in foods, and nutritional imbalances. Female consumers were the most concerned about the food safety of street foods. The majority of the consumers of street-vended food were men and literate. Cleanliness of the surrounding of the vended street food was found to be a very important factor for consumers when purchasing food.

Conflicts of Interest

The authors declare they have no known conflicting interests that could affect the findings in this study.

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