



Consumers' Preference for Dried Fish with Emphasis on Packaging in Dhaka city

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Abstract

Consumers' preference for dried fish with emphasis on packaging in Dhaka city was investigated by survey method using a structured questionnaire. A total of 45 consumers (15 in each market) in the open-air retail markets of Dhaka city were selected by purposive sampling technique. Majority of the respondents were male (84%), in the age group of 15-59 years (84%) and having below the Higher Secondary Certificate (HSC) level of education (75%). Most of the consumers (73%) came from the low-income groups. Around 87% like to eat dried fish. Around 53% of consumers buy dried fish weekly, and they spend monthly on an average of 370 BDT. More than 90% of consumers preferred to consume dried fishes with satisfaction on the existing quality. However, 96% of consumers also showed a willingness to pay 10-15% higher price if packaging and quality are improved. Based on the consumers' preferences, this study indicated that there is good potential for quality packaged dried fishes, which is readily accessible and affordable for the consumers.

Keywords: Consumers' preference, consumers' acceptability, dried fish, packaging, retail markets, Dhaka

Introduction

The preference and acceptability of a food product are mainly based on sensory characteristics of food such as taste, texture, aroma, and appearance (Piqueras-Fiszman & Spence, 2015). If a product has low sensory acceptability or nutritional composition

or brand cannot get it accepted by the consumers (Hough et al., 2006; Sosa et al., 2008). On the other hand, if a product has high sensory acceptability, there are additional features that have to be ensured to get the overall acceptability, such as health attributes, price, packaging, process characteristics and convenience (Brunsø et al., 2002; Odoli, 2015).

The consumers' preference for fish consumption is influenced by the geographic, social and cultural features of the consumers (Burger et al., 1999; Pieniak et al., 2011). The preference is also influenced by sensory characteristics such as taste, smell, texture and non-sensory aspects such as beliefs, behaviour, personal characteristics, risk assessment (Honkanen et al., 2005). In the case of dried fish, freshness, size and colour are the main influencing factors for consumption. Moreover, the variety, dryness, colour, bone content, moisture content and fungal growth are the main factors affecting the buying decisions for dried fish (Hirimuthugoda et al., 2014). In Bangladesh, the preferences is largely a function of localized cultural preferences. Dried fish consumption is highest in Chittagong and Sylhet divisions, moderate in Dhaka division, low in Barisal and Rashjahi divisions, and nearly non-existent in Khulna division. There are also preferences about dried fish consumptions within and between regions. Markets are also segmented along ethnic lines between tribal and Bengali population (Hossain et al., 2013).

Consumers are now very much conscious about the quality of dried fish and there are frequent complaints regarding the quality of the dried fish available in the markets of Bangladesh. The quality of most of the traditional sun-dried fishes available in the market are not suitable for human consumption (Kamruzzaman, 1992; Saha, 1999). A considerable amount of dried products undergo quality deterioration and contamination by pathogens due

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to lack of proper packaging and storage facilities. Additionally, the use of hazardous insecticides to stop the insect infestation during drying and storage is also reported (Flowra et al., 2013; Marine et al., 2014; Payra et al., 2016). Proper packaging could reduce the deterioration of quality of dried products and attract the health conscious and high income group consumers (Faruque et al., 2012). Like other products, the packaging is not developed yet for dried and smoked fish in many developing countries (Ward, 2003; Abolagba & Nuntah, 2011). In Bangladesh, dried fish is usually packed in plastic and jute bags for storage and transportation and is generally sold in open-air markets (Rabbanee et al., 2012; Payra et al., 2016). The dried fish marketing has been started by some retail stores under ordinary packaging with polythene (PE) pouch, which does not however ensure keeping quality and improve shelf life of these products (Hossain et al., 2015; Pradhan et al., 2017). Therefore, it is often a challenge to ensure year round supply of quality dried fishes to the consumers.

Few studies have focused on consumers' preferences towards dried fish (Sugathapala et al., 2012; Hossain et al., 2013; Hirimuthugoda et al., 2014; Odoli, 2015). However, there is no study found particularly on consumers' preference for dried fish, focused on the packaging. Therefore, this study aimed to evaluate the consumers' preference and acceptability for dried fish with emphasis on packaging in Dhaka city, Bangladesh as an indicator to find the marketing potential of packaged dried fishes in the market.

Materials and Methods

The socio-economic conditions, as well as preference of the consumers for buying dried fishes with emphasis on packaging, were investigated by the survey method utilizing a structured questionnaire. The study was carried out in Dhaka city of Bangladesh during July 2017. The city was chosen for the high and diverse urban population with people from all over the country. Purposive sampling technique was used for selecting three open-air retail markets from Mohakhali, Karwan Bazar, and Bangshal area of Dhaka respectively. The Bangshal kitchen market was composed of two small markets namely Naya Bazar and Babu Bazar. According to Dhaka Metropolitan Fish and Vegetables Small Traders Association, around 400 fish markets are operated in Dhaka city (Sarker et al.,

2009). There are few dried fish shops operational in most of the fish markets. A total of 45 (15 in each market) respondents were selected by purposive sampling technique based on availability for face-to-face interview from the three markets. A consumer is defined as a person who purchases goods and services for personal use.

The questionnaire was developed, pre-tested in field situations and necessary modifications were made before collection of data. The questionnaire was organized to investigate the consumers' socio-economic aspects (gender, age, family size, education and occupation) as well as consumers' preferences and expectations on different aspects like quality, packaging, price and overall attractiveness of dried fish.

Descriptive analyses using SPSS 20 is presented.

Results and Discussion

Karwan Bazar retail market is the largest market for dried fish in Dhaka city. This market also acts as a wholesale market for dried fish in the city. Bangshal kitchen market is a densely populated market in the old Dhaka area. Very few dried fish retailers (7-10 in each) were involved in Mohakhali and Bangshal kitchen markets, whereas more than 15 retailers were engaged in Karwan Bazar retail market. On an average 11 kg of dried fishes were traded daily by each of the retailers in these markets.

The majority of the consumers (84%) were males in the three open-air markets of Dhaka city (Table 1). It is reported in Bangladesh that males dominate purchase of fish and fishery products for domestic consumption. Rana et al. (2014) observed a similar trend, where 59.4% were male, and remaining were female even in the retail chain stores of Dhaka city.

A majority of the respondents (84%) were under the age group of 15-59 years (Table 1), which is considered as the working and active group of population in Bangladesh (HIES, 2017).

With regards to family size, half of the respondents (49%) came from medium (5 to 7 members) and 31% from small (up to 4 members) families (Table 1). The average family size of the consumers was 5.5, which is higher than the national average of 4.0 (HIES, 2017). In the present study, 47% of consumers are either uneducated or have a primary level of education, and only 18% had a bachelors degree.

Table 1. Demographic and socio-economic factors influence the consumers' preference for dried fish in Dhaka city. (n=45)

Sl. No.	Variables	Category	Frequency	Percentage
1	Gender	Male	38	84.4
		Female	7	15.6
2	Age	<15 years	2	4.4
		15-59 yearse	38	84.4
		≥60 years	5	11.1
3	Family size	Small (up to 4)	14	31.1
		Medium (5-7)	22	48.9
		Large (8 or more)	9	20
4	Education	Uneducated	10	22.2
		Primary (up to class 5)	11	24.4
		Secondary (class 6-10)	13	28.9
		HSC	3	6.7
		Bachelor	8	17.8
5	Occupation	Business (small scale)	16	35.6
		Lower class job	12	26.7
		Mid to higher class job	5	11.1
		Labourer	5	11.1
		Housewife	5	11.1
		Student	2	4.4

The rest (36%) had either secondary or higher secondary level of education (Table 1). In the case of fresh fish consumption, education positively influences the general preference of consumers as it educates consumers about the health and other benefits of fish consumption (Kinnucan et al., 1993; Trondsen et al., 2004). On the contrary, it negatively influenced the consumers' preference for dried fish in Dhaka city. This study indicated that less-educated consumers usually purchase dried fishes from open-air markets. Odoli (2015) observed a similar result in Kenya that the consumption of dried fish was negatively influenced by education, where high consumption frequency was evident among less-educated consumers.

Among the consumers, 36% were involved in business and 27% in a lower class job like caretaker, cleaner, restaurant worker garment worker etc having lower than bachelor degree. Additionally, 11% of consumers came from each of the labourers, homemakers, and mid to higher class job (job with bachelor degree) holders (Table 1). The business indicated small scale businesses like a small shop, part-time business, etc. There is a positive relationship between education and occupation. A similar result was observed by Obiero et al. (2014), where

education primarily determines the consumers' occupation as well as the income. This income directly influences the preference and acceptability of a product like dried fish. In this case, lower class job holders and small scale businessmen preferred to buy dried fish from open-air markets.

Majority of the respondents (91%) in the markets preferred dried fish and only a few (9%) did not prefer dried fish but bought it for their families (Table 2). More than 90% of consumers like dried fish due to its unique taste. However, the households' consumption of dried fish are different in different regions. Dried fish consumption is comparatively moderate in Dhaka compared to Chittagong and Sylhet division (Hossain et al., 2013). Consumers are now conscious about the quality of dried fish; hence, there are frequent complaints about the quality of the dried fish available in the market (Kamruzzaman, 1992; Saha 1999).

It was observed that the consumers usually purchased a total of 20 dried fish species from those three markets. Among those only five were marine species and remaining were freshwater fish. The overall preference was observed as Bombay-duck > Indian River shad > small Prawn > Ganges river

Table 2. Consumers' preferences for dried fishes and opinions towards quality and packaging in Dhaka city. (n=45)

Sl. No.	Variables	Category	Frequency	Percentage
1	Preference of dried fish	Yes	39	86.7
		Moderate	2	4.4
		No	4	8.9
2	Buying interval of dried fish	Weekly	24	53.3
		Fortnightly	11	24.4
		Monthly	10	22.2
3	Monthly expenditure for dried fish in BDT	≤100	14	31.1
		101-500	21	46.7
		501-1000	5	11.1
		>1000	5	11.1
4	Satisfaction on the existing quality of dried fish	Yes	32	71.1
		Moderate	12	26.7
		No	1	2.2
5	Response for the improved and packaged dried fish	Buy more	37	82.2
		good	8	17.8
6	Preferable pack size in grams	50	12	26.7
		100	27	60.0
		500	4	8.9
		1000	2	4.4
7	Agreement on 10-15% excess price for packaging	Yes	43	95.6
		No	2	4.4

sprat. Freshwater fish were preferred than marine fishes except for the Bombay-duck. However, the availability and consumption of marine dried fish are higher in Bangladesh. Consumers consume the majority of dried fish in spring and early monsoon when freshwater fish availability from capture fisheries and aquaculture are low (Hossain et al., 2013). In addition, the consumption depend on localized cultural preferences, for instance, residents of Chittagong division along the coastal belt preferred marine dried fish almost exclusively, while consumers in Sylhet and Dhaka including Mymensingh region consumed both dried freshwater and marine fish (Hossain et al., 2013).

It is observed that 53% of consumers purchase dried fish weekly, 24% quarterly and 22% monthly in Dhaka city (Table 2). It indicates that most of the consumers buy dried fish weekly in the open-air market. The usual practice among Bangladeshi population is to go to the kitchen market weekly for purchase of daily households provisions.

Household expenditure is an important variable used in measuring household purchasing power

(Amao & Ayantoye, 2014). It was found that the consumers spent on an average of 370 BDT monthly for buying dried fish in Dhaka city. The majority of the consumers (78%) spent about 500 BDT or less every month for purchase of dried fish in Dhaka city (Table 2). It is also evident in the present study that the consumers spent less for dried fish, as most of them were from lower income groups (Table 1).

Most of the consumers (98%) were satisfied or moderately satisfied with the existing quality of dried fish in the open-air markets of Dhaka city (Table 2). This result is against the general perceptions of the consumers about dried fish, as most of the consumers of Bangladesh had a frequent complaint about the quality of the dried fishes available in the market (Kamruzzaman, 1992; Saha 1999). Indicating the lack of knowledge on food quality and safety by the consumers of dried fish (Table 1).

In addition to quality, packaging plays a vital role in the purchase preference of the consumers. In addition to extending shelf life, proper packaging ensures the delivery of safe, whole and attractive

foods to the market (Kilcast & Subramaniam, 2000). The survey revealed that 82% of consumers would buy more dried fish if packaging and quality of the dried fish is improved (Table 2). A similar trend was observed in Kenya, where the consumers of the middle-income class promise to accept new dried fish products if the overall quality could be guaranteed (Odoli, 2015). Therefore, there is a scope to produce packaged and quality dried fish in the market, which can be sold throughout the country.

About 60% of consumers showed a willingness to buy 100 g pack and 27% to 50 g pack, and only 9% to 500 g pack (Table 2). Price is an important factor for choosing the smaller size pack. Another reason for higher preference for small packets could be that, only small amount is required to add flavour to a dish and it is most commonly purchased in quantities of 50 to 250 g (Hossain et al., 2013). Therefore, there is a market potential to produce dried fishes with proper package size which can be more accessible and affordable for consumers in the country.

It was seen that 96% of consumers agreed to pay premium of 10-15% for getting quality products with proper packaging (Table 2). A similar outcome was observed in Kenya, where the middle-income consumers showed a willingness to buy dried capelin at a higher price if the quality is improved, especially appearance (Odoli, 2015). These findings will allow the processors to introduce dried fish of that quality under affordable packaging conditions.

The majority of the dried fish consumers in the open-air markets of Dhaka city were not highly educated and had lower incomes. Their family size was larger than the national average. More than 90% of the consumers prefer dried fish with satisfaction on the existing quality. However, they showed a willingness to buy more dried fish if the packaging and quality could be improved and even would agree to pay more for this quality dried fish. Processor must engage in producing quality dried fish with good packaging, which will eventually increase the accessibility and acceptability of the products.

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References

- Abolagba, O. J. and Nuntah, J. N. (2011) Processing and distribution of smoked *Clarias* spp. in Benin City, Edo State. *Int. Res. J. Biotechnol.* 2(9): 213-219
- Amao, J.O. and Ayantoye, K. (2014) Consumer preference and consumption pattern for selected forms of fish in Oyo State, Nigeria. *Int. J. Sci. Environ. Tech.* 3 (3): 841–860
- Brunso, K., Fjord, T.A. and Grunert, K.G. (2002) Consumers' food choice and quality perception—Working paper no 77. 60p, The Aarhus School of Business, Aarhus, Denmark
- Burger, J., Stephens, W.L., Jr., Boring, C.S., Kuklinski, M., Gibbons, J.W. and Gochfeld, M. (1999) Factors in exposure assessment: ethnic and socioeconomic differences in fishing and consumption of fish caught along the Savannah River. *Risk Anal.* 19(3): 427-438
- Faruque, M. O., Nazrul, K. S., Tonny, U. S., Islam, K. R., Dey, S. C., Mona, S. J. and Saha, D. (2012) Status of an ideal dry fish market of Bangladesh: A study on Asadganj dry fish market, Chittagong. *Int. J. Life Sci. Biotechnol. Pharma. Res.* 1(3): 214-225
- Flowra, F. A., Tumpa, A. S. and Islam, M. T. (2013) Study on the insect infestation of dry fishes at Singra. *J. Asiat. Soc. Bangladesh Sci.* 39(2): 273-277
- HIES (2017) Household income and expenditure survey 2016. 85p, Bangladesh Bureau of Statistics (BBS), Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka
- Hirimuthugoda, N.Y., Pethiyagoda, N.A. and Madusanka, S.T. (2014) Factors affecting the consumer preference and consumer buying behavior of dried fish: A case of Southern province in Sri Lanka. Paper presented at the International Symposium on Agriculture and Environment, Ruhuna, Sri Lanka, 27 November 2014
- Honkanen, P., Olsen, S.O. and Verplanken, B. (2005) Intention to consume seafood—the importance of habit. *Appetite.* 45(2): 161-168
- Hossain, M.A.R., Belton, B. and Thilsted, S.H. (2013) Preliminary rapid appraisal of dried fish value chains in Bangladesh. 41p, WorldFish, Dhaka, Bangladesh
- Hossain, M.M., Hossain, M.D., Noor, M.A., Haque, A.S.M.T. and Kabir, M.A. (2015) Quality aspects of some dried fish products collected from different super shops of Dhaka city in Bangladesh. *J. Sylhet Agril. Univ.* 2(2): 283-287
- Hough, G., Wakeling, I., Mucci, A., ChambersIV, E., Gallardo, I. M., Alves, L.R. (2006) Number of consumers necessary for sensory acceptability tests. *Food Qual. Prefer.* 17(6): 522-526

- Kamruzzaman, A. K. M. (1992) Qualitative evaluation of some commercial dried fish products of Bangladesh—MS Thesis. 37p, Department of Fisheries Technology, Bangladesh Agricultural University, Mymensingh, Bangladesh
- Kilcast, D. and Subramaniam, P. (Eds.). (2000) The stability and shelf-life of food, 352 p, Woodhead Publishing, Cambridge, UK
- Kinnucan, H., Nelson, R. and Hiariey, J.U.S. (1993) Preferences for fish and seafood: An evoked set analysis. *Mar. Resour. Econ.* 8: 273-291
- Marine, S. S., Hossain, M. A., Rashid, A., Islam, M. A. and Bari, S. M. (2014) Marketing strategies for dry fish in Sylhet district of Bangladesh. *Bangladesh Res. Pub. J.* 10(2): 151-169
- Obiero, K.O., Opiyo, M.A., Munguti, J.M., Orina, P.S., Kyule, D., Yongo, E. and Charo-Karisa, H. (2014) Consumer preference and marketing of farmed Nile Tilapia (*Oreochromis niloticus*) and African Catfish (*Clarias gariepinus*) in Kenya: Case Study of Kirinyaga and Vihiga Counties. *Int. J. Fish. Aquat. Stud.* 1(5): 67-76
- Odoli, C.O. (2015) Drying and smoking of Capelin (*Mallotus villosus*) and Sardine (*Sardinella gibbosa*)—the influence on physicochemical properties and consumers acceptance—Doctoral Dissertation. 203p, Faculty of Food Science and Nutrition, School of Health Sciences, University of Iceland. Iceland
- Payra, P., Maity, R., Maity, S. and Mandal, B. (2016) Production and marketing of dry fish through the traditional practices in West Bengal coast: Problems and prospect. *Int. J. Fish. Aquat. Stud.* 4(6): 118-123
- Pieniak, Z., Kolodziejczyk, M., Kowrygo, B. and Verbeke, W. (2011) Consumption patterns and labelling of fish and fishery products in Poland after the EU accession. *Food Control.* 22(6): 843-850
- Piqueras-Fiszman, B. and Spence, C. (2015) Sensory expectations based on product-extrinsic food cues: An interdisciplinary review of the empirical evidence and theoretical accounts. *Food Qual. Prefer.* 40: 165-179
- Pradhan, N., Shrestha, M. K., Rai, S., Jha, D. K. and Sah, S. K. (2017) Diversity and marketing of dried fish products in Nepal. *Nepalese Journal of Agriculture and Forestry University.* 1: 139-152
- Rabbanee, F. K., Yasmin, S. and Haque, A. (2012). Women involvement in dry fish value chain approaches towards sustainable livelihood. *Aust. J. Bus. Manag. Res.* 1(12): 42-58
- Rana, S.M.S., Osman, A. and Islam, M.A. (2014) Customer satisfaction of retail chain stores: evidence from Bangladesh. *J. Asian Sci. Res.* 4(10): 574-584
- Saha, S. C. 1999. Studies on production, marketing and nutritional aspects of traditional dried products of Bangladesh—MS Thesis. 62p, Department of Fisheries Technology, Bangladesh Agricultural University, Mymensingh, Bangladesh
- Sarker, B. S., Hasan, M., Rahman, M. S. and Rahman, A. A. (2009) Non-conventional fishery by-products of fish markets in Dhaka Metropolis, Bangladesh. *Asia Pac. J. Rural Dev.* 19(2): 57-72
- Sosa, M., Martinez, C., Marquez, F. and Hough, G. (2008) Location and scale influence on sensory acceptability measurements among low-income consumers. *J. Sens. Stud.* 23(5): 707-719
- Sugathapala, R. M. N. S., Suntharabarathy, T. V. and Edirisinghe, U. (2012) Salt based dry fish processing and marketing by fishers of Minneriya reservoir in Sri Lanka. *Trop. Agric. Res.* 23 (4): 357-362
- Trondsen, T., Braaten, T., Lund, E. and Eggen, A. E. (2004) Consumption of seafood—the influence of overweight and health beliefs. *Food Qual. Prefer.* 15: 361-374
- Ward, A. (2003) A study of the trade in smoked-dried fish from West Africa to the United Kingdom—FAO Fisheries Technical Paper-981. 17p, Food and Agricultural Organization, Rome, Italy