



# Study of Factors Influencing Fish Consumption Pattern in Punjab (India)

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**Abstract:** The present study aims to assess the fish consumption patterns and consumer preferences towards fish and fish-products in Punjab. The study was carried out in Punjab through a structured questionnaire to collect information about fish consumption patterns during 2021-22. A Google form created in English and Punjabi was circulated through e-mails, WhatsApp groups and various other social media platforms. The, total of 636 responses were recorded from rural (53%) and urban areas (47%) which revealed that 42.8% respondents were fish eaters while rest 57.2% as non-fish eaters. The major reason behind less consumption of fish and fish-products in Punjab was due to religious constraints (62.9 % of the non-fish eaters), followed by fishy flavour and odour (15.7%) and presence of spines (1.1%). Moreover, people have good knowledge about the facts of quality, spoilage, health benefits of fish but only 26.8% of fish eaters consider nutritional value of fish as selection criteria. Therefore, the findings of the present study signify the need to promote consumption of cheaper and easily digestible protein rich fish meat as well as to create awareness about nutritional benefits of eating fish in Punjab.

**Keywords:** Constraints, Fish consumption, Health benefits, Pattern, Punjab

Fisheries is the fastest growing animal food sector and it bridges the gap between the immensely increasing human population and nutritional security. Significant benefaction of fisheries sector is much clear and efficient towards the global hunger fight, achieve food security, and enhance nutrition as visualized in UN 2030 Agenda for Sustainable Development Goals (Bennet et al 2018). Fish is considered as the cheapest source of animal protein and along with that, fish flesh commonly known as white meat have edible taste and flavour. While considering the nutritive value, fish is relatively superior than other animal protein consumed by human beings, in respect to its protein content/quality, easy digestibility, omega-3 fatty acids, minerals and vitamins. Therefore, it is advocated that fish should be part of human diet for various health benefits such as for better eyesight, controlling cardiovascular diseases as well as healthy skin and hair.

Worldwide, consumption of aquatic foods has reached about 20.2 kg per capita in 2020-more than double of the average consumption as compared to that of 1960s (9.9 kg per capita). Rising incomes and urbanization, betterment in the post-harvest techniques and modifications in the dietary habits have resulted in the projection of consumption of aquatic food by 15% increase to supply on average 21.4 kg per capita by 2030 (FAO 2022). Fish consumption preferences vary with topographical conditions, region, community etc. In India, Tripura ranks first in consuming the

largest number of fish per capita (29 kg) annually (Deb 2021) whereas only 0.4 kg per capita in Punjab, despite of contributing a huge amount in the fish production (The Tribune 2022a). In Punjab, area of 43,691 acres is under fish farming, producing approximately 1,89,647 tonnes of fish but annual per capita fish consumption is very low, against the national per capita fish consumption (9 kg) (The Tribune 2022b). Keeping the above facts in view, an attempt was made to assess the factors influencing fish consumption patterns in Punjab.

## MATERIAL AND METHODS

The study was carried out in Punjab (India) through a structured questionnaire to collect information about fish consumption patterns in the state from 2021-22. A Google form was created in English as well as Punjabi and circulated through e-mails, WhatsApp groups and various other social media platforms. The questionnaire included the respondents' personal details and different parameters of fish consumption pattern. For non-fish eaters, the form ends with reasons for not consuming fish and fish products whereas for fish-eaters, it continues further with different parameters including selection criteria, frequency to consume fish, facts about the health benefits of eating fish and others. The total sample size for consumer survey was 636, including the respondents from urban and rural areas. The collected information was compiled in the form of

tabulating frequencies, percentages, and graphs (pie and bar graphs) for efficient representation and interpretation of data.

## RESULTS AND DISCUSSION

An online survey was conducted by using structured questionnaire to assess the fish consumption patterns as well as the factors influencing fish consumption in Punjab. Total 636 responses were recorded from both rural and urban areas with a contribution of 53 % and 47 %, respectively, covering 22 districts of Punjab with maximum responses recorded from Ludhiana (30.5%). Among the total respondents, 56.9 % were male whereas 43.1 % were female. Basic information of respondents was also collected with respect to different age groups, education, occupation, family size and income status (Table 1). Out of total 636 responses, 42.8% were fish eaters whereas 57.2% do not like to consume fish which might be attributed to the consumer preference for chicken, mutton, pork etc. by meat eaters in Punjab (less than 40%) and majority of the fish consumers have the preference of spineless fish flesh. From the survey, it was observed that people from Punjab prefer to eat spineless fishes (41.2%) like - *Wallago attu* (Malhi), *Sperata seenghala* (Seenghara) *Pangasius* (Pangas) etc., in the form of fresh fish (33.8%), fish products (20.2%) and both (46%). They usually prefer to eat fish-products also like fried fish/curry (80.9%), followed by fish cutlets, fish fingers, fish balls, fish pickle, and fish sausage. The frequency of eating fish/fish-products is comparatively lower in Punjab as majority of the respondents include the fish/fish products in their diet once in a month (fresh fish - 55.5% whereas canned, dried, and frozen fish – 60.3%). The lower frequency of eating fish in Punjab, is mainly due to religious constraints (62.9 % of the non-fish eaters), followed by fishy flavour and odour (15.7%), presence of intramuscular spines (1.1%), higher price (0.8%), less availability in the area (0.6%). The 76.6% of the total respondents became fish eaters from vegetarian which could be attributed to their educational status and knowledge about the nutritional benefits of eating fish/fish products. The reviewing the present results indicated people used to gain the knowledge about the benefits of eating fish through various sources like fisheries education (31.3%), book/newspaper (23.5%), social media (23.2%), radio/TV & others (22.1).

Fish consumption patterns revealed that people of Punjab usually prefer to eat fresh fish and select on the basis of parameters like nutritional value (60.7%), taste (37.5%), availability in local area (1.5%), and cheaper price (0.4%). Normally buy the fish from local market (75.4%), super market (19.9%) and fish landing centres (4.8%) and prefer to prepare fish/fish-products at home (62.5%). Whereas they

prefer to consume fish-products also and used to select fish-products over other animal meat products due to quality and taste (54.4%) followed by nutritional value (26.8%), availability in local area (15.1%) and affordable price (3.7%). People from Punjab are fond of eating spineless fishes (cat fishes like Malhi, Sanghara and Pangas) and do not prefer to eat carps due to presence of intramuscular spines. But carp culture is the backbone of aquaculture in the Punjab, producing a huge quantity of fish (1.51 lakh tonne during 2019-20), which is widely preferred by the migrants especially from Bihar, Uttar Pradesh, Andhra Pradesh, West Bengal, Madhya Pradesh, and others, as a constant food whereas only 25 % of native population (Punjabi) consumes fish, preferably as snacks (IWP 2016). The consumers (Punjabi population) attitude towards fish and fish-products were assessed and was observed that fish is easily available (109%), comparatively cheaper source of animal protein than others (79%) and good for human health (148%) (Fig. 1). The 62.9 % of the non-fish consumer respondents do not consume fish due to religious constraints. Fish consumption preferences vary with topographical conditions, region, community etc. Sabat et al (2008) reported that major problems in fish consumption were varying supply chain, less availability of fresh fish, high price, and presence of bones in

**Table 1.** Basic information about the respondents (N = 636)

Age group	18-30 years	56.3%
	30-50 years	34.1%
	50-70 years	8.5%
	>70 years	1.1%
Education status	Primary	4.6%
	High school	22.8%
	Graduation	44.3%
	Post-graduation	28.3%
Occupation	Fish farmer	3.8%
	Animal husbandry and agriculture	3 % and 10%
	Govt. and private job	14% and 14.2%
	Self-employed	14.9%
	Unemployed	13.8%
Family size (No.)	<4	26.3%
	4-8	69.3%
	>8	4.4%
	Income /month	<Rs. 25,000/-
	Rs. 25,000-50,000/-	32.1%
	Rs. 50,000-1,00,000/-	26.9%
	>Rs. 1,00,000/-	15.7%

fish meat in the northern India. The lack of awareness, lesser preference of fish meat over other animal protein and undeveloped taste of fish were the major constraints behind the lesser consumption of fish and its value-added products. Bhuyan et al (2017) revealed that among various reasons behind high consumption of fish in Assam were palatability of fish, higher nutritional content, and availability at cheaper price than other types of animal protein. Sanjeev et al (2021) reported that in Kerala, rate of consuming fish is very high in comparison to the national average whereas the fish consumption rate was far below than the Kerala figures in the tribes of Wayanad district, Kerala. Affordable price, local availability of preferred fish species were the major factors influencing the good procure amount and higher

consumption of fish in the tribe. Majagi and Somashekar (2020) observed that income plays an important role with respect to preference of fish species (price of fish) to buy for consumption. Rahman and Islam (2020) reported that lower fish consumption is majorly due to lower income levels, followed by high prices and lack of knowledge about nutritional value of fish among people of Bangladesh. Budhathoki et al (2022) observed that knowledge and attitude towards the quality and safe consumption of aquatic food is as major factor, whereas price plays a central role.

Therefore, based on results, culture, and production of spineless fish like Pangas should be promoted in Punjab, as 90% of the aquaculture production is dependent on carp culture which is less preferred for consumption in the state,

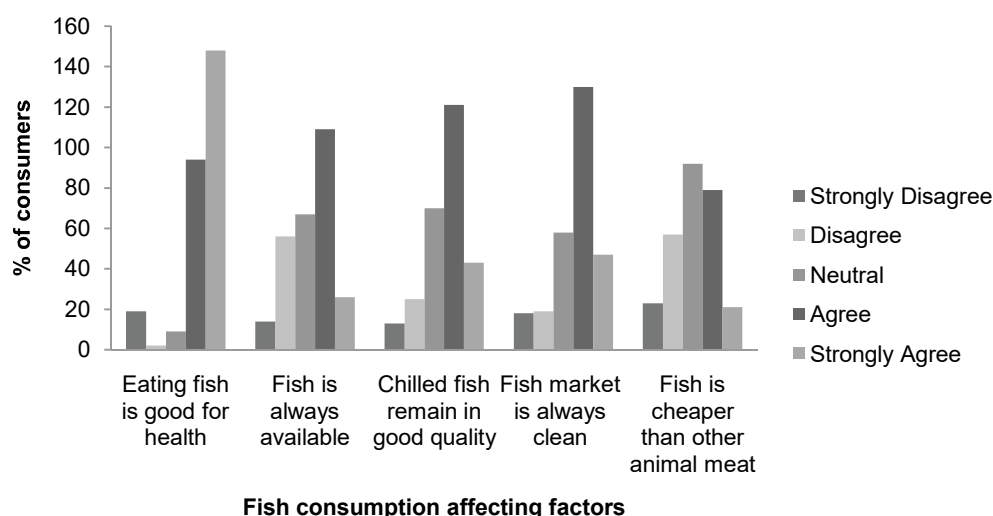


Fig. 1. Consumer's attitude towards eating fish and fish-products

Table 2. Major parameters showing fish consumption patterns in the Punjab

Parameter	Percent response
Preference of fish or fish products over other types of animal meat	Due to nutritional value (60.7%) Due to taste (37.5%)
Frequency of eating fresh or frozen fish	Once in a month (55.5% and 60.3%, respectively)
Frequency of eating fish products	
Form of fish consumption	Both fresh fish and fish products (46.0%)
Preferred fish-product	Fried fish (80.9%)
Criteria for selecting fish product	Quality and Taste (54.4%)
Preferred fish species	Cat fishes (41.2%)
Source of buying fish	Local market (75.4%) Super market (19.9%) Fish lending centres (4.8%)
Fish and fish-product prepared by consumers at home	Yes (62.5%) No (37.5%)
Any problem encountered with fish consumption	No (80.9%) Yes (9.2%) Not sure (9.9%)

**Table 3.** Knowledge of consumers about quality and nutritional value of fish

Parameter	Percent responses
Parameter to decide quality of fresh fish	<ul style="list-style-type: none"> <li>• Smell (28.3%)</li> <li>• Skin colour (22.8%)</li> <li>• Skin texture (15.1%)</li> <li>• Gill colour (8.5%)</li> <li>• All of the above (60.7%)</li> <li>• Don't know (11.4%)</li> </ul>
Fish as a good source of Omega-3	<ul style="list-style-type: none"> <li>• Yes (91.2%)</li> <li>• No (2.2%)</li> <li>• Not Sure (6.6%)</li> </ul>
Benefits of eating fish for human health	<ul style="list-style-type: none"> <li>• Yes (86.4%)</li> <li>• Not sure (13.6%)</li> </ul>
Reason for spoilage of fish	<ul style="list-style-type: none"> <li>• Temperature (12.1%)</li> <li>• Moisture (1.5%)</li> <li>• Microorganisms (18.4%)</li> <li>• All of the above (57.7%)</li> <li>• Don't know (10.3%)</li> </ul>

whereas Pangas is imported from other states (Andhra Pradesh and West Bengal) for sale in the Punjab.

### CONCLUSIONS

The present study assessed the factors influencing fish consumption patterns as well as consumer preferences towards fish and fish products in Punjab. The people of Punjab prefer spineless fish and fish-products depending upon their taste and quality. Lower frequency of fish consumption is recorded which is mainly due to religious constraints. The study indicated lower per capita fish consumption which further provokes the need to create awareness about the nutritional benefits of consuming fish and to promote fish consumption.

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