Fresh and Dried Fish Consumption and its Contributory Factors: A Study of Malappuram, Kerala

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ABSTRACT

The study investigates fresh and dried fish consumption patterns and factors determining fish purchase among the people of Malappuram district, Kerala. 200 fish consumer households belonging to varied socio-economic backgrounds were surveyed using a structured questionnaire. Garret ranking identified 'convenience perception' (14.92), 'provision of home delivery' (8.62), 'availability of dressing facility' (8.61), 'sensory perception' (7.75) and 'information on fish sold in market' (7.26) as the most important factors influencing fish purchase among the households. The factors identified will guide in preparation of strategies for modern fish business aiding the emerging digital fish market ecosystem in our country. The per capita fish consumption estimated at 2.6 kg/person/month is far higher than the national average. Sardine and mackerel were the two most important species preferred by the respondents. Majority of the families were found to consume dried fishes 1-2 times a week. The study indicated a healthy level of per capita fresh fish consumption while further efforts can be made to improve the dried fish consumption among the households. The results will aid policy makers in designing strategies aimed at bringing fish consumption to recommended dietary intake levels in poorly faring states and territories of the country.

INTRODUCTION

Fish and seafood offer a much healthier diet than any other terrestrial meat products (Bogard et al., 2015). Being a great source of unsaturated fatty acids, amino acids, vitamins and minerals, coupled with its low-fat content (Yaktine & Nesheim, 2007) fish always tops the list as an important cuisine for people all around the world (Burger et al., 1999; Turan et al., 2006) making any diet sustainable, safe and nutritious. On a global basis, fish is considered as the third major source of dietary protein after cereals and milk (FAO, 2020). In major studies (Brunso, 2003; Gross, 2003), consumers have regarded fish as healthier compared to other non-vegetarian foods. Significant contribution of fisheries sector is evident in the fight to end global hunger, achieve food security, and improve nutrition (Bennet et al., 2021). 20 per cent of the total animal protein intake of 3.1 billion people is met by fish with per capita food fish consumption rising from a mere 9.0 kg in 1961 to 20.5 kg in 2018 (FAO, 2020).

According to National Sample Survey Organisation (NSSO) report, the monthly per capita fish consumption of urban and rural

India is 0.27 kg and 0.25 kg. The ICMR recommendation of fish consumption is 12 kg/year, which is yet to be achieved in India with a predicted per capita fish consumption of 6.6 kg in 2030 by World Bank (Msangi et al., 2013). Government of India has also set a target of 20 MT fish production by the year 2022-23 by laying renewed focus on the sector through a flagship scheme "Blue Revolution" (Shasani et al., 2020). But an entirely different situation exists in Kerala state with a per capita fish consumption of 2.26 kg in rural and 2.21 kg in urban areas (NSSO, 2012). Being a coastal state and leading fish producer of the country, both fresh and dried fish are important items of Kerala diet. Identifying the factors influencing consumption of fish and studying consumption behaviour aids government in alleviating hunger and malnutrition among deprived sections (Sajeev et al; 2021).

Malappuram is one of the most populous districts of Kerala accommodating about 13% of the total population of the state. As per NFHS-5 (2019-20), Malappuram district just behind Wayanad has 29.4 per cent of its children under 5 years reporting stunting which indicates an increase of 3.1 per cent from 2015-16 (NFHS-4). The present study was designed to bring out the existing status of fresh and dried fish consumption among a selected rural-urban, highly non-vegetarian population of Malappuram district, Kerala along with the various factors influencing the fish purchase. Fish consumption is proven to alleviate iron deficiency anaemia and hence the higher incidence of anaemia among women and children of Malappuram in contrast to Kerala figures also enables the district suitable for this study. The socio-personal characteristics of the respondents were also measured. The results can be used for policy making towards achieving recommended fish consumption and for refining existing fish marketing strategies.

METHODOLOGY

A structured pre-tested questionnaire was used and the survey was carried through personal interview of 200 households. Stratified Probability Proportional Sampling technique was used for the study purpose. Each household survey took roughly 50 minutes to complete. Frequency and percentages were used for the analysis of socio-economic characteristics. Henry Garret Ranking Test was done to estimate and analyse the major factors affecting the consumption of fish among the respondents. Using this technique, the participants were asked to specify ranks for all factors ranging from 1 to 5, where 5 ranks the most important and 1 ranks the least important. The results of the rankings thus obtained were converted into percentage score value. Following Henry Garret (1969), the score was computed.

RESULTS AND DISCUSSION

Fish consumption profile of respondents

The per capita fish consumption of the surveyed population was estimated as 2.6 kg/month (Table 1) which is far higher than the national average (0.25 kg/month) and on par with the state average (2.5 kg/month). The study also recorded appreciable per capita consumption in respect of chicken (0.8 kg/month), beef (0.6 kg/month) and mutton (0.4 kg/month). However, pork consumption (0.02 kg/month) was low due to religious taboos and its poor

Table 1. Per capita monthly consumption of fish v/s other meat

S.No.	Items consumed	Per capita consumption (kg/month)
1.	Fish	2.6
2.	Chicken	0.8
3.	Beef	0.6
4.	Mutton	0.4
5.	Pork	0.02

availability in meat markets of the district. The study revealed that nearly half of the respondents (49%) consumed fish once in 2 days followed by 40.5 per cent who consumed fish on a daily basis. Rest 10 per cent and 0.5 per cent consumed fish 2 times a week and weekly once. The quantity of fish purchased at a time was assessed and about 99.5 per cent of the respondents purchased 0.5-1.0 kg of fish at one time. The purchase and consumption pattern of fish explains the high per capita consumption in line with state average.

The most frequently purchased fish was sardine among huge majority (91%) of the surveyed respondents followed by mackerel (60%). About 20% of the respondents purchased sole fish while cod fish was purchased by 14 per cent of the respondents (Table 2). The other most purchased species included prawns (8%), squid (8.5%), tuna (6.5%), tilapia (4.5%), pomfret (5.5%), shark (3.5%), Malabar trevally (3%), threadfin bream (2.5%), seer fish (4%), clams (1.5%), pearl spot (1%) and ribbon fishes (0.5%). It is evident that being a coastal district the fish purchased and consumed the most are marine species. Sardine and mackerel were rated as the most favourite fishes of 50 per cent and 17 per cent the respondents thus topping the list. The other species like cod fishes (35%), prawns (20%), sole fishes (10%) and pearl spot (10%) were also widely favoured by the respondents. Majority (97%) preferred to consume fish both at dinner and lunch whereas 2 per cent preferred to have fish for all the three meals of the day and 1 per cent preferred to have fish during dinner and breakfast.

Factors affecting fish purchase and consumption among the respondents

The factors influencing the selection and evaluation of food products including fish broadly includes three categories namely

Table 2. Most purchased fish species in Malappuram, Kerala

S.No.	Fish Species	Purchased by (%)
1	Sardine	91
2	Mackerel	60
3	Sole fish	20
4	Cod fish	14
5	Squid	8.5
6	Prawns	8
7	Tuna	6.5
8	Pomfret	5.5
9	Tilapia	4.5
10	Seer fish	4
11	Shark	3.5
12	Malabar trevally	3
13	Threadfin bream	2.5
14	Clams	1.5
15	Pearl spot	1
16	Ribbon fish	0.5

products, indicators and environment (Sparks & Shepherd, 1994). These factors vary with the consumers and are crucial to understand the important drivers and barriers for fish consumption. Increased health, safety and quality consciousness among Keralites have found to create new drivers and barriers to fish consumption (Sajeev et al., 2019) with changing purchase behaviour and choice of market (Sajeev et al., 2021). To analyse the preference of respondents towards the fish purchase and consumption, Henry's Garret Ranking method was applied. Among the 15 factors analysed; convenience perception ranked as the first and foremost important factor influencing the purchase behaviour of the respondents (Table 3). Convenience means the saving of time, physical or mental energy at one or more stages of overall meal acquisition process. It includes the planning, shopping, storage, preparation, consumption, cleaning and disposal of fish waste as well as leftovers (Gofton, 1995; Olsen et al., 2007; Bech, 2001). Handling, dressing and cooking of fish is inconvenient and time consuming for most modern families (Sajeev, 2021). Hence, the consumers surveyed expressed high priority for convenience perception. The factors convenience and sensory perception were found having very important role in fish purchase and consumption of mainstream population in many studies (Gofton, 1995; Leek et al., 2000; Birch et al., 2012). The availability of home delivery and availability of dressing facility were the second and third important factors regarded by the respondents while purchasing fish for consumption. Sensory perception emerged as the next important factor determining fish purchase and consumption among the respondents. The smell, texture and odour of the fish serve as the important indicators for the sensory perception and evaluation (Prabhakar et al., 2020). Accordingly, information about the fish sold in market and price of the fish were considered important while purchasing the fish. The above finding reveals the immense scope for modern and online fish marts in the district which can deliver cleanly cut and dressed fish to consumer doorsteps.

Price of fish ranked as next important factor affecting fish purchase and consumption of the surveyed consumers (Table 3). The high average retail fish prices nearing Rs. 200/kg prevailing in Kerala during the period of study (2020-2021) was not found acting as a barrier for mainstream population of Malappuram. Price acting as a barrier to purchase of fish was documented earlier (Birch et al., 2012; EUMOFA, 2017; Helsedirektorat, 2020) while the driving effect of affordable fish price in purchase (Prasad and Madhavi, 2014; Bhuyan et al., 2017) was also confirmed earlier. Consumers in Malappuram also accorded importance to safety of fish. Safety and minimising hazardous outcomes have been considered as one of the aspects in the purchase and consumption of fish (Bredbenner et al., 2007). Consumption of unsafe food contaminated with hormones, antibodies or mercury levels can lead to severe health problems to those consuming it. Another important driver was Fish quality which attributes to the product safety, nutritional content, freshness, quality and physical condition of the fish (Bremner, 2000). Quality is a factor related strongly to raw material itself (Grunert, 2002) and also connected to visual cues like muscle structure (Wesson et al., 1979). Consumers of Malappuram also rated 'Knowledge of fish recipes' as an important factor in meal preparation. Food preparation involves the

Table 3. Factors influencing fish purchase and consumption among the respondents

S.No.	Particulars	Total Score	Contribution (%)
1	Price of fish	9310	6.61
2	Availability of favourite fish	7257	5.15
3	Market accessibility	8861	6.29
4	Health benefits	7110	5.04
5	Safety of fish	8941	6.34
6	Quality of fish	7171	5.09
7	Convenience Perception	21028	14.92
8	Sensory Perception	10928	7.75
9	Knowledge of fish recipes	8964	6.36
10	Place of origin of fish	7051	3.18
11	Source of fish	4482	3.18
12	Production Method	5332	3.78
13	Information on fish sold in market	10236	7.26
14	Availability of dressing facility	12135	8.61
15	Provision of home delivery	12146	8.62
	Total	140952	

individual's knowledge of preparing food (Gofton, 1995) thus making it important for fish purchase and consumption. The district being one with very famous local cuisines and recipes, this factor assumes much importance. The knowledge of consumer is a multidimensional construct which involves both the familiarity and expertise the consumer has with the product (Alba & Hutchinson, 1980).

Dried fish consumption among the respondents

Dried fish have a longer storage life when compared to fresh fishes and is a great source of protein, essential fatty acids, vitamins and minerals (Siddique & Aktar, 2011). It has a greater demand among the consumers during the lean seasons or the fishing ban time due to its greater shelf-life (Das et al., 2013). The study documented the dried fish consumption pattern among the fish consumers of Malappuram. Among the fresh fish consumers surveyed, 95 per cent had consumed dried fishes and 33 per cent of them consumed it twice a week (Table 4). Further, 27.5 per cent and 21 per cent of the respondents consumed dried fishes once weekly and monthly. However, per capita dried fish consumption was found to be declining in Kerala due to the belief among consumers that dried fish contribute to lifestyle diseases. Fear of the use of harmful chemicals in fish drying was another major reason attributed for decline in consumption (Sajeev et al., 2020).

CONCLUSION

Being rich in essential nutrients and minerals and providing good health, fish has gained immense popularity than any other

Table 4. Dried fish consumption among the selected respondents of Malappuram

S.No.	Characteristics	Percentage
1.	Monthly once	21
2.	Twice a week	33
3.	Weekly once	27.5
4.	Thrice a week	13.5
5.	Never	5

terrestrial meat. Kerala is one of the important fish producing state in India and the fish consumption level is incredibly higher than the national average. The fish purchase and consumption pattern of the consumers in Malappuram was found to be determined by various factors like convenience perception, availability of home delivery and dressing facility, sensory perception and information of fish sold in the market. Integrating the factors influencing fish consumption of a highly fish-eating population like that of Malappuram can help policy makers to design programmes aimed at increasing fish consumption in poorly faring states and territories to the recommended levels of dietary intake. The factors identified can also guide in preparation of modern fish business strategies.

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