

Fish Consumption Pattern and Awareness about Health Benefits of Eating Fish among People of district Anantnag Kashmir

Bilal Ahmad Bhat¹, Sayima Majeed²

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Abstract

Fish, one of the most significant source of animal protein, is a major component of a balanced low-fat healthy diet, and it is a good source of a number of beneficial compounds. In particular, white fleshed fish, is lesser in fat than any other source of animal protein, and oily fish are high in omega-3 fatty acids, or the “good” fats. Fish are low in the “bad” fats usually found in red meat, called omega-6 fatty acids. The present study was carried out in Southern part of Kashmir in J&K region with the aim to access the consumer’s behavior towards fish consumption and awareness about the health benefits of eating fish. In this paper, stratified random sampling technique was adopted to collect the data from a sample of 400 respondents using well-designed validated questionnaire. The results of our study revealed that cultural, socioeconomic factors like financial status of people, education status of the family head, awareness about the health benefits of eating fish, cost and availability of fish in the market of Kashmir valley plays an important role in fish consumption among the people of district Anantnag of Kashmir valley. It was noticed that majority of the respondents understudy (27.0%) preferred Trout, 29.5% preferred Carp, 11.0 % preferred Schizothorax and 32.5% respondents had no specific choice. Further, group discussion with people involved in fisheries business revealed that 73.5% respondents believe that there is a great scope for fish farming in Kashmir valley. Finally, the researchers discussed the health benefits of eating fish and marketing problems of fish in Kashmir valley.

Keywords: Fish; Kashmir; Socio-economics; Consumer Preference; Statistics.

Introduction

Kashmir, also known as “paradise on earth,” is located at an elevation of more than 1,500 metres above sea level, surrounded on all sides by Himalayas, with the exception of an opening to the west created by the overflow of River Jhelum. The paleartic area surrounds Kashmir valley on the north-east and north-west, while the oriental zone surrounds it on the south, resulting in a mix of fauna from both regions in the valley. A number of fish species such as Schizothorax, Oreinus, Glyptothorax are characteristically paleartic elements which have reached Kashmir valley across the Himalayas.

The major component ichthyofauna of Kashmir is represented mainly by the Central Asiatic fauna dominated by Schizothorax group (Sunder et al., 1979). Fishes belonging to families Cyprinidae, Cobitidae, Siluridae, Poeciliidae, Sisoridae and Salmonidae are found in the valley (Yousuf, 1996, Balkhi, 2005). According to Heckel (1838), no fish of Indian plains could reach the Kashmir region since they have to cross through 30-miles of rapids and rocky gorges and thus explained the conclusion that the fishes of Kashmir valley from the rest of India are totally different. The common carp (Cyprinus carpio) is one of the world’s most invasive fish

Author’s Affiliation: ¹Head, Division of Social Science, ²Ph.D Scholer, Faculty of Fisheries, Sher-e-Kashmir University of Agricultural Sciences and Technology, Jammu and Kashmir 191121, India.

Corresponding Author: Bilal Ahmad Bhat, Head, Division of Social Science, Faculty of Fisheries, Sher-e-Kashmir University of Agricultural Sciences and Technology, Jammu and Kashmir 191121, India.

E-mail: bhat_bilal@rediffmail.com

(Kulhanek et al., 2011) which was brought to India in 1939 from Srilanka and introduced into the Nilgiris. In Kashmir valley it was introduced in 1956 and since then this fish has shown remarkable adaptation in various water bodies of the region, and soon began to constitute a major fishery of flat land temperate waters of Kashmir (Fotedar and Qadri, 1974). It is a fast growing and hardy fish that can withstand adverse environmental conditions, and it has been successfully introduced into fresh waters throughout the world (Seegers et al., 2003; Golemi et al., 2013).

The present study was conducted in Anantnag district of Jammu and Kashmir. Anantnag District is in southern area of Jehlum Valley. Geographically the region lies between 330-20' to 340-15' north and 740-30' to 750-35' east longitude. The Southern area of the region, which is bordering with tehsils of Reasi, Banihal and Kishtwar of Jammu region, and Eastern area which is coterminous with tehsil Kargil of Ladakh division includes thick forests and mountains. The Northern and Western sides of this district is bounded by Pulwama while Kulgam region falls in its west.

Among all the districts, Anantnag claims the biggest number of streams (Nallas) like Sandran, Brengi, Arpath and Lidder. Lidder, being the most important, takes off from Sheshnag lake and irrigates maximum part of the region. The total area of the district is 3574 sq.km (Census 2011) with 395 villages and 10 Tehsils. The population of the district is 1078692, with 559767 male and 518925 female. District Anantnag is bestowed with vast expanses of water resources spreading over an area of 0.40 lac hectares in the form of rivers, lakes, streams, ponds, pools, spring etc. owing to such large water resources, the district forms prime centers of cold-water fisheries especially trout, earning Anantnag the tag of "Trout District" of the country.

In many developing countries, fish forms the major portion of animal protein in human diets. Fish being a rich source of various nutrients, including protein and long chain omega-3 polyunsaturated fatty acids and micronutrients plays a key role in balanced, healthy diet and has a lot of health benefits including anti-oxidation, anti-inflammation, wound healing, improving memory, cardio-protection, and skin protection. Fish is an excellent source of protein, with 18-20% protein on fresh dry weight basis. Fish contains all essential amino-acids, including Lysine, Methionine, and Cystine and plays an important role in growth, maintenance and repair of body tissue as well as providing energy. Cardiovascular disease is one of the

leading causes of death worldwide. Heart attacks, coronary artery disease, and other cardiovascular diseases are becoming more common. The presence of long-chain n-3 fatty acids, docosahexaenoic acid (DHA), and eicosapentaenoic acid (EPA) in fish and fish oils is known to have coronary health benefits. Fish oils were discovered to have a therapeutic effect in reducing atherosclerotic lesions (wang et al., 2004), and omega-3-long chain polyunsaturated fatty acids from fish oils can improve suboptimal cardiovascular risk (Zeng et al 2017). Asthma and other respiratory diseases are also common in today's world, and fish consumption can help to reduce their occurrences.

Eating fish such as salmon, trout, and sardines as part of a healthy diet can help children with asthma. Further more, fish aids in the treatment of depression, which is a serious problem. According to studies, people who eat fish on a regular basis are much less likely to develop depression (Grosso et al. 2014) Weekly fish consumption is associated with increased grey matter volumes in the human brain's hippocampus, prefrontal, posterior cingulate, and orbital frontal cortex (Raji et al., 2014) and is associated with a lower risk of dementia and other cognitive disorders like mild cognitive impairment in older people.

It may also lower the risk of developing Alzheimer's disease (Morris et al., 2003). Fish oil and related actives, such as omega-3 and omega-6 PUFAs, play an important role in maintaining skin homeostasis, improving skin barrier function, and inhibiting UV-induced ageing. Consumption of fish is attributed to reduction in hyperpigmentation and accelerating skin wound healing. The amino acid arginine, as well as the omega-3 polyunsaturated fatty acids found in fish, have been shown to be extremely effective against infections and wound healing. Owing to such great benefits, it is critical to promote the consumption of fish and shellfish. It has been reported that fish plays an important role in the human diet and is one of the most important sources of animal protein and has been widely accepted globally as a good source of protein and other elements for the maintenance of healthy body (Ravichandran, 2012).

Fish provides a number of nutrients, including protein, the long-chain omega-3 polyunsaturated fatty acids (n-3 PUFAs), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (in particular, in oil-rich fish), and a number of vitamins and minerals. In comparison to meat, poultry and eggs, fish is low in saturated fatty acids (Bates et al., 2012). The studies found that various species of fish

have different health benefits e.g., Trout Fish can provide many nutrition and health benefits mainly to women around pregnancy, young children and teenagers, and older adults. Trout contains 5 percent fat of which much comes from Omega-3 fatty acids and Omega-3 fatty acids provide many health benefits, which include reducing the risk of death by heart attack, stroke or heart disease. The study conducted by Waweru (2012) reported that Trout fish helps in preventing fatal arterial clogging, and slows down ageing and help in reduction of bad cholesterol and blood pressure etc.

Trout fish is delicacy for many people around the world and has mild fish smell and is ideal fish for all the age group including children and helps in better brain development. Kashmir, being an agricultural economy is having water and land as its most valuable natural resources. Lakes play an important role in the economy of the state and are of tremendous academic, societal and economic importance. Kashmir is blessed with a number of lakes such as Manasbal lake, Wular lake, Dal lake etc (Balkhi et al., 1987).

The Kashmir valley is a land of lakes, rivers, flowers and fast running streams. The main ones being the Wular Lake, the enchanting Dal Lake, the Manasbal Lake, the Anchar Lake, the Nageen Lake, the Jhelum River, snow fed streams like the Sindh stream (District, Gandherbal), the Lidder (District, Anantnag), the Erin and the Madumati (District, Baramulla). The other vital streams include Hipora, Hambiara stream, Naristan stream, Lam stream, Aripal stream, Chandriara, Shilon stream, Budkul stream, Watal Ara stream, Khrew stream, Wuyan stream, Mohkand-Ara stream and Romeshi stream in district Pulwama; Sukhnag, Dudh Ganga and Shallinga in district Budgam and Phoru, Kishanganga, Nallah Kehmil, Nalla Lolab, Nalla Kalaroos Machil Nalla Bata Maji, Nalla Qazinag, Talri Nalla, Mawar and Dringyari in district Kupwara.

These water bodies of Kashmir valley provide huge scope for the development of diversified fisheries in the state. The major fish fauna of Kashmir water bodies comprise of exotic carp (*Cyprinus carpio*) and indigenous *Schizothorax* species. In Jammu and Kashmir region thousands of people earn their living by fishing directly or indirectly. The valley of Kashmir is gifted with significant and valuable stocks of fish, leading to a tradition and culture of fishing in the region. The region of J&K is bestowed with a network of both cold & warm water streams, perennial rivers, lakes, reservoirs, sars and about 250 high altitude lakes

spread over an area of 40 thousand hectares. There is an immense scope to promote all types of fisheries in view of J&K's varied agro-climatic conditions. In J&K region 27781 Km length of rivers/streams facilitates farming of 20.70 Thousand Tonnes of fish and generating revenue of 585.29 Lakhs. There are various fish species in Kashmir water bodies. The Jammu and Kashmir region, especially, Kashmir is major contributor in trout which was successfully introduced in the state during 1990 (Ayyappan, et al., 2011) produces 482 Tonnes worth 294.52 lakh. It is reported that (Wikipedia Malnutrition in India, 2016) in spite of all the benefits of fish and trout consumption and its availability in India, the prevalence of underweight children is among the highest in the world, with dire consequences for mobility, mortality, productivity and economic growth. Therefore, there is need to assess the fish consumption pattern of the people of Kashmir in order to understand problem of malnutrition in Kashmir region.

We know consumer is the most unpredictable component of the value chain and the behaviour of consumer is governed by various factors which have a direct or indirect influence on preference for a particular product. Das et al., (2013), in their study in Tripura reported 87.5% of the consumers preferred locally produced fresh fish. In another study, Davidson et al., (2012), found that Hawaii consumers were willing to pay more for wild-caught fish than farm raised and more for fresh fish than previously frozen fish with the degree of preference changeable across species.

Under this background and in view of the literature available (e.g., Palash and Sabur, 2014; Prasad and Madhavi, 2014), the study on consumer behavior and constraints in consumption of fish in Anantnag district of Kashmir valley was undertaken. The finding of the present study will help in formulating strategies for improvement in fish consumption in the study area which will go a long way in improving nutritional status of the people in the area.

Material and Method

The current study on consumer behavior was carried out during the period of 2020-21 in Anantnag district of Kashmir valley with the help of a well-structured open ended validated questionnaire. The study was carried out to understand the behaviour of fish consumers. The data for the same was collected at random from 400 respondents from the selected district. Fishermen were also approached

to discuss the problems they face in this business. The data collected was analyzed using standard statistical tools with the help of statistical software SPSS (version 20).

Results and Discussion

The consumer's behaviour is influenced by his/her socio-economic status and so it is imperative to know the socioeconomic profile of consumers before studying their behaviour. The data shown in Table 1 reveals that majority of fish consumers lived in joint family (70.25%), family head were male (93.25%), 59.25% respondents were male.

Table 1: General profile of the fish consumers in District Anantnag of Kashmir valley, J&K.

Variable	Type	Count	Percentage
Family type	Joint	281	70.25
	Nuclear	119	29.75
Head of the family	Male	373	93.25
	Female	27	6.75
Respondent	Male	237	59.25
	Female	163	40.75
Age of the respondent	20-30	31	7.75
	31-40	59	14.75
	41-50	148	37
	>50	162	40.5
Family size	Upto 4	43	10.75
	5-Jul	223	55.75
	>7	134	33.5
Education level of Head of Family	Illiterate	39	9.75
	Middle	169	42.25
	Higher Secondary	72	18
	Graduate	83	20.75
	Masters and above	37	9.25
Family Status	Low	21	5.25
	Middle class	379	94.75
Profession	Agriculture	107	26.75
	Govt Job	45	11.25
	Business	179	44.75
	Private Job	48	12
	Other	21	5.25

Further, our study revealed that majority of the

respondent (40.50%) were in the age group of >50 years, (55.75%) respondents had 5 to 7 members and majority of the head of households (42.25%) were middle pass. Majority (94.75%) respondents were from middle class families, 44.75% respondents were involved in business, followed by Agriculture (26.75%), followed by followed by Private job (12%), followed by Govt. job (11.25%) and other (5.25%) .

Table 2: Behaviour of Fish Consumers in District Anantnag of Kashmir Valley, J&K.

Parameters	Category	Count	Percentage	P-value
Awareness about health benefits of Fish eating	Yes	293	73.25	<0.05
	No	107	26.75	
Knowledge about Fish Production in J&K	Yes	23	5.75	<0.05
	No	377	94.25	
Quantity of Fish purchased per visit (kg)	0.5-1	88	22	<0.05
	Upto 2	193	48.25	
	>2	119	29.75	
Respondents Purchasing frequency of fish	Once in a week	11	2.75	<0.05
	Once a fortnight	23	5.75	
	Once in a month	79	19.75	
	Once in 6 months	141	35.25	
	Once in a year	83	20.75	
Willingness to purchase fish product	Occasionally	63	15.75	<0.05
	Fresh Fish	379	94.75	
Satisfied for the cost of fish during purchasing	Processed fish product	21	5.25	<0.05
	Always	81	20.25	
	Not always	204	51	
	Sometimes	115	28.75	

The data shown in Table 2, reveals that in response to statement 1 related behavior of fish consumers i.e., awareness about health benefits of fish eating, 73.25% respondents were aware about the health benefits of consumption, in response to statement 2, i.e., knowledge about fish production in J&K, 94.25 were not aware about the fish production in J&K region, in response to statement 3, i.e., quantity of fish purchased per visit (kg), majority of the respondents (48.25%) reported upto 2 kg, in response to statement 4, i.e., respondents purchasing frequency of fish, majority (35.25%)

of respondents reported that once in 6 months they purchase fish, in response to statement 5, i.e., willingness to purchase fish product, majority of the respondents (94.75%) chose to purchase fresh fishes and in response to statement 6, i.e., satisfaction for the cost of fish. 51.0% respondents reported that they were not always satisfied for the cost of fish. The rates are not fixed and it causes problems to consumers. Eating fish a couple of times each week is an immense way to get lean protein along with essential nutrients. It is important to mention that some types of fish are better choices than others due to a lower likelihood of contaminants, such as mercury. A medical doctor can make individual recommendations about the consumption of mercury-containing fish for children, people who are pregnant or breastfeeding, or those with health conditions. Statistically, for each statement, there was a significant difference among the responses ($P < 0.05$). The pictures shown below reveal that in Anantnag district, we do not have systematic fish market. The poor fish sellers as well as customers are facing lot of problems in marketing.



Source: Field survey, 2020-21

The data presented in Figure 1, shows that preference of consumer depends on the availability of Fish in the market and cost of Fish per/kg. It is obvious income and choice is positively related. Majority of respondents (32.5%) have no special choice, followed by choice of carp (29.5%), followed by choice of trout (27%) as Trout is very tasty and easy to cook, and 11% respondents prefer Schizothorax because of its taste.

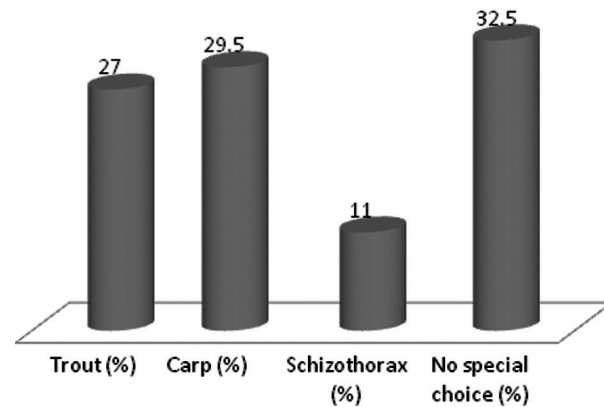


Fig. 1: Consumer Choice of Fish Species.

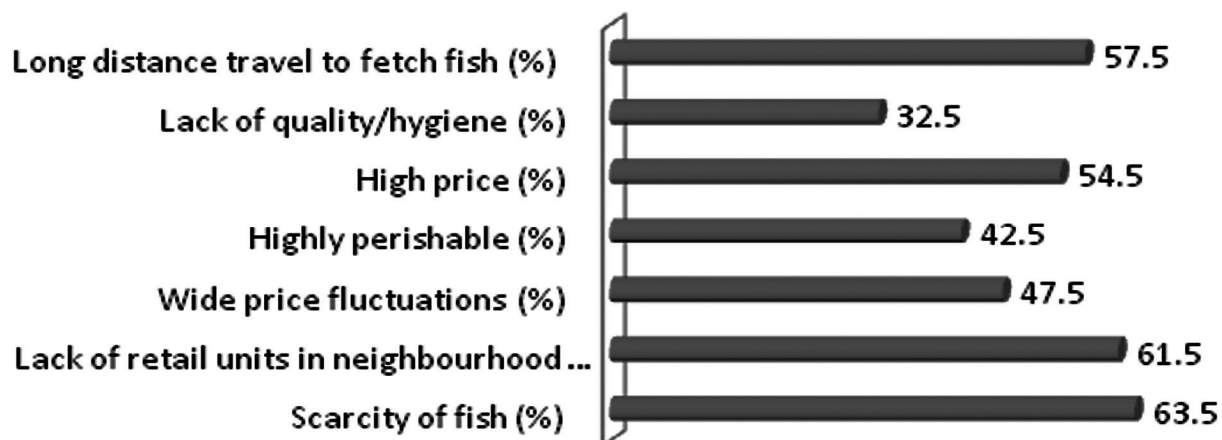


Fig. 2: Constraints faced by the fish consumers.

The data shown in Figure 2, reveals that in response to statements related main constraints faced by the fish consumers in district Anantnag, 63.5% respondents reported scarcity of fish, followed lack of retail units in neighborhood (61.5%), followed by long distance travel to fetch fish (57.5%), followed by high price (54.5%), followed by wide price fluctuations (47.5%), followed by statement fishes are highly perishable (42.5%) and lack of quality/hygiene (32.5). The results of our study are in agreement with the earlier studies

The data shown in Figure 3, revealed that in response to the statements asked to the people involved in fish marketing about problems they face in fish marketing in district Anantnag, 82.5% reported storage problem, 78.5% reported lack of marketing facility in the district, 74.5% reported high transportation cost, 68.5% reported unavailability of ice and 62.5% respondents reported they face packaging problem during fish marketing. The results of our study coincide with the results of earlier studies conducted in other districts of Kashmir valley.

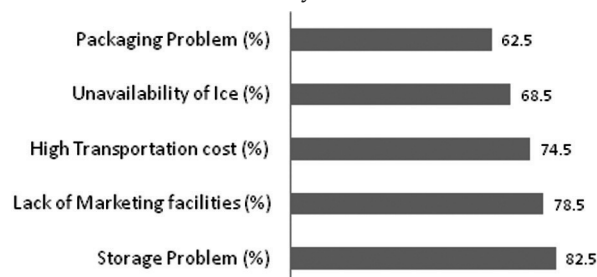


Fig. 3: Main Constrains faced in Fish Marketing.

Conclusion

The present study showed people in district Anantnag of Kashmir valley like fish and consume fish on regular basis for its taste and health benefits. The majority of the people under study (27.0%) preferred Trout because of its taste and easy preparation, 29.5% preferred Carp for its easy availability and less cost, 11.0 % preferred Schizothorax because of its taste and its identity in Kashmir and 32.5% respondents had no specific choice. The group discussion revealed that 73.5% respondents believe that there is a great scope for fish farming in Kashmir valley. The study also revealed that people in higher income group prefer trout fish and showed willingness to pay higher prices than prevailing if easily available. The majority of the respondents preferred trout due to its taste and freshness while 50 percent respondents preferred due to its nutritional quality. It is scientific

fact that consumption of trout fish is very beneficial for health and its production should be encouraged to improve its availability in the market which can fill the gap of nutritional deficiency mainly in the hilly areas. The Trout culture introduced in 1990 has well accepted in Kashmir valley and it can play crucial food item in other Himalayan region where trout culture can be carried out. The J&K region has only about 0.07 lakh hectares under reservoir area so there is a huge gap between the demand and supply of fish in the study area. Fish is a valuable element of diet of the local people throughout the year.

There is also a demand for fish from the defense personnel and tourists. There are 1248 lakes including water bodies and water is spread into 39921.8 hectares of area which gives an indication of the potential for fisheries in the region. The gap in the demand and supply suggest that the study area needs to promote fish culture and at the same time need to be well equipped in terms of human capital to effectively execute its duties and responsibilities.

The current study showed that people involved in fish marketing face a number of problems like Storage problem, Lack of Marketing Facilities, High Transportation Cost, Unavailability of Ice and Packaging Problem. Researchers report that the foods we eat influence our health. Fish besides containing protein and other nutrients like vitamin D and selenium, fish also contain a specific type of fat, omega-3 fatty acids, that may reduce the risk of developing heart disease and other health problems. In view of the importance of fish in our life, J&K Government should work for the improvement of marketing facilities, organize awareness programmes related fish, provide financial support to the beneficiaries and take innovative steps to encourage sustainable fish production from reservoirs and ponds in the region.

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