

# **A Study on Consumers' Behavior and Factors Influencing the Consumption of Fish in Selected Districts of North Karnataka, India**

## **ABSTRACT**

Fish and fishery products are one of the most significant sources to meet sufficient animal based protein. Knowledge of preference for fish is important for producers, consumers, and traders at micro-economic level and also for policymakers and planners at macroeconomic level. The present study has made an attempt to analyze the consumers' preference towards fish consumption in Dharwad and Belgaum districts of North Karnataka, India. Sixty fish consumers were randomly selected from wholesale-cum retail fish markets. Descriptive statistics and multiple linear regression were employed to analyze socio-economic characteristics, consumers' preferences, and factors influencing the consumption of fish. Majority of the respondents (65 %) belonged to the age group of 20 to 40 years. Most of the consumers (30 %) visited the fish market occasionally and one-third (33 %) of them purchased 0.5-1.0 kg of fish per visit to the market. A significant proportion (66%) of them preferred to buy fish in cut pieces and 68 per cent consumers have emphasized on freshness. It was observed that around 63 per cent of consumers were comfortable to pay Rs. 100 to 200 per kg of fish. Regression results revealed that age (0.168), family income (0.598), and family size (0.131) are positive and significantly influences which implies that a unit increase in age, family income, and family size will increase fish consumption by 0.16, 0.59 and 0.13 kgs, respectively.

**Key words:** *consumer behavior, consumption habit, factors influencing*

## **1. INTRODUCTION**

India is the second largest fish producing country in the world after China and contributes about 7.58 per cent to the global production. India touches its all-time high by producing 14.16 million metric tons of fish during 2019-20. The fisheries sector contributes 1.24 per cent to pooled Gross Value Product (GVA) and 7.28 per cent to the agricultural GVA during 2019-20. There is a huge demand for Indian marine products across the world, during 2019-20 India earns about 46,600 crores by exporting 12.9 lakh metric tons of marine products [1]. This sector provides livelihood opportunities especially for the marginalized and vulnerable communities, 28 million people were earning sustainable income from this sector by involving in various activities such as, fish producing, catching, marketing activities etc.,

Fish is an aquatic animal reared in both marine and fresh water. Fishery is an important source of food, income, nutrition and livelihood for millions of people around the world. Fish plays a major role in human diet as they are rich in omega-3 fatty acids, amino acids, vitamins and trace elements. Consumption of fish provides many health benefits such as increase in intelligence, healthy development of brain tissues and retina in children; lowers blood pressure, reduces blood clots, lowers blood fats and increases good cholesterol; at the time of pregnancy it reduce the risk of delivering premature baby, increase breast milk and strengthens the bones of mother [2].

Fish and fishery products are one of the most significant sources to meet sufficient animal based protein. There is a noticeable gap between developed and developing countries in terms of fish consumption. The annual per-capita consumption in developed countries is about 23.3 kg, whereas it is 14 kg in developing countries [3]. Over the last couple of decades fishery product consumption has seen an increasing trend in India and in many developing countries due to disposable income rising, urbanization and health concerns. Fish consumption in a country depends on many factors such as increasing population along with a sufficient supply of fish and fish products, demand, income, education level, consumer preferences and fish prices, each one of the factors impacts fish consumption.

With this backdrop, the present research study conducted to analyse (i) consumer behavior towards the consumption of fish (ii) factors influencing consumption behavior of the fish consumers in the selected districts of North Karnataka.

## **MATERIAL AND METHODS**

### **2.1 Study area and Sampling framework**

The present study was conducted in Dharwad and Belgaum districts of North Karnataka, India. The multistage random sampling technique was employed. In the first stage, by considering the growth, popularity and market potential of fish, Dharwad and Belgaum districts of North Karnataka was selected. In the second stage, out of five taluks in Dharwad district, three taluks (Dharwad, Hubli and Navalgund) and out of ten taluks in Belgaum district, three taluks (Belgaum, Chikkodi and Gokak) were selected purposively. In this third stage, from each taluk one fish market selected and in fourth stage ten fish consumers from each market were selected randomly, thus making up total sample size of 60. The study was purely based on primary data; required information on socio-economic characteristics, consumer preference, consumer behavior etc., was collected through personal interview method from fish consumers with the help of well-structured and pre-tested interview schedule exclusively designed for the study.

### **2.2 Analytical tools**

Simple statistical tools like frequency, percentage and mean were used to analyze consumer profile (age, family size, sex, education and income) including the nature of consumer's interest and buying behavior. To study the factors influencing the consumption of fish in the study area, Multiple Linear Regression analysis (MLR) was carried out, with quantity of fish consumption as the dependent variable. The form of the function used was as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + u$$

Where,

Y= Consumption of fish (Kg /month)

a=Intercept

X<sub>1</sub> = Family income (Rs. /month)

X<sub>2</sub> = Expenditure on food products (Rs. /month)

X<sub>3</sub> = Average age of the family members (No.)

X<sub>4</sub> = Family size (No.)

X<sub>5</sub> = Price of fish (Rs./Kg)

X<sub>6</sub> = Family food habit Dummy (1=non-vegetarian household, 0=vegetarian household)

X<sub>7</sub> = Education (0= illiterate, 1=primary, 2=High school, 3=college, 4=Graduation)

X<sub>8</sub> = Price of the fish in market

u = Random disturbance term

“a” and “bi (i=0...7)” are the parameters to be estimated

The parameters were estimated by using ordinary least squares (OLS) technique. The obtained parameters were estimated and tested for its significance with 't' statistics.

## **RESULTS AND DISCUSSION**

### **3.1 Socio-economic profile of sample respondents**

The socio-economic indicators like gender, age, education, family size, family annual income, family type and occupation were studied for in-depth analysis of socio economic status of fish consumers in Dharwad and Belgaum districts. The results are presented in Table 1. Pooled, it was found that majority (65 %) of the consumers were in the age group of 20 to 40 years, followed by 40 to 60 years (23 %), more than 60 years (10 %) and around 1 per cent were belongs to less than 20 years. Among the total sample respondents 85 per cent were male and 15 per cent were female. This indicates less participation of female in fish purchase. The obtained results are in line with [4] where female participation in fish purchase was 13.13 per cent in Tripura. About 40 per cent of the respondents were graduates, 30 per

cent had attained education up to college (PUC), 15 per cent studied up to high school level, 10 per cent up to primary school and about 5 per cent were illiterate. Majority of the consumers (66 %) had a family size of 2-4 members, 26 per cent of consumers had 5-6 members in their family and about around 6 per cent of consumers had a family size of more than six members. Based on annual income, respondents were categorized into three income groups. The categories were; low income group (having annual income less than Rs. 50,000), medium income group (having annual income between Rs. 50,000 - 2,50,000) and high income group (having annual income more than Rs. 2,50,000). Majority of the

**Table 1. Socio-economic characteristics of the sample fish consumers in the selected districts of North Karnataka**

Particulars	Dharwad (n <sub>1</sub> =30)		Belgaum (n <sub>2</sub> =30)		Pooled (n=60)	
	Respondents (no.)	%	Respondents (no.)	%	Respondents (no.)	%
<b>Gender</b>						
Male	22	73.33	29	96.66	51	85.00
Female	8	26.67	1	03.34	9	15.00
<b>Age (years)</b>						
<20	0	0.00	1	03.37	1	01.66
20-40	19	63.33	20	66.66	39	65.00
40-60	9	30.00	5	16.64	14	23.33
>60	2	06.67	4	13.33	6	10.00
<b>Education</b>						
Illiterate	1	03.33	2	6.66	3	5.00
Primary	3	10.00	3	10.00	6	10.00
High school	4	13.33	5	16.66	9	15.00
College (PUC)	8	26.66	10	33.33	18	30.00
Graduation	14	46.66	10	33.33	24	40.00
<b>Family size (No.)</b>						
Small (2-4)	17	56.66	23	76.66	40	66.66
Medium (5-6)	11	36.66	5	16.66	16	26.67
Large (>6)	2	06.69	2	06.67	4	6.67
<b>Annual income (Rs.)</b>						
Low (<50,000)	5	16.66	2	6.66	7	11.66
Medium (50,000-2,50,000)	12	40.00	10	33.34	22	36.64
High(>2,50,000)	13	43.34	18	60.00	31	51.66
<b>Family type (No.)</b>						
Nuclear	26	86.66	28	93.33	54	90.00
Joint	4	13.34	2	06.67	6	10.00
<b>Occupation</b>						
Agriculture	1	03.33	0	0.00	1	01.63
Government Service	7	23.33	11	36.66	18	30.00
Business	19	63.34	17	56.65	36	60.00
Labour	3	10.00	2	06.69	5	08.37

Respondents (51 %) were under high income group followed by medium income group (36 %) and low income group (11 %). With respect to the occupational structure, large proportion (60 %) of sample consumers were involved in business activities, 30 per cent were working in Government sector, around 8 per cent were labourers and only 2 per cent involved in agricultural activity.

### 3.2 Frequency and volume of purchase of fish

The frequency and volume of purchase of fish by consumers is presented in Table 2. Pooled, it was found that 30 per cent of respondents visit occasionally, 26 per cent visit once in a month, 16 per cent visit once in week, 15 per cent visit twice in a week, 10 per cent visit fortnightly and around 1 per cent of them visit daily. In Dharwad district, it was observed that most of the consumers 12 (40 %) visit fish market occasionally, while 30 per cent of consumer visit once in a month [5,6]. As regards quantity of purchase

**Table 2. Frequency and volume of fish purchase by sample consumers**

Particulars	Dharwad district (n <sub>1</sub> =30)		Belgaum district (n <sub>2</sub> =30)		Pooled (n=60)	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
<b>Frequency of visit</b>						
Daily	1	3.33	0	0.00	1	1.66
Once in a week	3	10.00	7	23.33	10	16.66
Twice in a week	4	13.33	5	16.66	9	15.00
Fortnightly	3	10.00	3	10.00	6	10.00
Once in a month	7	23.33	9	30.00	16	26.66
Occasionally	12	40.00	6	20.00	18	30.00
<b>Volume of purchase (Kg/visit)</b>						
0.5-1	16	53.33	4	13.33	20	33.33
1-2	8	26.66	10	33.33	18	30.00
2-3	4	13.33	8	26.66	12	20.00
>3	2	6.66	8	26.66	10	16.66

per visit, Pooled, in both the districts the results indicates that 33 per cent of respondents were purchase 0.5 to 1 kg per visit, 30 per cent were purchase 1 to 2 kg per visit, only 20 per cent of consumers purchase 2 to 3 kg per visit and around 16 per cent purchase more than 3 kg per visit. It is clear that majority of the consumers (53 %) prefer to purchase 0.5 to 1 kg of fish per visit in Dharwad. However one third of the respondents in Belgaum prefer to buy 1 to 2 kg per visit. Table 3 depicts that, in pooled it was observed that, majority of sample fish consumers (66 %) prefer to buy the fish in cut pieces, while 33 per cent wishes to buy whole fish. About 66 per cent and 73 per cent of fish consumer in Dharwad and Belgaum district would prefer to buy in cut fishes. It is important to note here that, preferred type is depends on the dishes consumer would like to prepare [7].

### 3.3 Purchasing behavior of the consumer

Fish can be consumed in fresh as well as processed fish such as frozen fish, salted and dry fish etc.. Consumers' preference towards form of purchase revealed that, 68 per cent of consumers in the study region (pooled) preferred to purchase fish in fresh form, 18 per cent purchase frozen fish and only 13 per cent purchase salted and dry fishes. Maximum consumers (75 %) in both the districts were more emphasize to freshness of fish than processed form. It may be due that majority of the consumers were from high income family group and they accorded freshness. The obtained are similar with [8].

The assessment of consumers' preferences towards different pricing of fishes revealed that majority of the respondents (63 %) were willing to pay Rs.100-200 per kg, while 11 per cent were ready to pay Rs.200-500 per kg and 25.00 per cent of the respondents were comfortable to pay Rs. >500 per kg. As regards different districts, most of the farmers in Dharwad (70 %) and Belgaum district (56 %) were prefer to pay Rs. 100-200/kg [9,10]. It is clear from Table 3 that most of the consumers in the study area prefer to pay Rs.100-200/kg this is mainly because of the fish variety as majority of consumer prefer Banguda and its price ranges between Rs.140-180/kg and also consumers were ready to pay more than Rs. 500/kg) for rare and more demanded varieties like Pomfert and Surmai.

**Table 3. Purchasing behaviour fish by the sample consumers**

Particulars	Dharwad district (n <sub>1</sub> =30)		Belgaum district (n <sub>2</sub> =30)		Pooled (n=60)	
	Frequency	%	Frequency	%	Frequency	%
<b>Preferred type</b>						
Whole fish	11	36.66	8	26.66	20	33.33
Cut pieces	19	63.33	22	73.33	40	66.67
<b>Form of purchase</b>						
Fresh fish	23	76.66	23	76.66	41	68.33
Frozen fish	5	16.66	5	16.66	11	18.33
Salted & Dry	2	6.66	2	6.66	8	13.33

fish		Preferred price (Rs/kg)				
100-200	21	70.00	17	56.66	38	63.33
200-500	4	13.33	3	10.00	7	11.66
>500	5	13.67	10	16.67	15	25.00

### 3.4 Socio-economic factors influencing fish consumption behaviour

The multiple linear regression model was employed to study the various socio-economic factors influencing the quantity of fish consumption. Quantity of fish consumption was taken as explained/dependent variable (Y). The explanatory/independent variables considered to influence quantity of consumption were family income ( $X_1$ ), expenditure on food products ( $X_2$ ), age ( $X_3$ ), family size ( $X_4$ ), price of fish ( $X_5$ ), family food habit ( $X_6$ ) and education ( $X_7$ ). The results of this model were presented in Table 4. The family size exerted positive and significant influence on quantity of fish consumption in the Dharwad (0.535), Belgaum (0.634) and Pooled (0.598). It was indicated that, with each person addition of a new family member to the family was increase quantity of fish consumption by about 0.53 kg in Dharwad, 0.63kg in Belgaum district and pooled 0.59kg. Similar results were accordance with [11]. The family income was found to have positive and significant influence on quantity of fish consumption in Dharwad and Belgaum districts. It was observed that, for one unit increase in the family income the quantity of fish consumption was increases by 0.02kg in Dharwad district and 0.15kg in Belgaum district and pooled, 0.13 kg. Similarly, average age of the household was found to have positive and significant influence in Dharwad and Belgaum districts. It showed that, for every one year increase in

**Table 4: Socio-economic factors influencing the consumption of fish and fish products**

Sl. No.	Particulars	Dharwad district (n <sub>1</sub> =30)	Belgaum district (n <sub>2</sub> =30)	Pooled (n=60)
1	Intercept	0.674	0.032	0.389
2	Family income	0.021* (0.001)	0.153* (0.001)	0.131** (0.001)
3	Expenditure on food products	0.144 (0.001)	0.244 (0.001)	0.197 (0.001)
4	Age	0.144** (0.008)	0.197* (0.007)	0.168** (0.006)
5	Family Size	0.535** (0.082)	0.634** (0.067)	0.598** (0.054)
6	Price of fish	-0.106 (0.001)	-0.168 (0.001)	-0.136 (0.001)
7	Family habit (dummy)	-0.227 (0.220)	0.128 (0.180)	-0.107 (0.143)
8	Education	-0.174 (0.094)	0.091 (0.080)	-0.177 (0.060)
9	Price of fish	-0.103 (0.029)	0.373 (0.300)	0.101 (0.058)
11	R <sup>2</sup>	0.546	0.61	0.494
12	Adjusted R <sup>2</sup>	0.471	0.547	0.455

Note 1: Figures in the parenthesis represents standard error  
2: \*\* Significance at 5% level, \* Significance at 1% level

the average age of the household, the quantity of fish consumption was increased by 0.14kg in Dharwad district, 0.20kg in Belgaum district and pooled 0.17kg. However, price of fish showed negative and significant influence on quantity of fish consumption in Dharwad district. It showed that, every rupee increase in price of fish was decreases the quantity of fish consumption by 0.10kg in Dharwad district. Rest of the variables was non-significant [12, 13]. The co-efficient of multiple determination (R<sup>2</sup>) for factors influencing fish consumption behavior of the consumer in Dharwad, Belgaum district and pooled

0.47, 0.54 and 0.45 indicating that the variables in the model explained about 47, 54 and 45 per cent of the total variation.

#### 4. CONCLUSION

Fish and fishery products are great sources of omega-3 fatty acids and vitamins such as D and B<sub>2</sub> (riboflavin). By considering the health benefits of fish the present study analysed consumer behavior and factors influencing consumer behavior towards consumption of fish in Dharwad and Belgaum districts of North Karnataka. The study has pointed out that most of the consumers consume fish occasionally and purchase 0.5-1.0 kg per visit. The majority of the consumer preferred fish to a great extent in fresh condition in the form of cut pieces. The majority of the consumers were comfortable to pay Rs.100-200/kg [14, 15]. The study also revealed that family size is positive and significantly influences the consumption behavior of the consumer, indicating more the family size more the consumption of fish. Hence, by considering the health benefits, it is recommended to promote the consumption of fish by the concerned departments.

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