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Assessment of Fishery Products Consumption Behavior: the Case of Turkey

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Abstract

From the early history of humanity until today, fish and other fishery products have always been involved in human diet. The intake of a sufficient number of proteins has been enabled through high-quality fish meat containing a significant quantity of essential amino acids as well as omega-3 fatty acids. According to the studies, 150 grams of fish, meets the needs of a 50-60% of daily protein intake for an adult. A large part of fishery production in Turkey (86%), is consumed fresh. Turkey, within the scope of Common Fisheries Policy is trying to harmonize fisheries with the EU. A failure to update the 1380 coded Fisheries Law and rapid issuing of EU compatible regulations, safe food for consumers, high quality products along the year for processing industry and marketers, as well as the inability to ensure sustainable price development for the producers, prevent the success of the sector. The aim of this study was to determine the consumption behavior when taking fishery products in terms of food safety, reliability, product quality as well as the level of income and education.

Key words: fishery products, behavior, consumption, Turkey

Introduction

As it is known, fish and other fishery products, have become the oldest food supply and from the early history of people until today, it's always been involved in the diet of humans. Also today, because of the need to meet a significant portion of proteins, such as omega-3 fatty acids and essential amino acids, as a protein rich source of high-quality, fish meat is the most important alternative food source. Thus, according to the studies (FAO, 2014), 150 grams of fish, meet the needs of 50-60% of an adult's daily protein. Therefore, it is recommended for consumption at least twice a week (300 g). However, while Turkey is surrounded by sea on three sides, and although it has rich inland water sources, aquaculture domestic consumption is relatively low. The aim of this study was to determine the consumer behavior towards fishery products in Turkey in terms of food safety, reliability, product quality as well as the level of income and education.

Material and Methods

The research was mainly based on legislation and literature scan. The main material of research is made from a variety of references and research on legislation related to fish consumption practices. In the context, subjects have benefited from the reports, statistics, and published articles, and in particular the latest developments were tried to obtain from the study report via internet browsing. In Turkey, information from relevant institutions has been attempted to gather through interviews and correspondence. In addition, both by examining legislation and through preliminary interviews with relevant companies we tried to learn their thoughts on fish consumption.

Results and Discussion

Examining the protein sources worldwide, the vegetable protein sources ranked in #1. The source of animal protein ranked in #2. According to FAO (2014), fishery products as a source of animal protein, constitute 16.6% of the global population's protein intake and 6.5% of the total proteins consumed. In Turkey, 72% of the daily consumed proteins are vegetable based foods (FAO, 2014). On the other hand, according to data released by the FAO (2014), total protein consumption per capita in Turkey is sufficient.

In this context, Turkey with its status of nutrition has the appearance of both a developing as well as a developed country.

As known, one of the important criteria used in determining the country's level of development is the amount of animal food consumed per person, a causal connection between the development and animal protein consumption.

However, the nutritional status of people in Turkey shows major differences according to social and economic levels, urban-rural locations and seasons. The main reason for this situation is the imbalance in the distribution of income and education. Therefore, the preferred source of protein showed differences between continents, countries, regions and even cities. Annual seafood consumption per capita in Turkey (6.3 kg) is much lower than the world (18.6 kg) and EU average (23 kg) or the Near East average (9.7 kg). Even among the Near East countries, Turkey ranked in the 7th place when it comes to seafood consumption per capita. Indeed, according to the Food and Agriculture Organization of the United Nations records, Turkey is considered among the countries that consume little or no fish. Here it is understood that, among many countries of the world fisheries production, despite having a very important place in the food chain, Turkey cannot use and consume enough natural wealth (FAO, 2014). In the future of human nutrition, since they are the most important source for eliminating the animal protein deficit, fishery products potential is not unlimited and it's impossible to continuously increase the production as the population increase, after a certain level, a fishery product per capita is expected to decrease and the demand is limited by the amount of production. Thus, the increase of fishery production and stable fish prices are needed for the increase of per capita consumption. However, due to the increasing globalization and urbanization, consumers face a product change, while benefiting from fishery products as an alternative protein sources.

Tab. 1. World consumption of fishery products (%)
Свјетска потрошња производа од рибе (%)

Consumption Types <i>Начин конзумације</i>	Developed Countries <i>Развијене земље</i>	Developing Countries <i>Земље у развоју</i>	World <i>Свијет</i>
I. Total Food <i>Укупно</i>	82.0	80.7	86.4
1. Fresh / <i>свеже</i>	3.3	47.3	40.5
2. Frozen / <i>замрзнуто</i>	44.2	16.0	23.0
3. Baked / <i>пржено</i>	11.8	7.9	8.9
4. Canned / <i>конзервирано</i>	22.6	9.5	14
II. Non-Food Use / <i>осим исхране</i>	18	19.3	13.6
5. Raw material / <i>сирова риба</i>	16	13.7	10.2
6. Various purposes / <i>остало</i>	2	5.6	3.4

Source: FAO, 2014 (Извор: FAO, 2014)

Until the last few years, fishery products in Turkey were usually consumed fresh, but they are now available to consumers after being subjected to processing and preservation technologies, such as refrigerated, frozen, salted, canned, smoked, dried and marinated.

In Turkey, a large amount of fishery products (86%) are consumed fresh, despite the trend in the world. Processed products are mainly export oriented. As of 2013, 78.9% of fishery production in our country is considered domestic consumption as human food. It has to be specified that, 75% of this consumption is fresh, 4% frozen and 2% processed, while the rest (19%) is for other purposes like fishmeal and fish oil. If countries development criteria such as proper nutrition and wellness awareness thought to be directly related to fish consumption, Turkey which is located in the developing countries group, has not yet fully achieved success in ensuring enough consumption of fish products. However, there are large regional differences observed in Turkey's fish consumption. The amount of fish consumption decreases while the production is higher from coastal areas to inland, where even sea bass and sea bream fish species are not well known. In this context, according to a research, anchovy consumption is in the first place in the Black Sea region and trout is in the first place in the East Anatolia region (Orhan and Yüksel, 2010; Erdal and Esengün, 2008; Aydın and Karadurmuş, 2013; Şen et al., 2008).

Indeed, per capita fish consumption in the Black Sea is 25 kg, for major cities in the region it is 16 kg, while in Eastern and Southeastern Anatolia it is only 0.5 kg. The main reasons are the fish consumption habits and the additional costs of delivery. The low level of income is also effective. In the fishing season in marine areas, species such as anchovy, mackerel and sardine are consumed as they are captured in large quantities and sold at appropriate prices. In the inner areas inland fishes with anchovy from the Black Sea region, along with imported frozen mackerel in late years, are often served for consumption.

Turbot, sea bream and sea bass are expensive species that are consumed by high-income customers and tourism industry. Another issue to be considered is the uneven distribution of processing facilities. There are 234 firms located in Turkey that are processing and marketing fishery products. 92% of those firms have EU competence for the product sales (TurkStat, 2013). However, establishment of more numerous and modern processing facilities including freezing, salting, canning and packaging units for fishery products will provide a more significant economic contribution to the sector. An average of 150 thousand tons of the product processing facilities have been established in the areas of West Black sea, Marmara and Aegean regions, for more capture areas and close to consumer centers.

These regional imbalances are preventing the development of fishery products in the location of fish processing facilities and affect the level of per capita fish consumption which is still very low in the middle and eastern regions. If there is a trend towards the development of more packaging facilities because of the growth of the fishery sector in recent years for the management of fresh aquatic products, this trend should further be encouraged and institutionalized. As research shows, one of the most important reasons for the low demand of fish is the price instability. Seasonal fluctuations in the market price of fishery products lead to a serious change. In recent years, seafood prices in Turkey have been between 1.7-2.20 TL/kg, while in aquaculture 5.59-6.73 TL/kg and in the inland fishery products they are 2.78-3.54 TL/kg.

The average product price was between 2.80-3.43 TL/kg and experienced a major change in years (TurkStat, 2013). As from here it is possible to say that, despite the rising cost of production, product prices remained behind inflation and the profitability of producers gradually reduced (Tab. 2, 3).

In this context, social and economic structures of the fish consuming families were examined in the Antalya province, which is a seaside and tourism center city in Turkey.

Tab. 2. Development of current fish prices (tl/kg)

Развој тренутних цијена рибе (tl/kg)

Year Год.	Fisheries (Marine) / рибарство (морске воде)								Aquaculture / аквакултура		
	Anchovy Ињун	Horse mackerel Шњур	Gray Mullet Ципол баташ	Sea Bream Орада	Red Mullet Барбун баташ	Blue fish Плава риба	Sea Bass Бранџи	Turbot Иверак	Trout (Inland) Пастрмка (контин.)	Sea Bream (Marine) Орада (морска)	Sea Bass (Marine) Бранџи (морски)
2000	0.45	0.80	1.50	3.00	2.50	3.00	3.50	3.50	1.25	2.30	2.60
2005	2.50	4.00	5.00	12.00	10.00	11.00	13.00	20.00	4.10	7.80	7.40
2010	1.53	3.63	4.50	13.16	16.56	10.80	15.03	30.11	4.30	8.70	8.00
2011	1.84	3.75	4.87	18.00	17.46	12.07	20.91	35.23	4.68	9.38	8.90
2012	2.04	3.69	5.60	18.40	18.74	12.41	22.08	39.81	4.99	8.97	10.99
2013	2.39	4.30	6.34	18.35	18.91	14.24	26.08	44.81	4.68	9.62	10.48
2014	3.29	5.13	6.78	19.44	20.95	12.50	27.02	49.12	-	11.04	12.06

According to the survey conducted during a fishing season, a family monthly consumption of fish appeared to be around 4.8 kg. In the same period in the lowest income group, monthly amount of fish consumption was 2.3 kg, in the low income group 4.3 kg, in the middle income group 5.9 kg, while in the highest income group it was 8.5 kg (Yilmaz et al., 2014). In the study, fish consumption by families based on income and education level is proportional, and it was determined that the most important factors affecting the consumption

of fish, are that fish is a healthier food, with high nutritional value and that it is delicious (Yılmaz et al., 2014).

Tab. 3. Development of year 2014 fish prices with the real prices (tl/kg)
Razvoj cijena ribe u 2014 sa realnim cijenama (tl/kg)

Year Год.	Fisheries (Marine) / рибарство (морске воде)								Aquaculture / аквакултура		
	Anchovy Ињун	Horse mackerel Шњур	Gray Mullet Цигол баташ	Sea Bream Орада	Red Mullet Барбун блаташ	Blue fish Плава риба	Sea Bass Бранџин	Turbot Иверак	Trout (Inland) Пастрмка (контин.)	Sea Bream (Marine) Орада (морска)	Sea Bass (Marine) Бранџин (морски)
2000	2.49	4.43	8.31	16.61	13.85	16.61	19.38	19.38	6.92	12.74	14.40
2005	5.18	8.29	10.36	24.87	20.72	22.80	26.94	41.45	8.50	16.16	15.34
2010	2.09	4.96	6.15	17.99	22.64	14.77	20.55	41.17	5.88	11.90	10.94
2011	2.37	4.83	6.27	23.17	22.47	15.53	26.91	45.34	6.02	12.07	11.45
2012	2.41	4.36	6.62	21.75	22.15	14.67	26.10	47.06	5.90	10.60	12.99
2013	2.61	4.69	6.92	20.03	20.64	15.54	28.47	48.92	5.11	10.50	11.44
2014	3.29	5.13	6.78	19.44	20.95	12.50	27.02	49.12	-	11.04	12.06
ann. raise %	2.00	1.05	-1.44	1.13	3.00	-2.01	2.40	6.87	-2.31	-1.02	-1.26

Source: TurkStat, 2013 (Извор: TurkStat, 2013)

As the level of education is higher, the fish consumption increases which is an indicator of awareness that fish is beneficial to the health. In fact, in the Antalya's neighboring province of landlocked Burdur, at the priority order of preference, the fact that fish is healthy came at the first place (69.5%), then came its taste (31.8%), family habit was at the third place (16%) and the final and the fourth (15.6%) reason for choosing fish was that it is cheaper than other animal food (Orhan and Yuksel, 2010).

Negative factors of fish consumption are respectively dirt and smell created when cooking, not appropriate to the palate, can be made of one type of food, followed by opinions that it is expensive (Hatırlı et al., 2004; Özkan et al., 2006; Orhan and Yuksel, 2010; Yılmaz et al., 2014).

There are consumer opinions that fish is still a luxury in Turkey. Therefore, a research results are given in Tab. 4 about meat related expenditure and price elasticity of demand for products. While expenditure flexibility calculated for red meat and chicken was under 1.00 and very close together, the spending flexibility for fish is estimated to be greater than 1. Accordingly, in the face of the increase in total expenditure, households have less sensitivity to red meat and chicken, while it showed to be higher for fish. According to these results, fish is a luxury, while red meat and chicken are essential goods.

Price flexibility of fish (-0.515), is also higher than the red meat and chicken prices flexibility. Accordingly, the increase of fish price by 1% will reduce the fish demand by 0.515%.

Tab. 4. Expenditure and price flexibilities

Трошкови и флексибилност цијене

Product <i>производ</i>	Expenditure flexibility <i>флексибилност трошка</i>	Price flexibility <i>флексибилност цијене</i>
Red Meat / <i>Црвено месо</i>	0.833	-0.203
Chicken / <i>Пилетина</i>	0.832	-0.542
Fish / <i>Риба</i>	1.502	-0.515

Source: Hatırlı et al., 2007 (Извор: Hatırlı et al., 2007)

Moreover, it was found that when buying fish, high income and multi-cultural families prefer stores and fishermen shops while low income families prefer a neighborhood market. Antalya province householders have high levels of education. Generally in Antalya, where the head of the family of higher education graduate is 33.7%, in the neighboring provinces of the landlocked Isparta and Burdur the ratio is 33.3% and 37.1%, respectively (Hatırlı et al., 2004; Özkan et al., 2006; Orhan and Yüksel, 2010; Yılmaz et al., 2014).

In another study conducted in 2015 to reveal various judgements related to consumers' fish supply, consumption and reliability (Yılmaz et al., 2015), it's been identified that fish has mostly a positive impact as expected to human health and consumers believe that they should eat (at least) one portion of fish a week. While there was no difference by age group and educational level in these two judgments, the proportion of respondents that everyone should eat one fish portion twice a week is more favorable to the judgment in the high-income group. This difference is statistically significant ($\alpha = 0.01$). The majority of the consumers establish a parallel between the fish healthiness and the pollution of waters. In addition, a large portion of consumers know the features that the fresh fish must have. The proportion of respondents knowing these features is greater and statistically significant in high-income group ($\alpha = 0.05$). As for the supply of fish to consumers in terms of reliability, the fact is that fish markets and fishermen have a more positive approach as marketers emerge. The reliability of fish in a district market is moderate while the fish sold by peddlers is found of lower quality.

In addition to the survey, more than a half of consumers think that the sale of fish by peddler should be banned. This idea is found statistically different by the income and education groups in the 1% significance level. From the nutritional point of view, consumers participating in the survey state that there is no difference between farmed fish and marine fish and the ratio is

21.5%. From the food safety point of view, there is no difference between farmed fish and marine fish and the ratio is 22.9%. These differences, as mentioned before, are in favor of marine fish. At the same time, 67.5% of consumers find the fish prices high.

In this regard, especially groups under 30 years of age had a particularly greater rate. This difference in age groups was found statistically significant ($\alpha = 0.05$).

In the study, it has been found that an important part of consumers lacks the information on food safety and they are not sure about the safety of the food they consume. The majority of consumers think that the lack of information is related to the food inspection and reliability studies.

Surprisingly, results in recent years show that consumers see minimum risk in animal products, fish product group in particular, and especially consider fishing to be more reliable.

Fish is followed by milk and dairy products, red meat, chicken and turkey meat. Meat products (sausage, salami, variety meat, etc.) are considered to be the riskiest group. Eliminating the doubt heard about the reliability of fish from aquaculture is seen as important for the fishery.

According to the study, a completely fresh fish is considered as the first choice for consumption. Consumers still avoid buying frozen and processed fish. For them, frozen fish is either staled or defrosted and frozen again. This condition makes it necessary for fish to be better iced, which can make a positive contribution in this regard. However, income levels and purchasing power increases, the rate of labor force participation among women, along with the desire to better spend time outside work, but besides that, factors such as starting to make more purchases from supermarkets can be expected to direct consumers to more fish fillets and value-added products. One of the most important factors affecting the decrease in fish consumption, as mentioned before, is the low level of income. Indeed, as the low-income customers opposed initially, it is determined that they choose frozen seafood with the appropriate price. For this, it has to be a sufficient quality product (fresh and frozen products made of effective cold chain distribution). At the same time, attention should be paid to enter a market at a price point that is competitive with substitute products. In addition, fishery products should be led to making more revenue-generating value-added ready meals.

Conclusion

According to studies, the consumption of fishery products in Turkey is insufficient, as it is decreasing. In recent years the increasing of production, the improving of cold chain conditions and due to technological advances, consumption has increased in some areas yet household fish consumption patterns are not sufficiently developed.

However, the increase in purchasing power, directed to healthy consumption, families in the demand for fast food because of working women, positively affects the demand for fishery products. On the other hand, the fact that our population is high, our per capita consumption of fishery products may seem lower, compared to some countries.

In addition, it is observed that factors such as offer imbalances in the market have caused a decrease in the average consumption over the last 10 years.

In fact, according to a research, fish consumption is directly related to family income, age and educational attainment, chicken and red meat prices, the tastes and habits, metropolization as well as the level of offering.

In this context, positive aspects of fish are both a healthy diet and a production potential in Turkey which will create added value; continuing to work towards the identification of factors affecting the fish consumption in Turkey and the development of necessary policy recommendations of paramount importance. Public spotlight of MFAL (Republic of Turkey's Ministry of Food, Agriculture and Livestock) in recent days is quite successful in this sense. Turkey, in the process of the accession negotiations with the EU, within the scope of Common Fisheries Policy (13. chapter) is trying to harmonize fisheries with the EU. Within the scope of the Common Fisheries Policy, activities such as storage and protection help, price adjustment, compensation support are performed for ensuring the price stability for producers, processing industry and consumers. A failure to update the 1380 coded Fisheries Law and rapid issuing of EU compatible regulations, safe food for consumers, high quality products throughout the year for processing industry and marketers, as well as the inability to ensure sustainable price development for the producers, prevent the success of the sector. Ensuring the sectoral development, processing and the storage conditions with the infrastructure work to ensure the organization of the market must be accelerated and supported to increase the added value of the product.

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Процјена ставова потрошача о производима од рибе: случај Турске

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Сажетак

Од ране историје човјечанства до данас, риба и различити производи од рибе су укључени у исхрану људи. Унос довољних количина протеина, омогућен је кроз исхрану високо-квалитетним рибљим месом, које садржи значајну количину есенцијалних аминокиселина као и омега-3 масних киселина. Према неким истраживањима, 150г рибљег меса омогућује 50-60% дневног уноса протеина за зрелу особу. Турска, у складу са циљем "Common Fisheries Policy" настоји да усклади стандарде из области рибарства са Европском Унијом. Недовољно усклађени Закони о рибарству као и све већа питања усклађивања са новим регулативама ЕУ у погледу здраве хране, високо-квалитетних индустријских и трговачких производа током године, као и немогућност одржања стабилне цијене за произвођаче, успорава развој овог сектора. Циљ овог истраживања представља анализа ставова потрошача о производима од рибе, у контексту сигурности хране, поузданости, квалитета производа, увоза, као и едукације.

Кључне ријечи: производња рибе, став потрошача, потрошња, Турска

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