Yunus Araştırma Bülteni 2015 (2): 45-57

www.yunus.gov.tr
ISSN 1303 - 4456

Araştırma Makalesi
Research Article

Fish Consumption Preferences of Consumers in Trabzon, Turkey

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Receive: 25.12.2014
Accepted: 19.02.2015

Özet

Trabzon İlindeki Tüketicilerin Balık Tüketim Tercihleri

Bu çalışma Trabzon ilinde yaşayan tüketicilerin balık tüketim alışkanlıkları ve tercihlerini belirlemek, tüketimi olumlu ve olumsuz yönde etkileyen faktörleri ortaya koymak amacıyla yürütülmüştür. Anlaşılır ve kolay 27 sorudan oluşan bir anket il nüfusu göz önüne alınarak 390 kişiye sorulmuştur. Çalışma Haziran-Kasım 2013 tarihleri arasında gerçekleştirilmiştir. Katılımcıların demografik özellikleri ile birlikte balık tüketim şekli, sıklığı, tercih edilen türler gibi konularda bilgiler toplanmıştır. Demografik özelliklerinin balık tüketimini ne şekilde etkilediğini belirlemek amacıyla sorulan sorularla bağlantılı olarak bazı hipotezler geliştirilerek test edilmiştir. Katılımcıların yalnızca %0.8'i hiç balık tüketmediğini ifade etmiş ve bunun sebebi de en fazla "kötü koku" ve "aile bireylerinin sevmemesi" olarak açıklanmıştır. Kişi başına tüketim 23 kg/yıl olarak hesaplanmıştır. Hamsi (%34,4) ve alabalık (64,9) en fazla tercih edilen doğal ve kültür balıkları olarak tespit edilmiştir. Kıyısal kesimlerdeki tüketim iç kesimlere oranla daha yüksek bulunmuştur. Balık tüketiminde tatmin düzeyi kıyı ve iç kesimler arasında önemli derecede farklılık göstermiştir ($P<0.005$). Kıyı kesimde yaşayanlar bu düzeyi "çok iyi" ve "iyi" olarak ifade ederken; iç kesimdekiler "iyi veya orta" olarak belirtmişlerdir.

Anahtar Kelimeler: Balık, tüketici tercihleri, anket, Trabzon.

Abstract

This study was carried out by the aim of achieving a good knowledge on the fish consumption habits and preferences and determining motives and barriers for fish consumption of consumers living in Trabzon Province of Turkey. A comprehensive and simple questionnaire (27 questions) was developed and asked total 390 individuals from June to December 2013. Respondents provided demographic data and fish consumption patterns towards frequencies, average meal portion wild, farmed fish preferences, etc. In relation with these questions it was established some hypotheses to evaluate, how demographic properties of participants effected on the fish consumption patterns. Only 0.8% of participants stated that they never consume fish. The most frequent reasons for this were "no fish consumption habit", "bad smell", "dislike of family members". Per capita fish consumption was calculated as 23kg/year. The first priorities for wild aquaculture fish species were anchovy (64.6%), and trout (64.9%) respectively. The consumption in coastal districts was higher than inland districts. There was a significant difference, ($P<0.005$) between settlements on satisfaction level of fish consumption; participants from coastal settlements stated "my satisfaction level is very good" or "good", participants from inland settlements "good or mediocre".

Keywords: Fish, consumer preferences, questionnaire, Trabzon.

Introduction

Being a peninsula, surrounded by 8333 km coast line, Turkey has an important potential for fishery activities by means of seas, lakes and dams (Anonymous, 2001). Annual fisheries production was approximately 644852 tons in Turkey in 2012; of which 315636,5 tons (49%) obtained by catching from sea, 36,120 tons (5.6%) inland waters and 212410 tons (33%) obtained by aquaculture activities. Unfortunately per capita seafood consumption of the country is 7.1 kg/year (TUIK, 2012a) which is well below from the European Union countries, average is 22.0 kg per year (FAO, 2012).

Seafood are important sources of nutritional elements, containing a good amount of high quality protein and long chain polyunsaturated fatty acids particularly eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (Balçık Mısır, 2010). Besides, fish is also rich in many micro nutrients like selenium, iodine and some vitamins (IOM, 2007; Nunes *et al.,* 2006). Many international organizations and countries recommended daily intake of DHA+EPA ranging from 0.3-0.5 g/day by World Health Organization (WHO); 0.8 g/day by North Atlantic Treaty Organization (NATO); 1-2 g/day by Norway. The most recent recommendations were given by American Heart Association (AHA) as; adults should consume fish at least twice a week. On the other hand, patients with coronary diseases should consume 1 g of EPA+DHA daily; while patients with hypertriglyceridemia should consume 2-4 g/day of EPA+DHA (Bagga *et al.,* 2002).

There are many studies exist in many countries that evaluate the seafood consumption preferences. Myrland *et al.,* (2000) determined the seafood consumption in Norway, Nayga and Capps (1995) searched the effect of socio-economic factors on the probability of consuming fish and shellfish in both outside and at home. Cardoso *et al*. (2013) studied the topic "Survey into the seafood consumption preferences and patterns in the Portuguese population; Gender and regional variability"; Verbeke and Vackier (2005) investigated individual determinants of fish consumption behavior based on crosssectional data collected in Belgium. But in Turkey generally local research studies have been conducted (Eygi Erdoğan *et al.*, 2011; Şen *et al*., 2008; Saygı and Hekimoğlu 2011; Aydın *et al.,* 2011; Akpınar *et al.,* 2009; Hatırlı *et al.,* 2004; Sayın *et al.,* 2006; Gürgün, 2006; Dağıstan *et al.,* 2009; Çolakoğlu *et al.,* 2006; Elbek *et al.,* 1999).

Several authors stated that fish consumption may influenced by different aspects such as species of fish, season, nutritional value, sensory properties, price, health related aspects, convenience, availbility, catching origin, product form (fresh, frozen, salted, etc.), obtaining origin (wild or farmed).

Additionally demographic differences (gender, age, education level, occupation, monthly income) are also effective on the consumption preferences. All these factors may be change due to regions. Regions are the key factors on different consumption patterns because every different environment carries different potentials that effect on consumption changes (Kinnucan *et al*., 1993; Kleppe *et al.,* 2002; Leek *et al.,* 2000; Sayın *et al.,* 2010; Spinks and Bose, 2002; Trondsen *et al.,* 2003; Verbeke *et al.,* 2007).

Through determining these factors by the way of questionnaire, this study aimed to clarify the fish consumption habits and preferences in Trabzon province of Turkey. Finding out the existing problems about consumption, new studies will be conduct to solve these problems

and increase the consumption year long. These data will both elucidate the factors effective on consumption behaviours and make possible to obtain necessary data for related ministries for developing strategies and policies for fisheries, aquaculture, processing and marketing activities.

Material and Method

Main material of the study constitutes original data obtained from individuals living in Trabzon City center, and six districts; Akçaabat, Vakfıkebir, Tonya, Of, Çaykara and Maçka. These centers were chosen to represent coastal and inland settlements (Figure 1).

To calculate the necessary number of respondents, TUIK (2012b) population data were used. Random sampling formula was used to determine the appropriate sample size. In the calculation, 95% confidence limits and variance 0.21 (0.3x0.7) were used as in cases where different main mass sizes for the sample sizes of the information in accordance with population 500.000 and above (Kurtuluş, 2004). Accordingly, calculated total sample number was 322. However, some districts falling poll numbers to be applied statistical techniques in terms of actual numbers is not deemed sufficient for the planned number was changed. Then the number of sample size increased to 400 those yielding total 390 valid questionnaires. Respondents were chosen randomly.

As known, the credibility of any survey depends strongly on the design and the development of the questionnaire. As a result, it is crucial to prepare a wellbalanced questionnaire that meets the necessary requirements of situation scientifically. Based on the scientific infrastructure and previous experiences on questionnaires on seafood consumption studies, questionnaire was formed under the control of two specialists. Twenty seven questions, including general fish preferences, consumption frequencies, processed fish preferences, meal amounts, preparation methods, etc., and demographic characteristics (gender, age, education and monthly income), were prepared to ask respondents. In relation with these questions it was established some hypotheses to evaluate how demographic properties of participants effect the fish consumption patterns. These hypotheses were tested by chi-square, Kruskal-wallis, one-way Anova and correlation techniques with significant level 5% and confidence 95%. Some of the questions were closed-ended questions and some were Likert scale questions that participants indicated their degree of agreement with each attitude statement on five

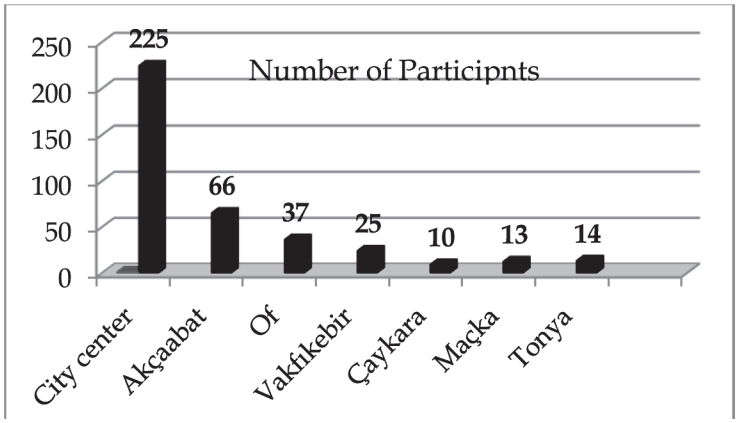

Figure 1. Number of participants questioned in districts and the city center of Trabzon Province. Turkey.

point scale (strongly agree = 1, agree = 2, slightly agree = 3, disagree = 4, strongly disagree =5). Other group of questions asked the importance degree of statement (not important, a little important, moderately important, quite important, and very important). Prior to main study, a pre-test research was applied to 50 individuals with the purpose of testing the understandability, simplicity and relevance of the questions. According to the results obtained, some alterations were made on questionnaire.

Corrections were made after elimination process of data and information. After that, compliances with normal distributions were investigated. Variables that will be basis for analyzes, were coded. In addition, a preliminary study was carried out to determine which statistical techniques will be applied to which variables.

Results

Demographic characteristics of participants who were chosen randomly and involved in the study were given in Table 1.

The overall sample consisted of 390 individuals were calculated as 247 (63.3%) men and 143 (36.7%) women. The educational statutes of the participants were 54.9%

Table 1. Demographic characteristics of respondents (n=390)

	Frequency	%
Gender		
Man	247	63.3
Women	143	36.7
Educational Status		
Illiterate	1	0.3
Primary	72	18.5
High school graduate	103	26.4
University	214	54.9
Employment		
Officer	192	49.2
Workers	79	20.3
Tradesmen	42	10.8
Businessman	6	1.5
Farmers	7	1.8
Unemployed	6	1.5
Housewife	34	8.7
Retired	24	6.2
Monthly income		
<1000TL	54	13.8
1000-1999 TL	119	30.5
2000-2999 TL	166	42.6
3000-3999 TL	40	10.3
4000-49999 TL	7	1.8
>5000TL	4	1

26.4% high school and 18.5% primary school. Most of the participants were officers (49.2%) and their monthly income in 2000-2999TL interval (42.6%).

In the scope of consumption characteristics of participants, first of all participants were asked if they consume fish or not and causes of these situations. If they were consumed fish, participants were asked about their fish consumption habits and preferences such as fish consumption frequency and amount, most preferred fish species, farmed fish preferring status, processed fish consumption, cooking methods, preferences of fish purchasing places and conditions. Only 0.8% of individuals didn't eat fish. Main causes of this situation were "no fish consumption habit", "bad smell", "dislike of family members". The agreement level of participants for "no fish consumption" causes given in Table 2.

Sixty two percentages of the participants strongly agree that "it is a healthy food", whereas 2.1% of them strongly disagree that "I can find fish in every season". There was no significant difference between education and fish consumption except "it is a healthy food" and "it is tasty" (P>0.005, P>0.004, respectively). When asked their level of agreement to fish consumption, 62.3% participants strongly agree that "it is a healthy food", whereas 2.1% of them strongly disagree that "I can find fish in every season". There was no significant difference between education and fish consumption except "it is a healthy food" and "it is tasty" (P>0.005, P>0.004, respectively). The agreement level of participants for "fish consumption" causes given in Table 3.

Using results obtained from daily fish consumption values, per capita consumption was calculated as 23kg/year. 97.42% of consumers preferred wild (sea) and (2.58%) aquaculture production (Figure 2) .

Consumers' fish species preferences for the first three orders were anchovy (64.6%), whiting (20.7%) and horse mackerel (14.2%) for wild fish species; trout (64.9%), sea bream (20.7%) and sea bass (14.0%) for aquaculture fish species, respectively (Figure 3).

Fish market (58.1%) was the first preference for fish purchasing place, it was followed by retail outlets (22.5%) and peddlers (14.5%) (Figure 4).

The first priority to the preferences of participants in cooking methods was frying (60.5%). It was followed by steaming (22.5%). Other participants gave their first priority as grill and baked methods. Second priority to the preferences of participants in fish cooking

Table 2. The agreement level of participants for "no fish consumption" Strongly agree =1►…2►… 3►…4►strongly disagree =5

	1		2		3		4		5	
	F	%	F	%	F	%	F	%	F	%
Difficulty in preparation	1	0,3	2	0,5	-	-	-	-	-	-
Not tasty	1	0,3	1	0,3	-	-	1	0,3	-	-
Not satisfied	1	0,3	-	-	1	0,3	1	0,3	-	-
Cannot find fresh product	1	0,3	-	-	1	0,3	1	0,3	-	-
Expensive	1	0,3	-	-	-	-	2	0,5	-	-
Cannot find every season	1	0,3	1	0,3	-	-	1	0,3	-	-
No fish consumption habit	2	0,5	1	0,3	-	-	-	-	-	-
Bad smell	2	0,5	1	0,3	-	-	-	-	-	-
Family doesn't like	2	0,5	-	-	-	-	1	0,3	-	-
Difficulty in eating because of fish bone	2	0,5	1	0,3	-	-	-	-	-	-

method was steaming (35.8%), grill (23.9%) and frying (22.8%) and other participants stated their second priority as oven and electric grill methods (Figure 5).

39.02% of participants consume processed fish that salted fish (38.4%) took the first place among processed fish and 60.98% of participants don't consume processed fish. Other processed products and their consumption were canned fish (34.4%), frozen fish (25.2%) and smoked fish (2.0%) (Figure 6).

Occupation make significant difference ($P<0.05$) on processed fish consumption patterns. Fish consumption places (Figure 7) were significantly differed ($P<0.005$) between men and women; men (205 individuals) usually choose eating at home, women (12) on contrast prefer at restaurants. This can be express by the bad smell and cleanliness concern of women.

Discussion

World per capita fish consumption have showed a continuously increase from 12.60 kg in 1980 to 14.40 kg in 1990; 17.00kg in 2000 and 18.60 kg in 2010 (FAO, 2012). But in Turkey, these values were 7.51 kg in 1980; 9.75 kg in 1995; 7.98kg in 2000 and 6.33kg in 2011 (TUIK, 2012a). Increasing aquaculture production cause increasing in the consumption values in Turkey. It was found to be a statistically strong corrolation between anchovy production and the consumption ($r = 0.60$; $P \leqslant 0,05$) (Saygı *et al.,* 2015). Similarly, in the Black Sea, abundance and cheapness of caught of small

Table 3. The agreement level of participants for "fish consumption"Strongly agree =1►…2►…3►…4►strongly disagree =5

	1		2		3		**4**		**5**	
	F	%	F	%	F	%	F	%	F	%
Easy to prepare	69	17,7	167	42,8	85	21,8	57	14,6	9	2,3
Tasty	190	48,7	182	46,7	7	1,8	6	1,5	2	0,5
Healthy food	243	62,3	134	34,4	6	1,5	-	-	4	1,0
Satisfactory	180	46,2	158	40,5	43	11,0	5	1,3	1	0,3
It is a good meal	182	46,7	162	41,5	38	9,7	4	1,0	1	0,3
Prices proper	43	11,0	102	26,2	169	43,3	67	17,2	6	1,5
Can be found every season	44	11,3	103	26,4	159	40,8	72	18,5	8	2,1
Prepared variously	117	30,0	222	56,9	41	10,5	4	1,0	3	0,8
I know the origin	65	16,7	188	48,2	103	26,4	25	6,4	6	1,5
Alternative to red meat	110	28,2	146	37,4	65	16,7	58	14,9	8	2,1

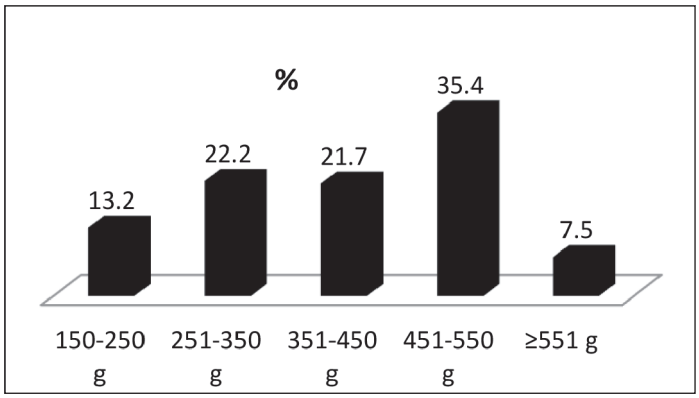

Figure 2. Daily average consumption of fish.

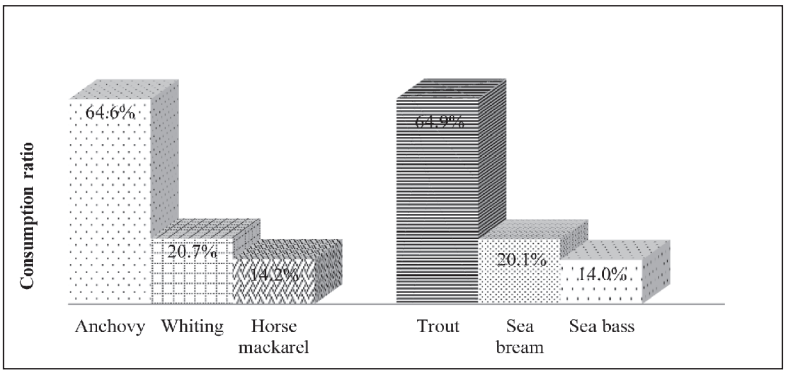

Figure 3.Wild and cultured fish consumption ratio of participants.

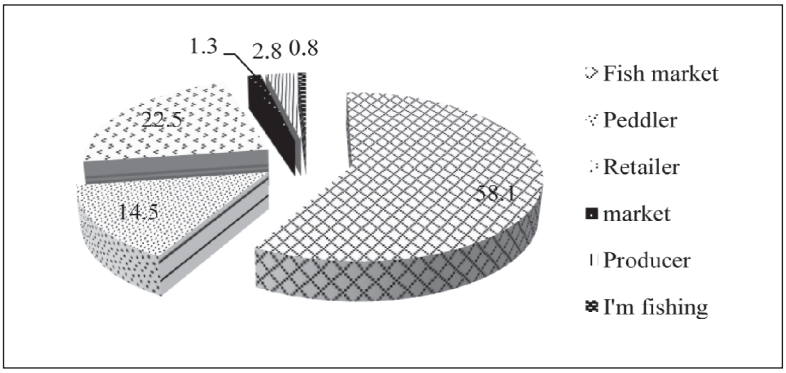

Figure 4. Purchasing places of fish (%).

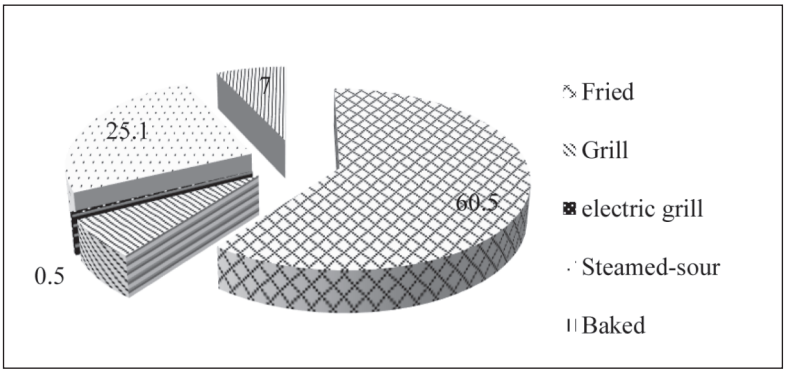

Figure 5. Cooking methods.

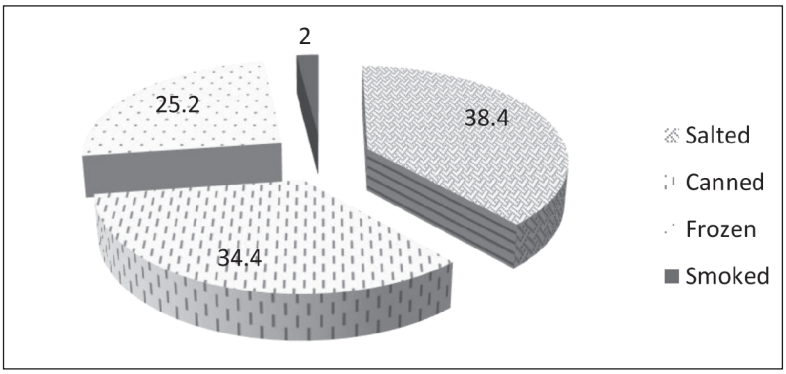

Figure 6. Processed fish Consumption (%).

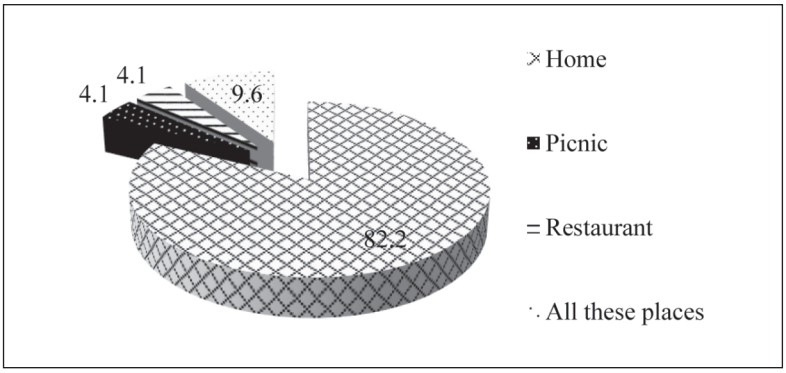

Figure 7. Fish consumption places (%).

pelagic fish species such as anchovy and horse mackerel leads to consume a higher percentage in this region (Aydın and Karadurmuş, 2012).

In this study, a face to face questionnaire applied to people that average age was 35.6 years. This average is convenience with the general average age distribution of Turkey in 2012 as 32.6 (TUIK, 2012b).

But, gender distribution (63.3% men; 36.7% women) demonstrates a bias when compare with the province population (49.4% men; 50.6% women). The education level of the consumers (54.9% university, 26.4% high school and %18.5 primary school) of the study were also inconvenience with general status of the province since generally educated people were more willing to involved in this survey.

According to the study results most of the consumers was consumed fish except 0.8%. A study conducted in Istanbul Province by Eygi Erdoğan *et al*., (2011), investigated the factors influencing the seafood consumption, only 15.5% of the participants stated that they do not consume fish because of "bed smell" and "odor". Orhan and Yüksel, (2010) determined fish consumption habits in Burdur, Turkey, 11.7% of their participants stated that they do not consume fish; 60.6% of these participants gave reason for this situation as "odor", 12.1% "no fish consumption habit of family". Trondsen *et al.,* (2004) also indicated that fishy odor is an important factor for eating less fish. Our results were similar to these previous results.

In our study "health concerns" and the "taste" were the most effective causes to consumption. Participants whose education levels were university, agreed much strongly to these two agreements then participants with lower educational levels. There was no significant difference between education and fish consumption except "it is a healthy food"

and it is tasty" (P>0.005, P>0.004, respectively). Recommendations about healthy eating, shown to influence consumers' food related beliefs and consumption patterns (Harel *et al.,* 2001; Nayga, 2000). There is a positive relationship between seafood consumption and products with healthy components (Foxall *et al.,* 1998). Çolakoğlu *et al.,* (2006) found that however educated participants were not significantly differed from others, their fish consumption preferences much more effected from health concerns then other reasons.

Daily average consumption was found 250-550g in general, 7.4% of the participants stated that they consume 551g fish and above for a meal (Figure 2). As a result of the tests performed to determine gender and fish consumption amounts/meal, there was a significant difference (P<0.05), between gender and amount/meal; when men (113 individuals) eat 451g and over/meal, women (68 individuals) eat only 251-350g/meal. There was significant difference (P<0.005) found between populations living in seaside and inland areas; population living seaside consume more fish than inland areas. Many researchers found out that fish consumption may influenced by different factors like species of fish, season, nutritional value, sensory properties, price, health related aspects, convenience, availability, catching origin, product form (fresh, frozen, salted etc.) obtaining origin (wild or farmed).

Also demographic differences (gender, age, education level, occupation, monthly income) effect to the consumption preferences.

Above mentioned factors may be changed due to regions. Regions are the key factors on different consumption patterns because every different environment presents different potentials that effect on consumption changes (Myrland *et al*., 2000; Kinnucan *et al*., 1993; Kleppe *et al*., 2002; Leek *et al*., 2000; Sayın *et al*., 2010; Spinks and Bose, 2002; Trondsen *et al*., 2003; Verbeke *et al*., 2007). Myrland *et al*., (2000) determined the seafood consumption in Norway; they gave a detailed picture on how life style factors influence the Norwegian consumption of lean, fat and processed seafood for dinner at-home. They stated "substantial regional differences in Norwegian seafood market based on the availability of fresh local seafood species". There are particularly noticeable differences between the central regions of Norway, with their high degree of urbanization (consuming mostly fat seafood) and north Norway, with its rural, scattered population pattern (consuming mostly lean and processed seafood).

Average per capita fish consumption was 23kg and this value is well above than consumption in average world consumption (13.8 kg/year). In Turkey most of the fish (77.2%) was caugh from Black Sea (TUIK, 2011). As it mentioned above Trabzon is a coastal city in the Black Sea region and fisheries and aquaculture activities are effected on the consumption habits. Aydın and Karadurmuş (2012), found per capita consumption in Ordu, which is another coastal province in Black Sea Region, as 26.3 kg/year. This value is very close to our results. In another study Aydın and Karadurmuş (2013), found per capita consumption in Giresun and Trabzon as 28.08 kg/year.

Most of the participants (97.42%) preferred to eat wild (sea) fish, and remaining (2.58%) cutured fish. Similar results were also reported in previous studies (Aydın ve Karadurmuş, (2012), 73.2 % in Ordu; Yavuzcan *et al*., (2010), 93 % in Ankara; Orhan ve Yüksel, (2010) 99.2% in Burdur). These results show that Turkish people generally prefer fresh fish consumption. There is a common belief exists in population that natural fish is healthier compare to aquaculture one.

Informing that cultured fish also healthy food source especially occur under controlled conditions, this mistaken beliefs of consumers must be changed. Especially in summer seasons when natural angling banned, people should be directed to consume aquaculture products.

Anchovy and trout were took the first orders for wild and cultured fish species, respectively (Figure 3). The reason of this situation can be express by the fisheries catch values and the appropriate purchasing prices of anchovy.

Fish species preferences significantly differed between settlements; when wild species preferred in coastal areas, culture species and wild trout were preferred in inland areas ($P<0.05$). Especially in inland places individual hunting of natural trout is high, this is effective on the preferences of fish species. According to several studies conducted in inland and coastal provinces of Turkey, anchovy took the first place among preferred fish species around consumers (Hatırlı *et al*., 2004; Akyol and Perçin, 2005; Sarı *et al*., 2000; Adıgüzel *et al*., 2009; Aydın and Karadurmuş 2012; Orhan ve Yüksel, 2010).

Participants purchase fish from fish market, retail outlets and peddlers and other purchasing places (Figure 4). As the improvement of the health concerns such as relationship between health and nutrition, hygienic conditions, people started to purchase their food from healthier places. As a result of analysis carried out to determine relationship between gender and fish purchasing place, only one of the reasons ("be close to home or workplace") was significantly different ($P<0.05$) between genders, there was no significant difference found among other reasons.

Frying was the first preferred cooking method (60.5%); it was followed by steaming (22.5%). Other participants gave their first priority as barbecue and oven methods (Figure 5). Although frying method is not a healthy one because of the taste concerns and the traditional habits was preferred. Higher income groups consumed more steamed/sour or baked fish, on the other hand lover income groups fried or grill. Grill was used by lower income groups especially at the picnic. According to the test results performed to determine gender and cooking methods there was no significant differences ($P>0.5$) between gender and cooking methods.

Salted fish was the main processed fish consumed by participants (39.02%). Salted fish is a traditional food in the Southern Black Sea Region especially people over 50's always keep and eat homemade salted fish at their homes (Figure 6). Other most preferred processed fish were canned and frozen fish. Occupation make significant difference ($P<0.05$) on processed fish consumption patterns. Especially working women and single living participants stated that "it make easy to prepare meal in a short time" "canned fish is a ready to eat food, making life easy". On the other hand, 60.98% of participants said that they don't consume processed fish. Compare to fresh fish, these people believe that processed fish is unhealthy. This belief should be changed by informing and education. It is necessary to encourage people especially women, who are effective on their children, to consume processed fish besides fresh fish. So consumers can eat fish out of fishing season. Also it will be possible to encourage children to eat fish in different forms such as fish ball, fish burger, etc.

By this way fish consumption per person can be increased. These requirements also underlined by several other researchers (Erdal and Esengül, 2008; Aydın and Karadurmuş, 2013; Saygı *et al.,* 2015).

Fish consumption places (Figure7) were significantly differed ($P<0.005$) between men And women; men (205 individuals) usually

choose eating at home, women (12) on contrast prefer at restaurants. This can be express by the bad smell and cleanliness concern of women.

Myrland (1998) determined that there was no difference between the genders regarding sea-food consumption levels in Norwegian households. Nayga and Capps (1995) observed the same relation in the US food at home market for seafood and shell-sea food. Cardoso *et al.* (2013) studied the topic "Survey into the seafood consumption preferences and patterns in the Portuguese population. "Gender and regional variability" they found that Portuguese consumers prefer wild fish to cultured fish as well as fat fish to lean fish and coastal population prefer wild fish. Also they observed that many women abhor preparing fish because they are typically grilled and such culinary treatment generates much smoke and unpleasant smell, very inconvenient for indoor cooking. One of the parameters of their study was regional differences; population living in inland areas were less attracted to wild fish, a large fraction of populations living in these areas consumed more aquaculture products, in that monthly meals of sea bream and sea bass, 61.7 and 52.4%, respectively, whereas coastal populations exhibit lower consumption frequencies of farmed fish species, such as, gilthead sea bream and sea bass.

As a result in order to support and increase fish consumption year-long, effective information plans and strategies should be developed for public and especially women who are effective on children and teenage nutrition. Specific importance should be given to the health concern, preventive and therapeutic effects on diseases should be impressed.

Besides, wild fish aquaculture and processed fish products also should be encouraged to consume. Most of the respondents believed that fish is a healthy food source and they remarked that if fish became easily available consumption frequency will be increase. Taking into consideration this situation, seafood sector should supply more fish products that can be found in the markets not only in fisheries season but also all year round by producing processed fish products. More attractive products that make children willing to eat. Nowadays it is obvious that time saving products are very useful when it is given that many women work outside home. Processed fish products will be very convenient to easy prepare.

Acknowledgement

This study was supported by Eastern Black Sea Development Agency (DOKA) Technical Support Project with Reference Number: TR90/13/TD04/115.

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