



# Knowledge about Food Safety among Buyers and Sellers in a Municipality Market

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## Abstract

**Background:** Proper storage, sanitary equipment and work areas, heating and cooling to the correct and necessary temperatures, and avoiding contact with other raw foods may significantly reduce the risk of contamination. Important approaches for preventing physical and biological contamination during storage include the use of airtight, water-resistant containers. The use of clean, hygienic surfaces and equipment that are free of dirt, chemicals, standing liquids, and other kinds of food (such as combining vegetables and meats or beef and poultry) is one strategy to limit the danger of all sorts of infections. This research is important, particularly post-pandemic. This research assesses purchasers' and sellers' food safety knowledge at a municipal market. Since the previous two years have been pandemics, it's crucial to know how many buyers and sellers follow food safety and hygiene measures.

**Methodology:** This was a quantitative cross-sectional study, which was conducted at Mohammadpur municipal market. For this study, 202 respondents (Buyer 101 and 101sellers) were selected for interview.

**Results:** In total 202 participants were taken participated in this study. The average age of those participants was 38.16 years, and maximum age was 78 years, and the minimum age was 18 years. Table 1 shows the age distribution among the respondents. The gender distribution is based on buyers and sellers. In both the cases of buyers and sellers, the highest percentages were male: 72% and 87% (chronologically). Besides, female participants were low in both buyers and sellers. Level of education, and training on food safety of buyers have a significant ( $p < 0.001$ ) relationship with the knowledge of food safety.

**Conclusion:** To prevent and get a handle on the potential risks and spread of food borne illnesses, there is a need for increased vigilance and control of the practices of food vendors. This can be done through the enforcement of regulations, proper hygienic practices, and food safety control measures by local authorities who are empowered to perform their functions without constraints.

## INTRODUCTION

Bangladesh, which gained independence in 1971, is the youngest nation in South Asia and shares a history with its neighbors. About 60 percent of Bangladesh's population lives in rural regions, making it the most densely inhabited nation in the world. Agriculture, which cultivates 70 per cent of the land area, employs around 40 per cent of the people and accounts for approximately 13.3 per cent of the gross domestic output (GDP) [1]. The majority of the agricultural economy may be broken down into the subsectors of crops (55%), fisheries (22%), livestock (14%), and forests (9%) [2]. Rice, jute, wheat, tea, legumes, aquaculture, oilseeds, fruits and vegetables are only a few of the many crops that are grown in Bangladesh. Other crops including Agriculture has a significant role in meeting the demands of the nation in terms of food, nutrition, and livelihood, and as a result, it makes a contribution to the continued growth and development of the economy. Even though agriculture is a significant contribution to the national economy, it has not

advanced beyond a subsistence level due to variable crop yields and a lack of built infrastructure [3]. These issues need to be addressed to improve the nation's food security and safety in light of the additional demand that is being placed on arable land by the expansion of urban areas. A strong economic growth rate of nearly 8%, with the service sector providing roughly 50% of the GDP, together with urban population expansion and expenditure, is leading to an increase in the demand for processed food that is of high quality in the nation [4].

Despite seeing significant expansion over the course of the previous decade, the agro-food processing sector's contribution to the nation's gross domestic product (GDP) has remained below 2%. The manufacturing sector is dominated by industries such as ready-made clothing production. Processing agricultural and food products account for around 1.5 per cent of overall exports and had a value of more than 420 million USD in 2018. Even though Bangladesh's proportion of agricultural and food exports is

relatively low, the country sells food goods to more than 140 nations.

Food safety, often known as food hygiene, is a scientific approach and discipline that describes the handling, preparation, and storage of food in a manner that reduces the risk of food-borne disease. An outbreak of food-borne disease is defined as the development of two or more instances of an illness that is similar to one another and that is caused by the consumption of a common food [5]. This comprises a variety of precautions that must be taken to prevent possible health risks. In this sense, food safety and food defence often overlap to protect customers from damage. Within this train of thinking, the rails are safety between industry and the market, followed by safety between the market and the consumer. Food safety considerations include the origins of food, including practices relating to food labelling, food hygiene, food additives and pesticide residues, as well as policies on biotechnology and food and guidelines for the management of governmental import and export inspection and certification systems for foods, when evaluating industry to market practices. Generally, when addressing market-to-consumer procedures, it is assumed that food should be safe on the market, and the main focus is safe food transportation and preparation for the customer.

## MATERIALS AND METHODS

### Subheading

#### General Objectives

To assess the level of knowledge about food safety among buyers and sellers in a municipality market.

#### Specific Objective

- I. To assess the level of knowledge of buyers
- II. To assess the level of knowledge of sellers.
- III. To know awareness about food safety.
- IV. To determine the quality of food.
- V. To observe their practice regarding food safety.
- VI. To know the socio-demographic condition of both buyers and sellers.

#### Study Design

This was a quantitative cross-sectional study.

#### Study Location

This study was undertaken at Mohammadpur municipality market in Dhaka.

#### Study Period

This study was conducted between, November 2020 – January 2021.

#### Study Population

Food buyers and sellers were the primary respondents for this study.

### Study Sample

Simple random sampling was used for this study.

### Sample Calculation

To estimate proportion:

$$N = (Z^2pq)/d^2$$

Here, n= Number of samples

Z= Level of significance / confidence level (at 5% level, z=1.96)

p= Expected proportion of event or prevalence of the event. (p is assumed 50%)

$$\begin{aligned}q &= 1-p \\ &= 1-0.50 \\ &= 0.50\end{aligned}$$

d= allowable error/precision in the estimates of 'p' (proportion)

By using the above formula, the sample size is 384

However, due to time and resource constrain total sample size taken was 202 for this research.

### Eligibility Criteria

Inclusion criteria:

- Must be a regular buyer and seller of Mohammadpur municipal market.

Exclusion criteria:

- People below 18 years of age were out of this study.
- Any respondents who are not psychologically fit to understand the questions
- Any respondents who was not willing to participate in

### Development of Research Instrument

This study was conducted using a pre-tested questionnaire. The researcher will administer the whole questionnaire. Pre-tested data was analyzed to see the accuracy of the collected data.

### Data Collection

One month was kept for data collection. Researchers solely administered the whole questionnaire.

### Data Analysis

As the primary software, SPSS 23 and Microsoft Excel were used. STATA 24 was used for some statistical analysis. JASP was kept on standby for any kind of complication.

### Data Presentation and Interpretation

The data was presented by a compatible mixture of three basic methods. They are the textual method, the tabular method, and the graphical method. The demographic table and chart have been introduced in the data presented. A proper bar

chart, pie chart, or scatter plot will present the comparative analysis. All tables of visual graphics representation will depend on statistical applications.

### Data Quality Management

Data quality management was performed based on integrity, completeness, validity, uniqueness, accuracy, and consistency. Data quality management was done by randomly collecting filled-up questionnaires and checking them for errors like missing data, duplication, inconsistencies, repetition of information and data, incomplete data, etc.

### Ethical Issues

- The study was performed with the consent of the respondent. There was no harm to humans or animals in this study.
- It was ensured that their identity was kept confidential, and the data was only used for study purposes.

- ERB clearance was taken from the University of South Asia.

### Limitation

- Because of the pandemic situation, respondents were available to take interviews.

Self-bias may take place when answering the questions.

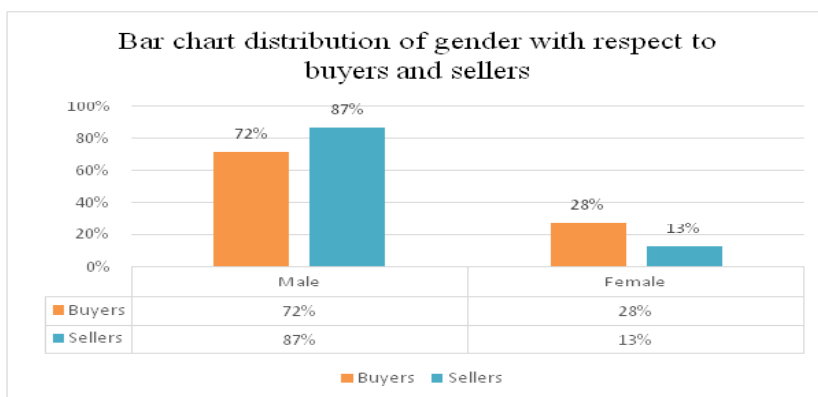
### RESULTS

This research intends to measure the level of knowledge regarding food safety among buyers and sellers in a municipal market. In this research, 202 respondents participated and gathered the information based on the questionnaire. The researcher gathered the data and numerically coded and input it, utilizing SPSS 23.0 version. This chapter has a graphical and thematic presentation of the results and a discussion based on what the research question asked.

**Table 1.** Distribution of the frequency of age of the respondents (N=202)

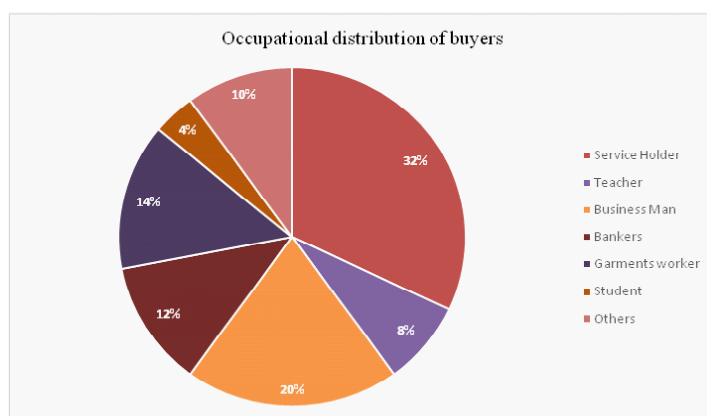
Variables	N	Minimum (in Years)	Maximum (in Years)	Mean (in Years)	Std. Deviation
Age	202	18.0	78.0	38.16	2.0627
Valid N	202				

Table no- 1 shows that in total 202 participants were taken participated in this study. The average age of those participants was 38.16 years, and maximum age was 78 years, and the minimum age was 18 years. Table 1 shows the age distribution among the respondents.



**Figure 1.** Bar chart of gender distribution concerning buyers and sellers

Figure 1 shows the gender distribution based on buyers and sellers. In both the cases of buyers and sellers, the highest percentages were male: 72% and 87% (chronologically). Besides, female participants were low in both buyers and sellers.



**Figure 2.** Pie chart of occupational distribution

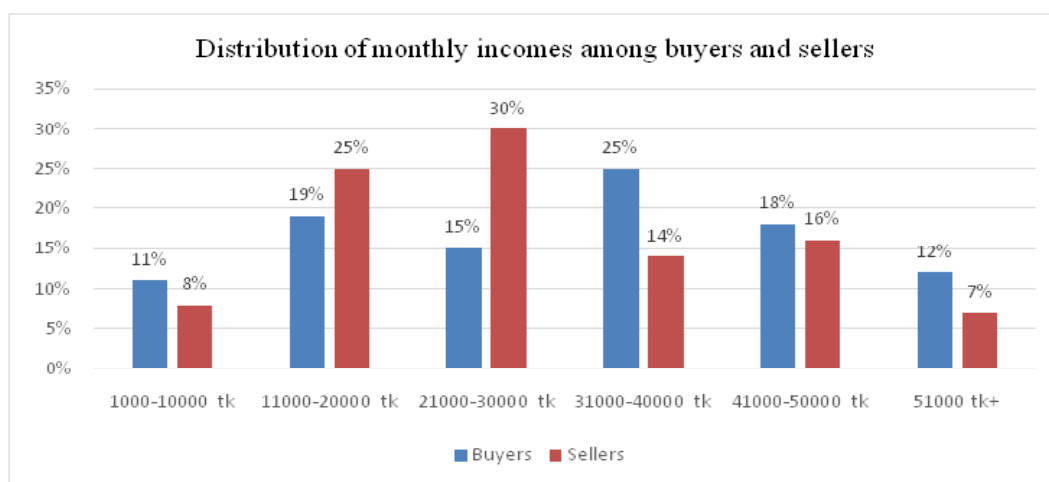
## Knowledge about Food Safety among Buyers and Sellers in a Municipality Market

Figure 2 shows that, among 101 respondent buyers, 32% of respondents were service holders, 20% were business people, 12% were bankers, 14% were garment workers, 8% were teachers, and others were 10%.

**Table 2.** Frequency distribution of educational status among the buyers and sellers (N=202).

Educational Status	Buyers (%) (n=101)	Sellers (%) (n=101)
No Education	3%	24%
Primary	8%	42%
High school	10%	24%
SSC	10%	8%
HSC	22%	2%
Graduation	47%	0%

Table 2 shows that most of the buyers were complete their graduation (47%). Besides most of the sellers were completed their primary education (42%)



**Figure 3.** Bar chart of monthly income among buyers and sellers

Figure 3 shows the monthly income of buyers and sellers. The above bar chart shows that 25% of buyers have 11000-20000 tk monthly earnings, and 11% of buyers' monthly income is between 1000-10000 tk. Besides, a maximum of 30% of the seller's monthly income is between 21000 and 30000 tk.

**Table 3.** The Response of the Buyers and Sellers to the Food Safety Knowledge Statements

Q No.	Food Safety Knowledge Statement	Buyers		Sellers	
		Yes (%)	No (%)	Yes (%)	No (%)
1	Always, contaminated foods exhibit a change in color, odor, or flavor.	51.5%	49.5%	38%	62%
2	Healthy individuals might create disease by transferring germs to food.	58.15%	41.75%	53.5%	46.5%
3	Cooked foods lack microorganisms.	48%	52%	54%	46%
4	Contact between raw and cooked foods increases the likelihood of food contamination.	77%	23%	82.5%	17.5%
5	Hygiene of the hands helps avoid food contamination.	87.5%	12.5%	46%	54%
6	An individual with a contagious illness, such as diarrhea, the flu, or a sore throat, poses a threat of food contamination.	73.75%	26.25%	37.5%	62.5%
7	The cleanliness and sanitization of cooking equipment are crucial for food safety.	46.70%	53.30%	28%	72%
8	The usage of jewelry, such as rings and watches, during food preparation causes contamination.	56.85%	43.15%	11%	89%
9	Foods that are inappropriate for eating always do not have a terrible smell and taste of spoil	78%	22%	37%	63%

Table 3 showed the food safety knowledge-related question and its response from the buyers and sellers.

**Table 4.** Correlation with socio-demographic variables and food safety knowledge of buyers.

Variables	Knowledge		P value
	Good	Poor	
<b>Gender</b>			
Male	55%	45%	0.053
Female	62%	38%	
<b>Level of education</b>			
No Education	28%	72%	0.001*
Primary	30%	70%	
High school	53%	47%	
SSC	58%	62%	
HSC	55%	45%	
Graduation	68%	32%	
<b>Training on food safety</b>			
Yes	83%	17%	0.003*
No	46%	66%	
<b>Attitude</b>			
Favourable	52%	48%	0.067
Unfavorable	44%	56%	

Table 4 shows that level of education, and training on food safety of buyers have a significant ( $p < 0.001$ ) relationship with the knowledge of food safety.

Interpretation:  $p < 0.05$  = Significant value

**Table 5.** Correlation with socio-demographic variables and food safety knowledge of sellers.

Variables	Knowledge		P value
	Good	Poor	
<b>Gender</b>			
Male	31%	69%	0.005*
Female	10%	90%	
<b>Level of education</b>			
No Education	13%	87%	0.001*
Primary	27%	73%	
High school	33%	67%	
SSC	45%	55%	
HSC	0%	100%	
Graduation	0.0%	0.0%	
<b>Training on food safety</b>			
Yes	0.0%	0.0%	0.001*
No	20.5%	79.5%	
<b>Attitude</b>			
Favourable	18%	82%	0.003*
Unfavorable	67%	33%	

In table 5 shows that, food seller has inadequate knowledge about food safety. In point of gender prospection, 90% of female have poor knowledge.

Interpretation:  $p\text{-value} < 0.05$  = Significant Value

### DISCUSSION

In the current inquiry, the city of Dhaka was chosen as the research object for the evaluation of food merchants' and customers' awareness of the importance of maintaining food safety. Previous research was used to develop questionnaires that were used in a study that was designed to be cross-sectional. The food safety knowledge and attitude questionnaire were in accordance with the requirements of Bangladesh at the national level. This study's primary objective was to evaluate the food safety awareness of customers and sellers in Dhaka, Bangladesh, as well as the food handling practices of vendors. There are, to our knowledge, relatively few studies evaluating and reporting these crucial features of street food safety in Dhaka city.

This study assessed the food safety and hygiene knowledge of customers and sellers at a municipal market. In this survey, the majority of respondents were between 18 and 78 years of old (Table 1). The majority of purchasers and vendors were male, with males accounting for 72% and 87% of the respective populations respectively (chronologically). In addition, the number of female participants was low in both the buyer and vendor categories (Figure-01). This pattern is consistent with what was discovered in earlier research, which found that the majority of food sellers are women between the ages of 20 and 40 who have completed either their second or their postsecondary education [16-20]. On the other hand, several studies have shown that the majority of people who work as food sellers are male and have either no formal education or just basic school as their greatest level of education.

This research evaluated the characteristics related to food safety knowledge among food vendors and purchasers at Mohammadpur Municipal Market. In this survey, the overall food safety awareness of merchants was poor. Nonetheless, within the individual frameworks, respondents were more educated than others about some food safety problems. For example, the majority of respondents were aware that washing hands before work, wearing gloves, hats, and aprons, and cleaning tools properly lower the risk of food contamination. They were, however, less educated about high-risk categories for food poisoning as well as specific food borne disorders and food borne microorganisms. Consistent with prior research, food vendors are more educated about hand washing and the use of protective equipment than they are about other aspects of food safety [21-23].

Our data demonstrated that education, job experience, training, and income are all strongly linked with food safety knowledge. In particular, food vendors with a postsecondary degree and food safety training indicated a larger chance of having an extensive understanding of food safety. Parallel research done in South Africa validated the conclusion by demonstrating that the educational level and professional training of meat handlers were substantially connected to their level of knowledge and food safety measures [22].

In the current research, it was found that the majority of respondents had not a solid understanding of the food sellers' and purchasers' knowledge of food cleanliness, a finding consistent with that of earlier studies [24]. In contrast, research conducted in Ethiopia, Malaysia, Iran, Korea, and Thailand found that the majority of food sellers had inadequate food hygiene skills [25-27].

So, in the present study, the level of personal and environmental hygiene appears to be fairly good, which is consistent with the findings of other studies whose authors have argued that, due to the food vendor's need to rely on repeat business to sustain their livelihood, the vendors are more likely to produce relatively safe food by maintaining the minimum required level of hygiene standards; even though a significant gap still exists.

### Limitation of the study

This research included limitations that must be taken into account when interpreting our results. This study used a cross-sectional design, which restricts the ability to identify causal pathways. Due to the unique locations of Dhaka's municipal market examined in this research, the results may not apply to the whole country.

### Recommendation

- To make the food market safer, both the people who sell food on the street and the people who buy it should undergo thorough training.
- To increase the customers' and vendors' understanding of food safety as well as their attitudes and behaviors about the issue, it is essential to implement further implications of regulations and procedures.
- Access to clean water, the provision of clean and sheltered buildings, and the implementation of efficient waste collection and disposal systems are all examples of possible actions that should be implemented to enhance food handling conditions and facilities.

### CONCLUSIONS

There is a need for increased vigilance and control of the food vendor's practices through the enforcement of regulations, proper hygienic practices, and food safety control measures by local authorities that are empowered to perform their functions without constraints, to prevent and control the potential risks and spread of food borne illnesses.

In the interest of public health, the management of mobile and stationary food vendors should include the development of coordinated, effective, integrated, and preventive strategies that emphasize vendor registration, formal training on hygienic practices, initial and periodic medical certification, and routine personal and environmental hygiene checks.

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