



Importance of Fish for Human Welfare and Socio-Economic Status of Fish Consumers of Dumka (Jharkhand)

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Fish contains most of the nutrients required for human health. The fishes are used for the remedy of some acute diseases such as asthma, dysentery, eye diseases, ring worm etc. Fish is an excellent source of protein, n-3 polyunsaturated fatty acids, vitamins and minerals, which are very less in vegetable products and other non-vegetable products. The auspicious value of fish is important since early age.

The study of socio-economic status of fish consumers of Dumka (Jharkhand) indicated that maximum (44.66%) fish consumers were in service (government or private) followed by business (27.33%) in all the three income groups. More than 75% of fish consumers were Hindus followed by Muslims (12.66%). The maximum fish consumers belonged to general caste followed by scheduled tribes (22.66%). About 53.00% fish consumers of higher income group consumed fish more often than the lower income groups and only 5.33% fish consumers had no knowledge about the freshness of fish. Among fish species Rohu (Labeo rohita) was the most preferred followed by Catla (Catla catla). Fish curry was the most preferred fish form.

The findings clearly reflected the lack of awareness among fish consumers about its different forms such as stuffed, pickled and canned forms. Along with the importance of fish for human welfare the present manuscript also clearly showed direct relationship between income of the fish consumer and their fish consumption pattern.

Key Woards: Fish consumers, Socio-economic status, Human Welfare, Dumka

Introduction

Fish enjoys a very special consideration and place in human civilization from early period. The fish, one of the first forms of evolutionarily higher life to appear in water is among the earliest vertebrate. It was, therefore, regarded as one of the treasures of water. Motifs and symbols that appeared in early Indian art, particularly, the ones derived from water cosmology, depict the fish as beautiful and attractive. The nutritive and medicinal value of fish has been recognized from time immemorial. Fresh fish flesh is an excellent source of proteins for human diet. (Kumar and Mishra, 2001) Traditionally, the fish is considered as the, "protein for poor". Some fishes are traditionally used for curing a few human diseases. Therefore, the fish must be considered as integral part of over all development of human health and wealth. The importance of fish for human cannot be neglected. Its food value, gastronomic, culinary and nutritional importance, brings it to fore.

Dumka district has vast water resources in the form of rivers, ponds and reservoirs. The study was undertaken with the objectives of understanding the socio-economic status and consumption behaviour of fish consumers of Dumka township.

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Methodology

The consumption pattern of fish consumers in Dumka was studied by randomly selecting 150 respondents (fish consumers) which included different socio-economic groups of the society, i.e. high (>7,500 Rs.), middle (2500-7,500 Rs.) and low income (<2500 Rs.) groups based on monthly income. A questionnaire was specifically designed for the purpose and personal interview method was followed to collect the information regarding the consumption pattern of fish consumers and their socio-economic status, viz occupational, age, religion, caste, literacy and family size in the Dumka town during the year 2010-2011.

Importance of Fish for Human Welfare

Fish is known from ancient time as a source for human nutrition and symbol of prosperity. The importance of fish was also in early era in religious activities. Symbols like two fish Swastika and Srivatsa are auspicious. The double fish connected by a cord held in the mouth of each, occurs frequently. Meenakshi (fish-eye) is a popular epithet used to describe a woman with beautiful eyes. An ear pendent from Taxila is a classic example of the fish motif to establish jewellery. Three fish with a common head occurs in several countries of Asia, Africa and Europe where it was accepted as a symbol of fertility. The representational continuity of the fish in India is traceable from the pottery of Nal and the Indus civilization. The knowledge about the occurrence of fish in India dates back to three millennium B.C. Fish remains with cut marks, indicative of their use, have been obtained from excavations at Mohanjodero and Harappa of Indus valley civilization. (Singh and Radheshyam, 2000)

Fish is a rich source of most of the essential nutrients. (Kumar and Mishra, 2001) The fish protein is relatively of high digestibility, biological and growth promoting value for human consumption. Nutritional studies have proved the fish proteins rank in the same class as chicken protein and are superior to milk, beef protein and egg albumen. Fish proteins comprise all the essential amino acids in desirable amount for human consumption, namely, lysine (high concentration), arginine, histidine, leucine, isoleucine, valine, threonine, phenylalanine and tryptophan. Fish is an abundant source of long chain of n-3 Poly Unsaturated Fatty Acids (PUFA) that decrease fibrinogen levels and inhibits the activities of platelets and clotting the process. The essential micro-nutrients and minerals in fish, which are deficient in staples, include vitamins A & D, phosphorous, iron, calcium, magnesium, selenium and iodine. Fish is a source of high quality animal protein supplying approximately 6% of the world's protein requirements and 16% of total animal protein. Among the essential fatty acids, Eicoso-pentenoic acid (EPA) is required for normal functioning of the vascular system and Docoso-Hexenoic Acid (DHA) for the formation of the brain and nervous system, which are laid down during fetal growth. Fish flesh therefore becomes a valuable supplement to human diet for people who are habitually taking cereals, starchy vegetables and sugar as their principal diet. Over and above all, fish flesh also offers a palatable taste and flavours, and is easily digestible.

From the early age fish is used for the treatment of some human diseases such as asthma, ringworm, eye diseases, etc. By the eating of magur (*Clarius batracus*), singhi (*Heteropneustes fossilis*) and kawai (*Anabus testudinus*) just after curing from dysentery is effective for human health. The blood circulation becomes proper by taking Potihee sidheri (*Puntius* sps), chelwa (*Chella* spc.) and Chanda chanri (*Chanda* sps.). The roasted Potihee cures asthma disease and the ash of the same fish helps in curing ringworm. Molluscan

meat have high protein value (Kumar and Kumar, 2002) and the persons who are taking snail never suffer from asthma. Wearing by necklace of the rohu teeth cures the roha eye disease. The white skin disease of human being will disappear by taking fish just after eating milk products. (Mishra and Sharma, 2004)

With the increased stress and strain in modern life incidence of cardio vascular problems and carcinogenesis are posing problems and sizeable sections of susceptible urban population. Thus, low value fishes are fast becoming raw material for making high value nutritional supplements of beneficial pharmaceutical properties (Devdasan, 2001). The PUFA of fish oils are good remedies for solving cardio-vascular problems. They are known to reduce serum cholesterol levels and also to prevent excessive platelet aggregation. Liver oils of fish, particularly shark and cod are good source of vitamins A & D. However, liver oil of some deep-sea sharks are now highly valued for their squalene content. Squalene is a highly unsaturated aliphatic hydrocarbon ($C_{30}H_{50}$). It is precursor of cholesterol and plays an important role in embryological development. It also acts as an immuno protector and exhibits curative effect on colon cancer. The squalene is found useful in the treatment of dietary hypercholesterolemia also. The collagens collected from skin and air bladder of fish find useful in dentistry and as artificial skin. Chitosan impregnated collagen films are effective in preventing blood loss and also infection when used as artificial skin. Fish guts yield suture, which are used for microsurgeries and ophthalmic surgeries. Calcium powder processed from the backbone of tuna can be used to combat calcium deficiency in children, which can lead to bone failure and spine curvature. Beche-de-mer produced from holothurians (sea cucumbers), known for its therapeutic value in the treatment of high blood pressure. Ambergris, which is produced from whales are widely used in the orient as an aphrodisiac. (Mukhopadhyaya, . 2001)

Socio-Economic Status of Fish Consumers of Dumka

The information regarding the socio-economic status of fish consumers of Dumka viz. occupation, age, religion, caste, literacy and family size was gathered to study socio-economic status of respondents.

The data presented in Table-1 showed that maximum (44.66%) fish consumers were in service (government or private) followed by business (27.33%). Only a few respondents are belong to higher income group was engaged in farming occupation. Maximum (57.33%) respondents were in the age group of 35-55 years in all the three income groups. Seventy six per cent fish consumers were Hindus followed by Muslims (12.66%).

Majority of fish consumers (46.00%) belonged to general caste followed by scheduled tribes (22.66%), OBC (16.00%) and scheduled castes (15.33%). The literacy level (graduate and above) was highest in higher income group (55.00%) followed by middle (46.00%), while, no respondent was found to be graduate and above in lower income group. Also, no respondent in higher income group was found to be illiterate as against 4.0% in middle and 35.00% in lower income group. About fifty two per cent fish consumers had large family (>5 members) and 47.33% had small family (up to 5 members).

Frequency of Fish Consumption

The data presented in Table-2 clearly showed that most of the consumers (47.33%) preferred weekly consumption of fish followed by fortnightly (24.66%), monthly (23.33%) and daily

Table : 1
Socio-Economic Status of Fish Consumers of Dumka

Personal Attributes	Category	Income group (Rs./month)			Total	Distribution in %
		High >7500	Middle 2500-7500	Low <2500		
Occupation	Service	32	28	7	67	44.6
	Business	19	17	5	41	27.33
	Labour	—	—	32	32	21.33
	Farming	—	5	5	10	6.66
Age	< 35 years	9	6	18	33	22.00
	35-55 years	31	28	27	86	57.33
	> 55 years	10	16	5	31	20.66
Religion	Hindu	40	32	42	114	76.00
	Muslim	3	9	7	19	12.66
	Christian	4	3	2	9	6.00
	Sikh	2	6	—	8	5.33
Caste	General	31	24	14	69	46.00
	OBC	8	8	8	24	16.00
	SC	5	8	10	23	15.33
	ST	6	10	18	34	22.66
Literacy	Graduate & Above	20	17	—	37	24.66
	Middle	8	7	12	27	18.00
	Primary	6	4	17	27	18.00
	Illiterate	—	8	51	59	39.33
Family Size	Small (up to 5 members)	29	26	16	71	47.33
	Large (more than 5 members)	20	24	35	79	52.66

(4.66%). Also, the economic status of consumers had a significant effect on the frequency of fish consumption as the consumers in higher and middle income groups were found to consume fish more often and frequently than the lower income group. The higher income and education level coupled with health concerns and convenience could be the most suitable reasons for this pattern as also reported by (Gao & Thomas, 1994; Wilkie *et al.*, 2005; Sharma & Khajuria, 2009 and Poddar *et al.*, 2011). It was interesting to find that a small decrease in the price of meat of other domesticated animals lead a decline in the consumption of fish as also observed by Wilkie and Godoy (2001) and Sharma & Khajuria (2009). These findings reflected higher expenditure elasticity for meat, fish and egg (animal protein) as compared to cereals and pulses and showed significant effect of income and other socio-economic variables on fish consumption as reported by Aubert (2004).

Table : 2
Distribution of Respondents According to Frequency of Consumption

Income Group	Monthly	Frequency of consumption			Total
		Fortnightly	Weekly	Daily	
High	9	12	25	4	50
Middle	10	7	30	3	50
Low	16	18	16	—	50
Total	35 (23.33)	37 (24.66)	71 (47.33)	7 (4.66)	150 (100)

Preference on the basis of Weight of Fishes

The data regarding the preference for weight ranged from 500-1000g followed by 250-500g (Table-3). Only 7.33% fish consumers preferred weight range above 1000g and 16% above 250g. Thus, if a fish is harvested within the above weight range, it would fetch good preference in the market. (Choudhary, 1976)

Table : 3
Distribution of Respondents According to the Weight of Fish Preferred

Income Group	Weight of fish preferred				Total
	< 250g	250-500g	500-1000g	>1000g	
High	—	15	32	3	50
Middle	5	19	22	4	50
Low	19	19	8	4	50
Total	24 (16)	50 (33.33)	62 (41.33)	11 (7.33)	150 (100)

Preference on the basis of Types of Fishes

The data on the type of fish preferred is given in Table-4. The native Indian major carps were in great demand as compared to all other varieties. Among IMCs, rohu and catla were greatly liked by the consumers' inspite of their higher prices owing to their nutritive value and taste as also observed by Pandey *et al.* (2001), Sharma & Khajuria (2009) and Poddar *et al.*, (2011). Catfish was preferred by only 8.66% consumers, while less than 3.0% preferred murrels, mrigal and calbasu (Rao and Prasad, 1978).

Religious belief and ethnical differences also explained variations in the fish consumption pattern. For instance, Muslim communities have strong preferences for Andhra fishes (Exported preserved fishes) whereas, Hindu preferred native freshwater fishes and only tribals preferred small sized weed fishes of low prices.

Table : 4
Distribution of Respondents According to the Type of Fish Preferred

Income Group	Type of fish preferred							Total
	Rohu	Catla	Mrigal	Calbasu	Catfish	Murrels	Others	
High	14	16	—	—	4	4	12	50
Middle	22	16	—	—	2	—	10	50
Low	12	10	2	1	7	—	18	50
Total (%)	48	41	2	1	13	4	41	150
	(32.00)	(27.33)	(1.33)	(0.66)	(8.66)	(2.66)	(27.33)	(100)

Preference on the Basis of Forms of Fishes

The data regarding form of fish consumed showed that highest number of consumers (67.33%) preferred fish curry followed by fried (24.66%), pickles (6.00%), canned (1.33%) and stuffed (0.66%) forms (Table-5). No fish consumer in lower income group opted for stuffed, pickled and canned forms of fish. This clearly reflected the lack of awareness about its different forms among fish consumers in the study area. Therefore, value addition of fish is recommended to suit the changing needs and tastes of consumers and also creating awareness about the different fish forms e.g. fish sauce, papad, chutney, caviar,

surimi and emulsion products etc. These findings were in congruence with the findings of Iyer (1998), Sharma *et al* (2005), Sharma & Khajuria (2009) and Poddar *et al.*, (2011).

Table : 5
Distribution of Respondents According to the Form of Fish Consumed

Income Group	Form of fish consumed					Total
	Fried	Curry	Stuffed	Pickles	Canned	
High	8	34	1	4	2	50
Middle	11	34	—	5	—	50
Low	17	33	—	—	—	50
Total(%)	37(24.66)	101 (67.33)	1(0.66)	9(6.00)	2(1.33)	150(100)

Awareness about Freshness of Fish among Fish Consumers

The data regarding the knowledge about the freshness of fish showed that only 5.33% fish consumers had no knowledge about the freshness of fish, whereas, 98.0% consumers in lower income group were found to have good knowledge about the freshness followed by middle (96.00%) and higher (90.00%) income groups. Maximum (57.33%) consumers went for gill's condition as their criterion for freshness of fish followed by 28.00% consumers for eyes and only 9.33% consumers opted for organoleptic characters. Thus, it could be said that most of the fish consumers in Dumka town appreciated quality in contrary to the existing view about the ignorance among fish consumers (Masette *et al.*, 1998; Lie, 2001 and Poddar *et al.*, 2011). Also, the lower income group consumers had shown more ability for quality perception.

Table : 6
Distribution of Respondents According to the Knowledge About Freshness of Fish

Income Group	Knowledge about freshness				Total
	If yes, then			No	
	Gills	Eyes	Organoleptic characters		
High	29	11	5	5	50
Middle	25	19	4	2	50
Low	32	12	5	1	50
Total(%)	86(57.3)	42(28.00)	14(9.33)	8 (5.33)	150(100)

Majority of fish consumers purchased fish directly from the fish market in fresh form. The second most viable alternative was the local fish booth in the vicinity of fish consumers. Only few consumers bought fish from the landing centres. Similar observations were made by Honkanen *et al*, (1999), Sharma & Khajuria (2009) and Poddar *et al.*, (2011).

Conclusion

The above facts proved that fish is extremely valuable for human beings. Fish proteins contains high valuable protein compared to all other animal meat; moreover, fish protein is accompanied by very little calorie, making it an ideal complementary food along with cereals and vegetables. Fish contains much less connective tissue making it easily digestible and nutritionally superior. It is rich in n-3 fatty acid, which gives to fish an incomparable nutritional merit over all other animal meats. Fish flesh is an excellent source of vitamins

like A, D, E, K and B₁₂ besides being rich in calcium, iron, phosphorous and iodine. These nutrients help in curing many acute diseases of man. There is, urgent need for the development of fish farming and their proper distribution to supply sufficient amount of fish to the poor people of both urban and rural areas for their health.

On the other hand, it is evident that the income of fish consumers had a direct effect on their fish consumption behaviour. But the proportion of food budget allocated to fish expenditure was higher among lower income group people. Rohu topped the list, in the order of preference. Religious belief and ethnical difference also explained variations in the fish consumption pattern. Also, value addition of fish is recommended to suit the changing needs and taste of consumers and also creating awareness about different fish forms e.g., fish sauce, papad, chutney, noodles, caviar, surimi and emulsion products etc., that have evolved in the world fish market. Due to non-adoption of suitable fish preservation technologies, the quality of fish reaching the consumers deteriorates. Thus, for maintaining proper quality of fish, it is necessary to adopt standard processing and preservation technologies for maintaining the high quality of fish for ultimate consumers.

Therefore, fish farming community can be appropriately tuned to respond to the needs of consumers. Some of the strategies that can be utilized for the changing needs and tastes of fish consumers are (i) creation of more awareness about different fish forms, (ii) emphasis on research and extension efforts, (iii) food regulation, (iv) good brand and packaging concepts, (v) organized retailing, and (vi) encouragement of feedback flow of information from the consumers.

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