

Preliminary Survey on the Fish Consumer Behavior and Infrastructures of Fish Markets in Dhaka City

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Abstract: A preliminary survey was conducted in 15 fish markets of Dhaka city to determine the consumer behavior and market infrastructure and facilities. The survey revealed that most of the consumers (40.2%) preferred to consume fish daily and Rohu (*Labeo rohita*) was the most preferable fish species. Also, most of the consumers (47.8%) used to spend BDT 500-800 for buying fish in a week and they opted to buy fish which were caught from pond and fish farm and fish that were formalin free. Interestingly fish bone was the least concern criteria (6.7%) for the consumers of Dhaka city. Among the 15 fish markets, floor of 12 fish markets were made of concrete, roof of 11 fish markets were build with concrete and only 3 fish markets had ventilation system with exhaust fan. Concrete made drainage system was found in 13 fish markets and fish traders of 12 fish markets used to use the used water for rinsing and washing the fish. Energy saving bulb were used in 14 fish markets and toilet facilities were found only in 11 fish markets. Exclusive fish market office was only found in 3 fish markets and road network for fish transportation were build with concrete in all the fish market. Highest number of stalls (125) found in Jatrabari fish market while lowest number of stall found in Sukrabad fish market.

Keywords: Fish markets, Dhaka City, Consumer behavior, Infrastructure.

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I. Introduction

This sector is contributing significantly in food security through providing safe and quality animal protein; almost 60 percent animal protein comes from fish. It contributes 3.61 percent to our national GDP and around one-fourth (24.41 percent) to the agricultural GDP. More than 11 percent of total population of Bangladesh are engaged with this sector on full time and part time basis for their livelihoods. This sector also has high potential for the perspective of economic development of the country [1]. Fish marketing is not only limited to selling of fish but also includes all the activities which exert considerable impacts on the exploitation, production, distribution, preservation and transportation of fish in addition to actual sale of fish by reducing middlemen [2]. Marketing channel is the path of a commodity from its raw to finished form. Bangladesh is a country with higher social inequality; beside the hardcore poverty a large number of affluent consumers are found. This affluent group of consumers is more conscious about the health and nutrition issues of the food items, and tends to make purchase from supermarkets and chains shops, which are seems to be more trustworthy [3].

Consumers over the world are now much concern about the risk and health issues related to food intake [4]. Traditionally, people of Bangladesh like to eat fresh fish. However, chilled and dried fish are also marketed currently in large quantities in the towns and cities. Utilization and marketing distribution of fish is around 70 % fresh fish, 25% dried, and the other forms of locally processed fish include fermented products and frozen products [5]. In a research regarding the awareness of consumers, the respondents of their study 93.7% consumers are aware that various foods and foodstuffs contain hazardous chemicals, while 95.5% of them are aware that these adulterated foods and foodstuffs are harmful to their health [6]. It is well treated in consumer research that consumer's risk perception may not only be a physical issue, but also deal with other aspects such as social and financial consequences [7,8,9, 10]. Various factors that can influence consumers' fish eating behavior have been identified. Among them are product quality [11] attitudes towards choosing fish for a meal [12], involvement in seafood [13], food choice habits [14], beliefs about benefits and risks related to health [15], convenience [16], age and health involvement [17].

Consumers perceive farmed fish as being of lower quality as compared to fish captured in the wild [18, 11]. A general lack of time, knowledge, skills and abilities to prepare home meals [19] influences our global food attitudes and choices in the direction of more convenience food. The role of convenience in explaining food attitudes, food choices and consumption has been explored in several recent studies [20, 21, 22].

Still in Bangladesh, fish consumer behavior on full scale and the infrastructure and facilities in fish markets are not assessed. This preliminary survey attempted to explore the fish consumer behavior and the infrastructure and facilities in fifteen fish markets in Dhaka city, the capital city of Bangladesh.

II. Materials and Methods

2.1. Market survey:

The study was conducted based on field survey method where primary data were collected from different fish market in Dhaka city. Total number of market of the study was 15. The data were collected intensively by structured schedules.

Survey	Month
1 st market survey and Questionnaire survey	April-May
2 nd market survey	August
3 rd market survey and Questionnaire survey	November-December

2.2 Survey time:

Markets	Survey time
Jatrabari Fish Market	6.00 A.M-10.00A.M
Swarighat Fish Market	7.00A.M -11.00A.M
Muktijoddha Super Market, Mirpur-1	10.00A.M-2.00P.M
Karwan Bazar	7.00A.M-11.00A.M
Mohammadpur Krishi Market	10.00A.M-2.00P.M
Naya Bazar	8.00A.M-11.00A.M
Rayer Bazar	8.00A.M-11.00A.M
Kaptan Bazar	10.00A.M-1.00P.M
Mohammadpur Townhall Market	10.00A.M-2.00P.M
Sukrabad Fish Market	10.00A.M-12.00P.M
New Society Market, Mirpur-11	11.00A.M-2.00P.M
Shewrapara Fish Market	10.00A.M-12.00P.M
Kachukhet Market, Dhaka Cant.	3.00P.M-6.00P.M
Polashi Bazar	8.00A.M-10.00A.M
New Market	7.00A.M-10.00A.M

2.3 Questionnaire survey and data analysis:

To assess consumer behavior a survey was conducted in the above mentioned fish markets of the Dhaka city. The sample size was 224. Questionnaire was conducted to understand consumer attitudes towards the consumption of fish. Data were presented as descriptive statistics in the results.

III. Results and Discussions

1st market survey and Questionnaire survey and 3rd market survey and Questionnaire survey were conducted in April-May and November-December in 2017 and survey times were mostly in the early morning and morning. Fish consumption frequency of consumers was surveyed and presented in table 1. Most of the consumers (40.2%) preferred to consume fish daily whereas only 13.4% consumers consume fish once in a week. Preferable fish species for consumption has been presented in table 2. *Labeo rohita* (Rohu) was the most preferable fish species (22.8%) that consumers bought which might be due to the availability as well as low cost. Pangus (*Pagasius pangasius*) was the second most preferable fish species (18.8%) followed by Tilapia (16.1%) and both of them were preferable fish for availability all the year round and low cost. Though Hilsa was a popular fish but it was less preferable (6.7%) for its high price and seasonal availability. Spent range of money for buying fish (weekly) by consumers presented in table 3. Most of the consumers (48.2%) used to spend BDT 500-800 for buying fish whereas 34.4 % consumers used to spend BDT 200-500 and only 17.4% consumers used to spend BDT 800-1100. Consumers had tendency to buy fish which were from river source followed by haor/baor/beel but due to high price they opted for pond and fish farm (25%). Due to the recent widespread use of formalin for preserving fish, consumers always tend to buy fish that were formalin free (29%) while freshness and taste both closely (21% and 20.5%) competed as the criteria to be selected by consumers for buying fish.

Fish bone was the least concern criteria (6.7%) for the consumers although in developed countries it is an utmost priority. In addition to price, consumer perceptions regarding nutrition taste, safety, and appearance, might influence consumption of any fish [23, 24] which agreed with the current study. But the most determining factor for purchasing fish is nutrition [25]. Consumption of fishery products was also positively directly associated with education [26]. Higher education levels were found leading to higher purchase but did not translate into higher fish consumption [27]. Western nations have a tendency to consume more meat than other nations, particularly as their economies develop [28].

Table 1. Fish consumption frequency of consumers

Parameter	Time	Frequency	Percent
Fish Consumption frequency	Daily	90	40.2
	Three times in a week	63	28.1
	Two times in a week	41	18.3
	Once in a week	30	13.4
	Total	224	100

Table 2. Preferable fish species for consumption by the consumers

Parameter	Species name	Frequency	Percent
Preferable fish species for consumption	Rohu (<i>Labeo rohita</i>)	51	22.8
	Catla (<i>Catla catla</i>)	11	4.9
	Mrigal (<i>Cirrhinus cirrhosus</i>)	14	6.3
	Common carp (<i>Cyprinus carpio</i>)	26	11.6
	Pangus (<i>Pagasius pangasius</i>)	42	18.8
	Tilapia (<i>Oreochromis mossambicus</i>)	36	16.1
	Hilsa (<i>Tenualosa ilisha</i>)	15	6.7
	Singhi (<i>Heteropneustes fossilis</i>)	14	6.3
	Bhetki (<i>Lates calcarifer</i>)	7	3.1
	Others	8	3.6
Total	224	100	

Table 3. Consumers spent money for buying fish on weekly basis.

Parameter	BDT	Frequency	Percent
Spent range of money for buying fish (weekly)	200-500	77	34.4
	500-800	108	48.2
	800-1100	39	17.4
	Total	224	100.0

Table 4. Range (weight) of fish consumed by consumers' family

Parameter	Kilogram	Frequency	Percent
Consumed fish (weight) in family	1 to 2 kg	24	10.7
	2 to 3 kg	55	24.6
	3 to 4 kg	82	36.6
	4 to 5 kg	63	28.1
	Total	224	100.0

Table 5. Consumers' choice of fish source

Parameter	Fish habitat source	Frequency	Percent
Preferable fish Source	River	65	29.0
	Pond and Fish farm	56	25.0
	Haor/Baor/Beel	58	25.9
	Marine	45	20.1
	Total	224	100.0

Table 6. Consumers' criteria for selecting fish

Parameter	Selection Criteria	Frequency	Percent
Considering criteria to select fish	Price	22	9.8
	Freshness	47	21.0
	Taste	46	20.5
	Nutritional value	29	12.9
	Fish bone	15	6.7
	Formalin free	65	29.0
	Total	224	100.0

Different infrastructures and facilities of 15 fish markets were surveyed which is presented in table 7 and 8. Structure of floor was not made of concrete in Jatrabari fish market, Swarighat fish market and New Society Market (Mirpur-11) whereas all other fish markets' floor was made of concrete. Roof of most of the fish markets were build with tin and only the roofs of Karwan bazaar, Kaptan bazaar, Mohammadpur townhall market, and New Market were build with concrete and interestingly there was no roof in Nayabazaar. Ventilation system was present in Muktijoddha Super Market (Mirpur-1), Karwan bazaar and New Market which was operated by exhaust fan whereas other markets did not have any mechanical ventilation system. All the fish markets had concrete made drainage system except Swarighat fish market and New Society Market (Mirpur-11). Fish traders in most of the fish markets used same water for fish rinsing and washing that is repeatedly used the used water while only fish traders of Jatrabari fish market, Karwan bazaar and Rayer bazaar used fresh tap water for the same purpose. Only in Swarighat fish market and New society market (Mirpur-11) cleaning activities were carried out by market employee (cleaner) whereas in others city corporation employee (cleaner) were responsible for cleanliness of the markets.

Table 7. Infrastructures and facilities in different fish markets of Dhaka city

Name of the market	Structure of floor	Structure of roof	Ventilation system	Drainage system	Type of water used for fish rinsing and washing	Responsible person for Cleaning activities in market
Jatrabari fish market	Not concrete	Tin	Absent	Concrete	Fresh tap water	City corporation employee
Swarighat fish market	Not concrete	Tin	Absent	Absent	Used water	Market employee
Muktijoddha super market (Mirpur-1)	Concrete	Tin	Exhaust fan	Concrete	Used water	City corporation employee
Karwan Bazaar	Concrete	Concrete	Exhaust fan	Concrete	Fresh tap water	City corporation employee
Mohammadpur krishi market	Concrete	Tin	Absent	Concrete	Used water	City corporation employee
Naya bazaar	Concrete	Without roof	Absent	Concrete	Used water	City corporation employee
Rayer bazaar	Concrete		Absent	Concrete	Fresh tap water	City corporation employee
Kaptan bazaar	Concrete	Concrete	Absent	Concrete	Used water	City corporation employee
Mohammadpur townhall market	Concrete	Concrete	Absent	Concrete	Used water	City corporation employee
Sukrabad fish market	Concrete	Tin	Absent	Concrete	Used water	City corporation employee
New society market (Mirpur-11)	Not concrete	Tin	Absent	Concrete	Used water	Market employee
Shewrapara fish market	Concrete	Tin	Absent	Concrete	Used water	City corporation employee
Kachukhet market (Dhaka Cantonment)	Concrete	Tin	Absent	Concrete	Used water	City corporation employee
Polashi bazaar	Concrete	Tin	Absent	Concrete	Used water	City corporation employee
Newmarket	Concrete	Concrete	Exhaust fan	Concrete	Used water	City corporation employee

Except Swarighat fish market all the markets used to light up their respective area and trading spots with energy saving bulb. It may be mentionable that some of the stalls in Jatrabari fish market, Karwan bazaar and Nayabazaar were in open space receiving sunlight and thus did not use electric bulb in daytime. Toilet facilities were found in Muktijoddha Super Market (Mirpur-1), Kaptan bazaar, Mohammadpur townhall market, and New Market. Exclusive office dealing for fish market was present in Jatrabari fish market, Karwan bazaar, and New Market while others did have only market office for the whole market. Roads network of the markets were build with concrete which facilitates fish transportation with the main roads. The number of stall of fish traders varied in different markets according to the space available. Highest number of stalls (125) were found in Jatrabari fish market followed by Mohammadpur townhall market (122) while lowest number (20) of stalls found in Sukrabad fish market.

Table 8. Infrastructures and facilities in different fish markets of Dhaka city

Name of the market	Lighting	Toilet facilities	Fish containers	Fish market office	Road network	Number of stalls
Jatrabari fish market	Energy saving bulb	Absent	Tin/Plastic	Present	Concrete	125
Swarighat fish market	Absent	Absent	Plastic	Absent	Concrete	67
Muktijoddha super market (Mirpur-1)	Energy saving bulb	Absent	Plastic	Absent	Concrete	56
Karwan Bazaar	Energy saving bulb	Present	Plastic	Present	Concrete	106
Mohammadpur krishi market	Energy saving bulb	Absent	Plastic	Absent	Concrete	33
Naya bazaar	Energy saving bulb	Absent	Plastic	Absent	Concrete	23
Rayer bazaar	Energy saving bulb	Absent	Plastic	Absent	Concrete	25
Kaptan bazaar	Energy saving bulb	Present	Plastic	Absent	Concrete	31
Mohammadpur townhall market	Energy saving bulb	Present	Plastic	Absent	Concrete	122
Sukrabad fish market	Energy saving bulb	Absent	Plastic	Absent	Concrete	20
New society market (Mirpur-11)	Energy saving bulb	Absent	Plastic	Absent	Concrete	39
Shewrapara fish market	Energy saving bulb	Absent	Plastic	Absent	Concrete	21
Kachukhet market (Dhaka Cantonment)	Energy saving bulb	Absent	Plastic	Absent	Concrete	26
Polashi bazaar	Energy saving bulb	Absent	Plastic	Absent	Concrete	24
Newmarket	Energy saving bulb	Present	Plastic	Present	Concrete	58

IV. Conclusion

From the preliminary survey, it might be concluded that more in-depth survey should be conducted to assess the fish consumer behavior. This survey revealed some strengths and weaknesses of infrastructures and facilities in fish markets of Dhaka city which would give a future direction for the proper development and management.

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