Investigation of Consumer Behavior in terms of Seafood Consumption: Mersin Province Example

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Abstract

Seafood products are valuable nutrients in healthy nutrition in terms of proteins, vitamins, minerals, and omega fatty acids. This study was conducted by face-to-face survey method between April-May 2017 on 1214 people in Akdeniz, Mezitli, Toroslar, and Yenişehir districts of Mersin province to determine consumer behaviors related to aquaculture products, taking into account gender, age, income, employment and education status and the number of people living at home. Data were analyzed by a series od chi-squared tests using SPSS 20 statistical package. Results of the present study revealed that 47% of people living in Mersin preferred red meat, 37.9% fowl meat, and 13.7% fish meat. Most consumed fish species by the survey participants were anchovy (24.7%), sea bream (23.3%), sea bass (20.4%), red mullet (11.2%), pilchard (7.4%), trout (4.9%), smelt (1.9%), mullet (1.7%) and other species (4.4%). Fish was consumed fresh by 94.3 % of the surveyors and that 45.5 % of the consumption was throughout the year and 44.3 % in winter. Most people preferred fried fish (49.7%), and the consumption frequency of 33.2% of surveyors was once a month. According to sexes, 27.3% of the women and 22.3 % of males consumed anchovy most. The highest percentage of people consuming fish (15.4%) was above the age of forty-five. 33.4% of the educational groups consumed fish once a month, fish consumption were once a week (30.5%) in public workers and once a month (31%) in private sectors. Fish preference of income groups were as follows; 1000-1500 TL anchovy (41.7%), 2000-2500 TL anchovy + sea bream (24.3%) and over 3000 TL sea bass (32.2%). The consumption rate of seemed to be lower than expectation in Mersin City keeping its aquatic product potential in mind. Hence it was concluded that aquatic product consumption habits should be given to children and youth and introductive and encouraging steps should be taken for its sustainability.

1. Introduction

As a biological creature, humans must first solve the problem of nutrition in order to fulfill their vital functions. The condition of being able to obtain the protein, vitamins and minerals needed for the human body through plants and animals naturally depends on the existence and sustainability of living species other than itself. A healthy and balanced human diet requires a certain amount of animal protein intake. Red meat and poultry meat, which are among the products of animal origin, have recently led people to consume seafood products due to negative reasons such as chemicals, hormones and concerns of carrying various diseases in the breeding of these animals, and here, due to the concern of shellfish being exposed to heavy metals, it leads people to consume pelagic fish in general

consumption (Temel, 2014). Nowadays, the importance of a balanced diet, not only satiating the consumers, has been recognized, and it has become an important issue in people's food preferences for the growth, development and healthy life of the individual and to protect them from diseases (Çadır, 2012).

Human beings, who have provided their nutritional needs as hunters or gatherers for a long time in their history, started to consume aquatic products as a different substitute for nutrition by using the hunting method to meet this need (FAO, 2016). Fish, which is mobile and mobile in its natural environment, is a good food source for humans as a species that sometimes travels long distances and generally does not belong anywhere until it is caught, not counting the part that is cultivated (Eurostat, 2016). It has been reported by the Food and Agriculture Organization of the United Nations (FAO) that seafood products, especially fish, which have been hunted and consumed for thousands of years, support the human need for nutrition due to many reasons, especially the increasing population and problems in urbanization, and for this reason, the importance of aquaculture products, is increasing day by day (FAO, 2016). Fishing, which today has turned into a major industry, developed economically in the XVth century when it was traded in various parts of the world and in the following centuries. Along with the catching of fish, the stages of processing these products, large fishing boats equipped with different technological devices have led to the formation of large organizations in the sector. In the course of time, overfishing has negatively affected fishing as a sector, and it has also become a problem that needs to be emphasized with the pollution and deterioration of the ecosystem (Yazıcıoğlu, 2015).

Uncertainties in economies, climate changes and the increasing world population have accelerated the efforts for sustainable development in economic, social and environmental terms by the states affiliated to the United Nations regarding the possible problems that will be experienced in the nutrition of people in the near future (FAO, 2016). Both the inadequacy of terrestrial food resources in the face of a rapidly growing population and the decrease in the areas where these resources will be obtained due to reasons such as unplanned urbanization and industrialization make it necessary to use aquatic environments in the fields of hunting and aquaculture in order to solve nutritional problems, but there is a need to strengthen the management of the increasing use of water resources and areas in terms of ecosystem in order to avoid new problems in the future. While the coordination of aquaculture activities carried out in aquatic environments needs legal frameworks in terms of sustainability of aquaculture, the coordinated work of all sectors operating in aquaculture will contribute to the governance of this field, addressing the economic and social goals of countries, while also strengthening sustainability goals through the protection of ecosystems and biodiversity.

The importance of aquatic products has increased as terrestrial resources have decreased due to various reasons and faced with the risk of extinction. The seafood sector, both in terms of hunting and aquaculture, has become a developing sector in terms of feeding people

and ensuring their livelihoods. Experts emphasize the importance of oceans, marine environments, and inland water resources in feeding the world's population today and in the future (FAO, 2016). As an example, aquaculture, which accounted for less than 10% of human consumption in the 1970s, accounted for about 25% in the mid-1990s, while the share of human consumption through aquaculture reached 40% in the mid-2000s. In world aquaculture, China alone has reached a production power of up to 60% (FAO, 2016). We can think of aquaculture as encompassing many subjects, such as animal and plant creatures living in the sea and inland waters, cooperatives, remote sensing, preservation and marketing of cold and frozen products, processing facilities, shipbuilding, coastal and offshore fisheries, and all activities in the sector and the research, development, and training issues of these activities (Yazıcıoğlu, 2015). In fact, data on agricultural activities and the consumption of seafood products are available by utilizing the information on production in these areas. What should be the case is that data on consumption should be calculated and interpreted entirely through consumption surveys.

In order to meet this need, this study aims to determine the behaviors of individuals in Mersin province towards the consumption of seafood products. In more detail, this study aims to determine the consumption preferences of individuals living in Mersin province and the extent to which these preferences are related to gender, age, education level, occupation, income level, and number of households. In this context, in the current study, first of all, the production, consumption, and economy of seafood products in the world, Europe, and Turkey; the individual, society, and consumption culture that shape consumption and consumption, and based on this, a general evaluation of consumption preferences in our country, and then sharing and evaluating the findings obtained with the current study.

2. Method

The study population consists of individuals living in Mersin city center. Mersin province center consists of Akdeniz, Mezitli, Toroslar and Yenişehir districts and the total population of these districts in 2017 was announced as 1.055.455 people by TURKSTAT (2018). This study was conducted to determine the preferences of individuals residing in Mersin province, which is located in the east of the Mediterranean Sea and which is not unfamiliar with marine culture and seafood, towards seafood and to what extent these preferences are related to demographic characteristics such as gender, age, occupation, income level, number of households and education level. The sample of the study consists of a total of 1214 individuals selected from adult individuals living in Mersin city center, and the sampled individuals were obtained by random sampling method.

The data were obtained in April and May 2017 through the questionnaire form conducted by the study group on the basis of face-to-face interview method with 1214 people included in the sample study. In the research, a questionnaire form consisting of 26 questions

was designed and applied to determine the level of awareness of the people living in Mersin city center about the importance of consumption of aquaculture products and the consumption status of aquaculture products, based on the assertion that the issue should be addressed in its entirety, especially the factors that negatively affect the consumption of aquaculture products, and the factors affecting consumption should be identified and solutions should be produced to these problems. The literature was reviewed in the creation of the statements and questions in the questionnaire form, and the final form of the questionnaire was finalized by taking the opinion of two experts in the field.

In the first part of the questionnaire form, the demographic characteristics of the individuals and their fish meat consumption status were examined. The 6th question of the questionnaire form was prepared as open-ended, and individuals were asked, "What is the first thing that comes to their mind when they think of seafood products?". In terms of the conceptual framework of the research, other issues such as the factors determining the tendencies of consumers in the consumption of aquatic products, consumption habits, cooking methods while consuming aquatic products, factors determining the purchase of aquatic products by the consumer, preferences for fish and other aquatic products other than fish in consumption, and tendencies towards the consumption of farmed fish were investigated. Specifically, the effect of gender, age, education level, occupation, and income levels on the consumption of seafood products on the respondents in Mersin city center was tried to be determined.

The analysis of the data of the study was carried out with the SPSS 20 statistical package program. In the questionnaire study, firstly, the percentage and frequency values of the data obtained were determined. Chi-square analysis was performed to determine the effect of gender, age, income level, occupation and education level and the number of people living in the household on the attitudes and behaviors of consumers towards aquaculture products. One of the most important assumptions of the Chi-square test is that the number of cells with a value below 5 should not exceed 20% of the total number of cells. In cases where the number of pores exceeds 20%, it is not correct to interpret the results of the significance test (Demir, 2012). Therefore, while presenting the findings of the study, cross-tabulations were created for the results that did not meet this assumption, and the data were presented using descriptive statistical methods. The degrees of freedom and significance levels of the Chi-square test results that meet the assumption are given, and whether there is a statistically significant interaction between the variables investigated is interpreted and reported.

3. Results

In this study, in order to determine the effect of gender, age, income level, occupation and education level and the number of people living in the household on the attitudes and behaviors of consumers towards aquaculture products, the results of the frequency

analysis of the survey data applied using face-to-face interview method with 1214 randomly selected individuals from Akdeniz, Mezitli, Toroslar and Yenişehir central districts of Mersin province in April-May 2017 are presented. It was determined that 49% of the individuals participating in the survey were female and 51% were male, and in terms of age distribution, 30.7% of the respondents were in the age group of 45> and above. Regarding the educational status of the respondents, the highest rate is 45.9% for bachelor's degree graduates and the lowest rate is 1.1% for illiterates. Public sector employees (32%), private sector employees (28.5%), students (14.0%), housewives (13.2%) and pensioners (12.3%) participated in the survey respectively. 22.1% of the respondents were from the highest income group and 21.1% were from the lowest income group. The group with the lowest income level was the second group with the highest participation in the survey. Of the respondents, 30.3% live in households with four, 29.6% in households with three, 18.7% in households with two, 12.1% in households with five, 5.3% in households with one, and 4.0% in households with six or more members.

71.66% of the participants answered that the first thing that comes to mind when it comes to seafood is fish, while 12.19% answered sea creatures. The individuals who participated in the survey stated that they consume red meat with 47.0% and poultry meat with 37.9%. Fish consumption preference ranked third with 13.7% and other seafood consumption ranked fourth with 0.8% (Table 1).

Table 1. Consumption preferences of respondents according to meat type.

Type of Meat Consumed	f	%
Red meat	569	47,0
Poultry meat	459	37,9
Fish	166	13,7
None of them	10	0,8
Other aquaculture products	7	0,6
Total	1211	100

It was determined that 48.0% of the participants found fish prices normal, 34.3% found them expensive and 10.8% found them cheap. The frequency of fish consumption was found to be once a month (33.2%), once every fifteen days (24.2%), once a week (22.3%), once or twice a year (8.3%), more than once a week (7.0%), and not consuming (4.9%), respectively. The highest reason for not consuming fish in the group that reported not consuming fish was odor (35.5%), followed by lack of habit (32.3%), difficulty in cleaning (9.7%), taste (9.7%) and other reasons (12.9%). In the group that preferred fish consumption, 61.0% of the respondents said "being healthy", 19.7% said it was delicious, 16.2% said it was nutritious, 1.0% said it was cheap and 2.0% said other reasons. 63.9% of the participants stated that they had sufficient information about the importance of fish consumption, while 36.1% stated that they did not.

In terms of the place where the fish is purchased; 33.0% supermarket, 30.5% market, 29.5% fish market, 3.8% other and 3.2% catching the fish myself. It was

determined that consumers paid the most attention to the freshness of the fish (84.3%), the price of the fish (5.8%), the flavor of the fish (3.8%), the cleanliness of the place where the fish was bought (3.6%), other (1.8%) and the way the fish was cooked (0.8%). Participants stated that they paid attention to the fishing ban (54.0%) and fish size (45.9%) when purchasing fish. While 71.8% of the individuals who participated in the survey reported that they consumed the fish immediately after buying, 13.3% the next day, 12.7% within a week, 1.5% within a month, and 0.7% gave the answer "other". 52% of the participants stated that they store the fish in the refrigerator, 20.1% in the freezer, 15.9% in the open and 12.0% in the deep freezer until consumption.

The most consumed fish species in the city were anchovy (24.7%), sea bream (23.3%), sea bass (20.4%), red mullet (11.2%), sardine (7.4%), trout (4.9%), lizardfish (1.9%), mullet (1.7%) and other (4.4%) (Table 2).

Table 2. Most consumed fish species.

Which fish do you consume the most?	f	%
Anchovy	297	24,7
Sea bream	280	23,3
Sea bass	245	20,4
Red mullet	134	11,2
Sardine	89	7,4
Trout	59	4,9
Other	53	4,4
Lizardfish	23	1,9
Mullet	21	1,7
Total	1201	100

The monthly consumption amount of aquaculture products in their households was determined as 1-3 kg at the highest rate (63.2%), followed by 4-6 kg (27.2%), 6-10 kg (5.6%), over 10 kg (2.0%), and those who did not consume any aquaculture products (2.0%) (Table 3).

Table 3. Monthly consumption of seafood products in the households of the participants

Monthly consumption of seafood in your household	f	%
Nothing	24	2,0
1-3 kg	761	63,2
4-6 kg	328	27,2
6-10 kg	67	5,6
Over 10 kg	24	2,0
Total	1204	100

Participants stated that 44.3% preferred to consume seafood in winter, 5.1% in summer, 3.7% in autumn, 1.4% in spring, while 45.5% responded that it did not matter. In terms of consumption type, 94.3% prefer fresh, 1.8% frozen, 1.8% canned, 0.7% salted, 0.5% pickled and 0.9% other. The individuals who participated in the survey stated that they consume fish mostly by frying (49.7%), grilling (29.3%), oven (15.3%), steaming (4.9%), while 0.8% stated that they prefer other cooking methods.

734 of the participants stated that they mostly consume mussels (36.4%), squid (29.8%), shrimp (21.0%), lobster (1.2%), octopus (1.1%) and other seafood (10.5%). Of the 77 respondents who answered "other", 56 of them stated that they prefer crab consumption.

In terms of processed fish meat consumption, 83.8% of the respondents stated that they prefer canned fish, 4.0% lakerda, 3.9% smoked fish, 3.6% fish balls and 3.1% fish croquettes. While 44.6% of the participants responded positively to the consumption of cultured fish, 55.4% stated that they did not consume cultured fish. It was determined that the participants preferred fish consumption at home (82.7%), restaurant (14.3%), picnic (1.4%) and buffet (1.2%), respectively.

Fish meat consumption among the participants was determined as 12.5% for women and 14.9% for men. According to descriptive statistics, 45% of women and 48.9% of men consume red meat (Table 4).

Table 4. The relationship between participants' gender and meat consumption preferences

Which meat do you consume the most?	women		men		Total	
	f	%	f	%	f	%
Fish	74	12,5	92	14,9	166	13,7
Red meat	267	45,0	302	48,9	569	47,0
Poultry meat	242	40,8	217	35,1	459	37,9
Other seafood	3	0,5	4	0,6	7	0,6
None of them	7	1,2	3	0,5	10	0,8
Total	593	100,0	618	100,0	1211	100,0

When the preference for the type of fish consumed was compared according to gender, no statistically significant relationship was found according to the results of the Chi-Square test of independence, $(X2 (8)=14.64, p>0.05)$. According to the results of descriptive statistics, the types of fish consumed were determined as anchovy and sea bream for both genders (Table 5).

Table 5. The relationship between the gender of the participants and the most consumed fish type

Most consumed fish species	women		men		Total	
	f	%	f	%	f	%
Sea bream	145	24,7	135	22,0	280	23,3
Sea bass	120	20,4	125	20,4	245	20,4
Sardine	39	6,6	50	8,1	89	7,4
Anchovy	160	27,3	137	22,3	297	24,7
Red mullet	59	10,1	75	12,2	134	11,2
Lizardfish	13	2,2	10	1,6	23	1,9
Mullet	5	0,9	16	2,6	21	1,7
Trout	24	4,1	35	5,7	59	4,9
Other	22	3,7	31	5,0	53	4,4
Total	587	100,0	614	100,0	1201	100,0

According to descriptive statistics, the highest consumption of seafood products other than fish are mussels (Women: 36.3%, Men: 36.5%), squid (Women: 31.0%, Men: 28.8%) and shrimp (Women: 19.3%, Men: 22.4%), followed by other seafood products (Women:

12.6%, Men: 8.7%), lobster (Women: 0.3%, Men: 2.0%): 19.3%, Men: 22.4%) and other seafood (Women: 12.6%, Men: 8.7%), lobster (Women: 0.3%, Men: 2.0%), octopus (Women: 0.6%, Men: 1.5%).

According to the results of the Chi-Square independence test, there was a statistical difference in terms of consumption preference of cultured fish depending on gender ($X2$ (1)=8.61, $p<0.05$). It was determined that 48.8% of male participants had a favorable view of aquaculture fish consumption, while 59.7% of female participants had a negative view. Although the Chi-Square test on where men and women consume fish more often (20.0%) provided the basic assumption, no significant relationship was found according to the results ($X2$ (4)=5.20, $p>0.05$). According to the results of descriptive statistics, fish is mostly consumed at home in both gender groups (Female: 84%, Male: 81.5%). In the second place, 12.8% of women and 15.7% of men preferred restaurants.

Chi-Square independence test was applied to determine whether there is a relationship between the meat consumption preferences of individuals in different age groups. When the findings obtained were evaluated as descriptive statistical data, it was found that the group that consumed fish the most was over 45 years of age (18.4%) and the preference for fish consumption decreased due to the decrease in age. The consumption preference for other seafood products was highest in the lowest age group (Table 6).

According to the Chi-Square test of independence, the frequency of fish meat consumption was statistically significant in terms of age groups ($X2$ (20)=75.30, $p<0.05$). Among the age groups that consumed fish meat more than once a week, 36-45 (7.9%) and 45+ age groups (7.5%) were found to be the groups with the highest consumption. The highest frequency of consumption once a week was 36-45 (26.4%), 45> (23.7%), 26-35 (20.8%), <18 (17.8%), 18-25 (15.9%). The highest consumption frequency was determined as once every fifteen days for all age groups. Among the groups, 18-25 years old (14.3%), once or twice a year and <18 years old (22.2%) were the groups that did not consume fish (Table 7).

The Chi-Square independence test result was statistically significant in terms of the preference for the type of fish consumed depending on age ($X2$ (32)=111.05, $p<0.05$. Among all age groups, anchovy was the most consumed fish type with a rate of 24.6%, while mullet was the least consumed fish type with a rate of 1.8%. Individuals under 18 years of age (59.0%) and 18-25 years of age (36.9%) consumed anchovy the most, while individuals aged 26-35 (23.4%) and 36-45 (22.7%) stated that sea bass was the most consumed fish. In the 45+ age group, the most consumed fish type was sea bream (28.2%) (Table 8).

In the statistical evaluation of the consumption preference of seafood other than fish according to age, mussel consumption was found in the <18 (66.7%), 18-25 (59.6%) and 26-35 (39.5%) age groups, while squid consumption was found in the 36-45 (32%) age group, 1) and >45 (38.8%), while shrimp was consumed at higher rates in the 36-45 (27.9%), >45 (23.6%), 26-45 (20.0%), <18 (14.8%) and 18-25 (11.0%) age groups (Table 9).

The relationship between the education level of the participants and their meat consumption preferences was measured by Chi-Square test of independence. According to the descriptive statistics data, the rates of those who prefer fish more than other types of meat (164 people) according to their educational status among the total 1206 people who participated in the survey were determined as 27 people (14.2%) among 190 primary school graduates, 43 people (12.0%) among 359 high school graduates, 77 people (13.9%) among 552 undergraduate graduates and 14 people (15.2%) among 92 postgraduate graduates. Among the 13 illiterate individuals, 3 of them stated that they prefer fish meat primarily. Among all education groups, the proportion of those who preferred fish meat to other meat types was determined as 13.6% (Table 10).

The relationship between the education level of the participants and how often they consume fish meat was examined, and the groups consuming more than one fish per week were found to be undergraduate (7.0%), high school (5.6%) and primary school (4.7%) according to their education level; the consumption frequency of individuals in the postgraduate education group (15.2%) was determined as the highest value among those who consume more than one fish meat per week (Table 11).

The relationship between education level and the place where the fish was purchased was examined, and it was determined that the postgraduate fish market (37.1%), undergraduate supermarket (41.1%), primary school (45.7%) and high school (42.0%) groups preferred the marketplace.

When the relationship between the education level of the participants and the type of fish they consume the most was evaluated, it was determined that the individuals in the primary school (36.5%) and high school (27.9%) education groups consumed anchovies the most, while the individuals in the undergraduate (23.8%) and postgraduate (31.5%) education groups consumed sea bass the most. It was determined that 4 out of 13 people (30.8%) in the illiterate group consumed sea bream.

The relationship between the education level of the participants and the amount of fish consumption of their households was measured by Chi-Square independence test, and the highest proportional distribution of 1-3 kg monthly consumption according to education level was determined as primary education (69.5%), illiterate (69.2%), high school (66.8%), undergraduate (61.8%) and postgraduate (45.7%). The participants who consumed 4-6 kg per month were graduate (44.6%) and undergraduate (29.7%) (Table 12).

When the relationship between educational attainment and the most consumed seafood other than fish was examined, the highest consumption in the primary school (31.5%), high school (45.3%) and undergraduate (35.8%) education groups was mussels. Squid (48.6%) has the highest consumption rate in the postgraduate education group (Table 13).

A statistically significant relationship was found between the education level of the participants and their preference for fish consumption from aquaculture ($X2$ (4)=18.18, $p<0.05$). It was determined that the participants in the primary school (60.6%), high school

(62.8%) and postgraduate school (52.2%) education groups did not prefer consumption, while the undergraduate (50.4%) and illiterate (53.8%) groups preferred consumption.

The relationship between whether the participants had sufficient knowledge about fish consumption and their educational status was statistically significant ($X2$ (4)=31.96, p<0.05). It was concluded that 63.8% of the participants had sufficient knowledge about fish consumption, 79.3% of them had postgraduate education and 54.2% of them were in the primary education group.

54% of the individuals participating in the survey stated that they pay attention to the fishing ban time and fish size. Of these, 76.9% were illiterate, 58.2% were undergraduates, 57.6% were postgraduates, and 52.7% were in the primary education group.

The relationship between the occupation of the participants and the frequency of fish consumption was found to be statistically significant according to the Chi-Square test of independence ($X2$ (20)=100.95, p<0.05). It was determined that people working in the private sector (31.0%), retired (37.6%), student (34.1%) and housewife (46.9%) groups consumed fish "once a month" with the highest rate in response to the question "how often do you consume fish". On the other hand, public sector employees chose "once a week" as the frequency of fish consumption (30.5%). According to the results of the analysis of 1211 people, the highest rates in terms of fish consumption frequency were determined as once a month with a rate of 33.3%, once every 15 days with a rate of 24.4%, while the rate of those who consume fish once a week was 22.4%. In total, the rate of those who consume fish more than once a week was 7.0%, while the rate of those who said they do not consume fish was 4.9% (Table 14).

A statistically significant relationship was found between the occupation of the participants and the place of purchase, ($X2$ (16)=61.78, p<0.05). The private sector (35.9%) and housewife (48.1%) groups preferred the market place in the first place, the public sector (36.5%) and student (39.6%) groups preferred supermarkets, while the retired group preferred both at the same rate (32.2%).

The distribution rates of those who consume 1-3 kg of seafood products per household per month according to occupation are as follows: 64.1% for private sector, 52.6% for public sector, 72.8% for retired, 72.7% for student, 68.6% for housewife. Consumption of 4-6 kg per week ranks second and the highest rate belongs to the public sector with 35.8%, followed by the private sector with 25.5%, housewife with 22.0%, retired with 21.8%, student with 20.6% (Table 15).

The highest preference for consumption of aquaculture products other than fish was mussels for students (62.6%), private sector employees (39.3%), and housewives (34.4%), and squid for public sector employees (37.9%) and pensioners (35.3%). According to the results of the Chi-Square independence test, no significant relationship was found between the occupations of individuals and their preference for aquaculture fish for consumption, although the assumption of the test was met ($X2$ (4)=8.80, p>0.05).

According to the results of descriptive statistics, it was determined that housewives (63.5%), private sector (57.6%), retired (55.4%) and public sector (52.3%) employees did not prefer aquaculture fish consumption, while students (50.6%) preferred aquaculture fish consumption.

When the income level and meat consumption preferences of the participants are analyzed, red meat is preferred at the middle income level and above, while poultry meat is preferred at a higher rate below the middle income level. Fish meat is preferred in third place and there is no significant relationship with income level (Table 16).

According to the Chi-Square test of independence, a statistically significant relationship was found between the income level of the individuals and the frequency of fish consumption, ($X2$ (20)=146.64, p<0.05). The frequency of fish consumption was determined as once every fifteen days at the middle income level (34.8%), once a month at the lower middle income level (44.5%) and once a month at the lowest income level (34.8%). Participants with the highest income level (36.4%) consumed fish once a week (Table 17).

A statistically significant relationship was found between the income level of the participants and the place where the fish was purchased, ($X2$ (16)=38.28, p<0.05). It was determined that those who preferred to buy fish from "supermarket" were; 1000-1500 TL income group (34,5%), 2500-3000 TL income group (35,8%) and income group above 3000 TL (38,1%). The first preference of 1500-2000 TL income group (38.6%) and 2000-2500 TL income group (37.0%) was determined as "marketplace". While the highest rate in the income group that stated "fish market" as the second preference was determined as the income group above 3000 TL (35.8%), it was determined that the least preference of the individuals in this group for the place where the fish was purchased was "marketplace" (17.3%). According to the answers given by a total of 1165 individuals from all income groups to the question "where do you buy fish", the first three places in the total distribution were determined as "supermarket" 33.0% (385 people), "marketplace" 30.4% (354 people) and "fish market" 29.6% (345 people) (Table 18).

The Chi-Square test of independence was applied to measure the relationship between the income level of the participants and the "most consumed fish type" and a statistically significant interaction was found ($X2$ (32)=137.85, p<0.05). According to the results of the analysis, it was determined that anchovy (24.0%), sea bream (23.5%) and sea bass (20.7%) were the most consumed fish species in the groups with low income level. It was concluded that the middle income group consumed anchovy and sea bream at the same rate (24.3%). It was determined that sea bream (26,6%) was consumed in the first place and sea bass (24,3%) in the second place above the middle income level. At the highest income level, sea bass (32.2%) and sea bream (27.6%) were consumed in this group (Table 19).

It was determined that the maximum monthly consumption of seafood was 1-3 kg in all income groups. 40.8% of the participants with the highest income level

stated that they consume 4-6 kg of fish per month (Table 20).

It was determined that the low and middle income groups consumed mussels the most, while the middle and upper income groups consumed squid the most (Table 21).

A statistically significant relationship was found between the income level of the participants and their preference for aquaculture fish consumption, (X2 (4)=10.16, p<0.05). At the highest income level, aquaculture fish consumption is preferred by 52.1%, while aquaculture fish consumption is not highly preferred in other income groups. The relationship between the number of people living in the participants' households and their meat consumption preferences was examined and it was found that the highest preference was for red meat (46.9%), poultry meat (38.0%) and fish meat (13.7%). It was found that the rate of fish and red meat consumption decreased as the number of people living in the participants' households increased.

A statistically significant relationship was found between the number of people living in the participants' households and the frequency of fish consumption (X2 (25)=66.79, p<0.05).Among the groups of the number of people living in the participants' households, the frequency of fish consumption was determined to be once a month. The group ratios of the rate of fish consumption once a month according to the number of households are as follows: while the rate was 29.7% in one-person households, the rate was 38.3% in two-person households, 34.4% in three-person households, 31.3% in four-person households, 27.4% in five-person households, and 37.5% in households with 6 or more persons.

The relationship between the number of people living in the households of the participants and the most consumed fish species was determined. It was found that the consumption of anchovy increased as the number of people in the household increased. Households with two and three persons consume sea bream and sea bass respectively. In terms of monthly consumption of aquaculture products, the highest rate is 1-3 kg. This rate decreased due to the increase in the number of people in the household. Consumption of 4-6 kg per month ranked second. This consumption is highest in households with 4 persons. There was no statistically significant relationship between the number of people living in the participants' households and their preference for farmed fish consumption (X2 (5)=7.30, p>0.05). While consumption of farmed fish was highly preferred in single-person households, it was not preferred in other groups.

Table 6. The relationship between participants' age groups and meat consumption preferences

Most consumed meat type	<18		18-25		26-35		36-45		45>		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Fish	4	8,9	18	9,9	35	12,0	41	12,9	68	18,4	166	13,8
Red meat	19	42,2	74	40,9	134	45,9	170	53,3	170	45,9	567	47,0
Poultry meat	20	44,4	86	47,5	117	40,1	105	32,9	129	34,9	457	37,9
Other seafood	2	4,4	0	0,0	2	0,7	1	0,3	2	0,5	7	0,6
None of them	0	0,0	3	1,7	4	1,4	2	0,6	1	0,3	10	0,8
Total	45	100,0	181	100,0	292	100,0	319	100,0	370	100,0	1207	100,0

Table 7. The relationship between different age groups and frequency of fish consumption

Frequency of fish consumption	<18		18-25		26-35		36-45		45>		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
More than once a week	1	2,2	12	6,6	19	6,5	25	7,9	28	7,5	85	7,0
Once a week	8	17,8	29	15,9	61	20,8	84	26,4	88	23,7	270	22,3
Every fifteen days	10	22,2	39	21,4	74	25,3	88	27,7	82	22,1	293	24,2
Once a month	11	24,4	58	31,9	102	34,8	93	29,2	136	36,7	400	33,1
Once or twice a year	5	11,1	26	14,3	19	6,5	21	6,6	30	8,1	101	8,4
I do not consume	10	22,2	18	9,9	18	6,1	7	2,2	7	1,9	60	5,0
Total	45	100	182	100	293	100	318	100	371	100	1209	100

Table 8. The relationship between the age groups of the participants and the type of fish consumed

Most consumed fish species	<18		18-25		26-35		36-45		45>		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Sea bream	1	2,6	33	18,4	66	22,7	76	23,8	104	28,2	280	23,4
Sea bass	6	15,4	23	12,8	68	23,4	80	25,1	68	18,4	245	20,5
Sardine	1	2,6	11	6,1	31	10,7	21	6,6	24	6,5	88	7,4
Anchovy	23	59,0	66	36,9	62	21,3	66	20,7	78	21,1	295	24,6
Red mullet	0	0,0	10	5,6	30	10,3	45	14,1	49	13,3	134	11,2
Lizardfish	0	0,0	4	2,2	6	2,1	5	1,6	8	2,2	23	1,9
Mullet	2	5,1	3	1,7	6	2,1	4	1,3	6	1,6	21	1,8
Trout	5	12,8	20	11,2	13	4,5	9	2,8	11	3,0	58	4,8
Other	1	2,6	9	5,0	9	3,1	13	4,1	21	5,7	53	4,4
Total	39	100,0	179	100,0	291	100,0	319	100,0	369	100,0	1197	100,0

Table 9. The relationship between age groups of the participants and consumption of other seafood products

Most consumed seafood other than fish	<18		18-25		26-35		36-45		45>		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Mussel	18	66,7	81	59,6	79	39,5	48	25,3	40	22,5	266	36,4
Shrimp	4	14,8	15	11,0	40	20,0	53	27,9	42	23,6	154	21,1
Calamari	4	14,8	26	19,1	58	29,0	61	32,1	69	38,8	218	29,8
Octopus	0	0,0	2	1,5	1	0,5	2	1,1	3	1,7	8	1,1
Lobster	0	0,0	1	0,7	3	1,5	2	1,1	2	1,1	8	1,1
Other	1	3,7	11	8,1	19	9,5	24	12,6	22	12,4	77	10,5
Total	27	100,0	136	100,0	200	100,0	190	100,0	178	100,0	731	100,0

Table 10. The relationship between education level of the participants and their meat consumption preferences

Most type of meat consumed	Primary education		High School		Undergraduate		Postgraduate		Illiterate		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Fish	27	14,2	43	12,0	77	13,9	14	15,2	3	23,1	164	13,6
Red meat	64	33,7	142	39,6	295	53,4	63	68,5	3	23,1	567	47,0
Poultry meat	95	50,0	167	46,5	176	31,9	14	15,2	6	46,2	458	38,0
Other seafood	1	0,5	4	1,1	1	0,2	0	0,0	1	7,7	7	0,6
None of them	3	1,6	3	0,8	3	0,5	1	1,1	0	0,0	10	0,8
Total	190	100	359	100	552	100	92	100	13	100	1206	100

Table 11. The relationship between participants' education level and frequency of fish consumption

Frequency of fish consumption	Primary education		High School		Undergraduate		Postgraduate		Illiterate		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
More than once a week	9	4,7	20	5,6	39	7,0	14	15,2	1	7,7	83	6,9
Once a week	27	14,2	60	16,7	149	26,9	32	34,8	2	15,4	270	22,4
Every fifteen days	28	14,7	91	25,3	148	26,7	23	25,0	1	7,7	291	24,1
Once a month	86	45,3	142	39,6	149	26,9	19	20,7	7	53,8	403	33,4
Once or twice a year	30	15,8	28	7,8	39	7,0	2	2,2	2	15,4	101	8,4
I do not consume	10	5,3	18	5,8	30	5,4	2	2,2	0	0,0	60	5,0
Total	190	100	359	100	554	100	92	100	13	100	1208	100

Table 12. The relationship between the education level of the participants and their monthly consumption of seafood

Monthly consumption of seafood in the household	Primary education		High School		Undergraduate		Postgraduate		Illiterate		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Nothing.	8	4,2	5	1,4	10	1,8	0	0,0	1	7,7	24	2,0
1-3 kg	132	69,5	235	66,8	341	61,8	42	45,7	9	69,2	759	63,3
4-6 kg	37	19,5	81	23,0	164	29,7	41	44,6	3	23,1	326	27,2
6-10 kg	10	5,3	22	6,2	29	5,3	5	5,4	0	0,0	66	5,5
Over 10 kg	3	1,6	9	2,6	8	1,4	4	4,3	0	0,0	24	2,0
Total	190	100,0	352	100,0	552	100,0	92	100,0	13	100,0	1199	100,0

Table 13. The relationship between education level of the participants and the seafood consumed other than fish

Most consumed seafood other than fish	Primary education		High School		Undergraduate		Postgraduate		Illiterate		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Mussel	23	31,5	92	45,3	135	35,8	14	20,0	3	37,5	267	36,5
Shrimp	19	26,0	37	18,2	80	21,2	17	24,3	0	0,0	153	20,9
Calamari	10	13,7	54	26,6	116	30,8	34	48,6	4	50,0	218	29,8
Octopus	1	1,4	2	1,0	4	1,1	0	0,0	0	0,0	7	1,0
Lobster	0	0,0	1	0,5	6	1,6	2	2,9	0	0,0	9	1,2
Other	20	27,4	17	8,4	36	9,5	3	4,3	1	12,5	77	10,5
Total	73	100,0	203	100,0	377	100,0	70	100,0	8	100,0	731	100,0

Table 14. The relationship between the occupation of the participants and the frequency of fish consumption

Frequency of fish consumption	Private sector		Public sector		Retired		Student		Housewife		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Less than once a week	30	8,7	32	8,3	14	9,4	6	3,5	3	1,9	85	7,0
Once a week	65	18,8	118	30,5	39	26,2	29	17,1	20	12,5	271	22,4
Every fifteen days	95	27,5	97	25,1	32	21,5	31	18,2	38	23,8	293	24,2
Once a month	107	31,0	107	27,6	56	37,6	58	34,1	75	46,9	403	33,3
Once or twice a year	27	7,8	19	4,9	7	4,7	27	15,9	20	12,5	100	8,3
I do not consume	21	6,1	14	3,6	1	0,7	19	11,2	4	2,5	59	4,9
Total	345	100	387	100	149	100	170	100	160	100	1211	100

Table 15. The relationship between the occupation of the participants and the monthly consumption of seafood in their households

Monthly consumption of seafood in the household	Private sector		Public sector		Retired		Student		Housewife		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Nothing.	6	1,7	7	1,8	0	0,0	6	3,6	5	3,1	24	2,0
1-3 kg	221	64,1	203	52,6	107	72,8	120	72,7	109	68,6	760	63,2
4-6 kg	88	25,5	138	35,8	32	21,8	34	20,6	35	22,0	327	27,2
6-10 kg	22	6,4	28	7,3	5	3,4	5	3,0	7	4,4	67	5,6
Over 10 kg	8	2,3	10	2,6	3	2,0	0	0,0	3	1,9	24	2,0
Total	345	100	386	100	147	100	165	100	159	100	1202	100

Table 16. The relationship between income levels of the participants and their meat consumption preferences

Most Type of meat consumed	1000-1500 (TL)		1500-2000 (TL)		2000-2500 (TL)		2500-3000 (TL)		3000+ (TL)		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Kırmızı et	80	32,0	109	38,7	98	46,7	101	57,1	169	64,5	557	47,2
Kanatlı eti	134	53,6	132	46,8	78	37,1	46	26,0	55	21,0	445	37,7
Balık	28	11,2	37	13,1	32	15,2	28	15,8	37	14,1	162	13,7
Hiç biri	7	2,8	2	0,7	1	0,5	0	0,0	0	0,0	10	0,8
Diğer su ürünü	1	0,4	2	0,7	1	0,5	2	1,1	1	0,4	7	0,6
Toplam	250	100	282	100	210	100	177	100	262	100	1181	100

Table 17. The relationship between the income levels of the participants and the frequency of fish consumption

The frequency of fish consumption	1000-1500 (TL)		1500-2000 (TL)		2000-2500 (TL)		2500-3000 (TL)		3000+ (TL)		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
More than once a week	11	4,4	19	6,7	12	5,7	12	6,7	31	11,9	85	7,2
Once a week	49	19,6	43	15,2	34	16,2	47	26,3	95	36,4	268	22,7
Every fifteen days	38	15,2	57	20,1	73	34,8	54	30,2	64	24,5	286	24,2
Once a month	87	34,8	126	44,5	70	33,3	50	27,9	62	23,8	395	33,4
Once or twice a year	39	15,6	26	9,2	12	5,7	10	5,6	8	3,1	95	8,0
I do not consume	26	10,4	12	4,2	9	4,3	6	3,4	1	0,4	54	4,6
Total	250	100	283	100	210	100	179	100	261	100	1183	100

Table 18. The relationship between the income level of the participants and the place where the fish is purchased

Where the fish was purchased	1000-1500 (TL)		1500-2000 (TL)		2000-2500 (TL)		2500-3000 (TL)		3000+ (TL)		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Marketplace	72	30,3	108	38,6	77	37,0	52	29,1	45	17,3	354	30,4
Fish market	69	29,0	76	27,1	58	27,9	49	27,4	93	35,8	345	29,6
Supermarket	82	34,5	78	27,9	62	29,8	64	35,8	99	38,1	385	33,0
Individual hunting	7	2,9	9	3,2	3	1,4	6	3,4	12	4,6	37	3,2
Other	8	3,4	9	3,2	8	3,8	8	4,5	11	4,2	44	3,8
Total	238	100	280	100	208	100	179	100	260	100	1165	100

Table 19. The relationship between income levels of the participants and the most consumed fish type

Most consumed fish species	1000-1500 (TL)		1500-2000 (TL)		2000-2500 (TL)		2500-3000 (TL)		3000+ (TL)		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Anchovy	101	41,7	64	22,7	51	24,3	35	19,8	30	11,5	281	24,0
Sea bream	44	18,2	62	22,0	51	24,3	47	26,6	72	27,6	276	23,5
Sea bass	26	10,7	56	19,9	34	16,2	43	24,3	84	32,2	243	20,7
red mullet	12	5,0	40	14,2	32	15,2	20	11,3	28	10,7	132	11,3
Sardine	15	6,2	24	8,5	19	9,0	16	9,0	14	5,4	88	7,5
Trout	26	10,7	12	4,3	5	2,4	6	3,4	8	3,1	57	4,9
Other	10	4,1	12	4,3	12	5,7	6	3,4	12	4,6	52	4,4
Lizardfish	6	2,5	7	2,5	4	1,9	0	0,0	5	1,9	22	1,9
Mullet	2	0,8	5	1,8	2	1,0	4	2,3	8	3,1	21	1,8
Total	242	100	282	100	210	100	177	100	261	100	1172	100

Table 20. The relationship between the income level of the participants and the monthly consumption of seafood in their households

Monthly consumption of seafood in the household	1000-1500 (TL)		1500-2000 (TL)		2000-2500 (TL)		2500-3000 (TL)		3000+ (TL)		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Nothing.	11	4,5	3	1,1	2	1,0	3	1,7	2	0,8	21	1,8
1-3 kg	170	69,7	205	72,4	136	66,0	110	61,5	121	46,2	742	63,2
4-6 kg	50	20,5	53	18,7	56	27,2	57	31,8	107	40,8	323	27,5
6-10 kg	11	4,5	16	5,7	9	4,4	6	3,4	23	8,8	65	5,5
Over 10 kg	2	0,8	6	2,1	3	1,5	3	1,7	9	3,4	23	2,0
Total	244	100	283	100	206	100	179	100	262	100	1174	100

Table 21. The relationship between income levels of the participants and the most consumed seafood other than fish

Most consumed seafood other than fish	1000-1500 (TL)		1500-2000 (TL)		2000-2500 (TL)		2500-3000 (TL)		3000+ (TL)		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Mussel	74	51,4	65	42,2	52	42,6	30	25,9	31	17,8	252	35,5
Shrimp	19	13,2	29	18,8	31	25,4	24	20,7	47	27,0	150	21,1
Calamari	30	20,8	39	25,3	25	20,5	41	35,3	80	46,0	215	30,3
Octopus	2	1,4	0	0,0	0	0,0	3	2,6	2	1,1	7	1,0
Lobster	0	0,0	5	3,2	3	2,5	0	0,0	1	0,6	9	1,3
Other	19	13,2	16	10,4	11	9,0	18	15,5	13	7,5	77	10,8
Total	144	100	154	100	122	100	116	100	174	100	710	100

4. Discussion

The individuals who participated in the survey stated that they consume red meat with 47.0% and poultry meat with 37.9%. Fish consumption preference ranked third with 13.7% and other seafood consumption ranked fourth with 0.8%. In previous studies, it was reported that the highest meat consumption preference was chicken meat, red meat and fish meat in Mersin (Çiçek et al., 2015), Adıyaman (Olgunoğlu et al., 2014), Antalya (Arslan and İzci, 2016) provinces, respectively. In Elazığ (Çiçek et al., 2014) and Tekirdağ provinces, the highest consumption preference was reported to be red meat, chicken meat and fish meat. In Giresun and Trabzon provinces, the highest consumption was seafood, followed by poultry and red meat (Aydın and Karadurmuş, 2013). It is thought that living area, culinary culture and economic structure are determinant in consumption preference. The most important factors in the preference of Mersin people, who have a predisposition to red meat consumption in their culture, for red meat and poultry meat over fish meat are the fact that the other two meat types are used for more than one meal compared to fish meat (Kutluay-Merdol, 1994; Ertaş and Gezmen-Karadağ, 2013). When we look at the meat consumption preference in our country, red meat is consumed more than fish meat. In addition, economic data show that the cheaper price of chicken meat compared to fish reveals a disadvantageous situation in terms of fish consumption. This situation reduces the consumption of fish meat consumption behind the consumption of red meat and chicken meat. In order to increase the consumption of fish meat, the public should be made aware of its health benefits (Abdikoğlu et al., 2015).

Of the individuals surveyed, 48.0% found fish prices normal, 34.3% found them expensive and 10.8% found them cheap. In this study, the opinions of the respondents on fish prices were in agreement with the findings of studies conducted in Amasya (Kızılaslan and Nalinci, 2013) and Çanakkale province (Çolakoğlu et al., 2006), but not in Ankara (Yavuz et al., 2015), Fatsa and

Aybastı districts of Ordu province (Balık et al., 2013). It is thought that supporting the necessary investment studies to bring the prices of all aquatic products, especially fish, to reasonable levels for the consumer, and carrying out studies on other issues in the aquaculture sector such as developing market and marketing networks to increase the accessibility of consumers to aquatic products will contribute to the consumption of aquatic products in our country to the desired level.

In this study, the highest frequency of fish consumption was determined as once a month. This was followed by once every fifteen days and once a week. The findings of fish consumption frequency studies conducted in different regions and cities of our country are not compatible with the findings of this study. Orhan and Yüksel (2010) reported that the highest fish consumption frequency was 41.4% once a week in Burdur province, Çiçek et al. reported 28.29% once every fifteen days in Elazığ province, Balık et al. reported 36.7% once every fifteen days and 34.8% once a week in Fatsa and Aybastı districts of Ordu province, and Dereli et al. reported 39% once a week in Manisa province.

The reasons for not consuming fish were odor (35.5%), lack of habit (32.3%), difficulty in cleaning (9.7%) and taste (9.7%). In a similar study conducted in Mersin, Çiçek et al. (2015) found that 30% of the reasons for not consuming seafood were odor and 23% cleaning. The findings of previous studies conducted in Burdur (Orhan and Yüksel, 2010), Erzurum (Oğuzhan et al., 2009), Trabzon and Giresun (Aydın and Karadurmuş, 2013) are consistent with the findings of this study.

The fish consumption preference of the individuals who participated in the survey was 61.0% for being healthy, 19.7% for being delicious, and 16.2% for being nutritious. Previous studies support the findings of this study (Aydın and Karadurmuş, 2013, Erdal and Esengün (2008), Çiçek et al. (2014), Çiçek et al. (2015), Hatırlı et al., 2004). This shows that individuals have a positive perception about the importance of consumption of seafood.

While 63.9% of the respondents stated that they had sufficient information about the importance of fish consumption, 36.1% stated that they did not. The findings of previous studies conducted in Antalya (Arslan and İzci, 2016) and Elazığ province (Çiçek et al., 2014) are compatible with the findings of this study, but not with the studies conducted around Keban reservoir (Çadır, 2012) and Ordu province (Balık et al., 2013). In our country, it is possible to say that consumers living in coastal cities have more knowledge about the benefits of aquaculture products and fish meat for human health than consumers living inland from the coast. The place of fish in the ranking of meat consumption preferences of consumers who have a perception that fish should be consumed in terms of health and the frequency of fish meat consumption draw attention as reasons that should be considered and investigated.

In this study, it was determined that consumers mostly obtained fish from supermarkets, fish market and market place. Çiçek et al. (2015) in Mersin province and Arslan and İzci (2016) in Antalya province stated that supermarkets were most preferred. Şen and Şahin (2017) in Mersin, Aydın and Karadurmuş (2013) in Trabzon and Giresun provinces, and Abdikoğlu et al. (2015) in Tekirdağ Süleymanpaşa district reported that fish was mostly purchased from fish market and fish stalls. Çadır (2012) reported that 65.47% of the consumers in Keban dam region caught the fish themselves.

In this study, it was concluded that the participants paid the most attention to freshness (84.3%) when buying fish. In Rize province, Temel (2014) reported 94.8%, in Beşikdüzü district of Trabzon province, Uzundumlu and Dinçel (2015) reported 87.18%, in Manisa province, Dereli et al. reported 28% (Dereli et al., 2016) and in Elazığ province, Çiçek et al. reported 42.56% (Çiçek et al., 2014).

In this study conducted in Mersin province, 71.8% of the participants stated that they consumed the fish immediately after buying it. Olgunoğlu et al. (2014) in Adıyaman province (85%), Oğuzhan et al. (2009) in Erzurum province (65.8%), Çadır (2012) in Keban dam region (74.82%) stated that fish is consumed immediately after purchase.

It was determined that the individuals participating in the survey kept the fish in the refrigerator (52.0%), freezer (20.1%), open (15.9%) and deep freezer (12.0%) until consumption. Çadır (2012) reported that in Keban dam region, fish were stored in the refrigerator and deep freezer until consumption.

In this study conducted in Mersin province, the most consumed fish species were anchovy (24.7%), sea bream (23.3%), sea bass (20.4%), red mullet (11.2%), sardine (7.4%), trout (4.9%), silver (1.9%), mullet (1.7%) and other (4.4%). Şen (2011) in Konya and Mersin, Temel (2014) in Rize, Aydın and Karadurmuş (2013) in Trabzon and Giresun regions, Abdikoğlu et al. (2015) in Süleymanpaşa district of Tekirdağ province, Orhan and Yüksel (2010) in Burdur province, Ercan and Şahin (2016) in Kahramanmaraş province stated that the most consumed sea fish species was anchovy and freshwater fish species was trout. The fact that anchovy fish is mostly produced by fishing in our country both increases the reserve for consumption and the price is more affordable for the consumer due to its abundant production. In addition, the consumption rate of trout is higher especially in provinces outside our coastal regions.

In this survey conducted in Mersin province, 63.2% of the households consumed 1-3 kg of aquaculture products per month, 27.2% consumed 4-6 kg per month, 5.6% consumed 6-10 kg per month and 2.0% consumed over 10 kg per month. Gürgün (2006) found that monthly fish consumption around Lake Van was 2-3 kg with a rate of 41.2%, Hatırlı et al. (2004) found that the average monthly consumption per household in Isparta province was 3.78 kg, Çadır (2012) found that monthly fish consumption (27.4%) around Keban reservoir was 4-6 kg. Temel (2014) determined the annual fish consumption in Rize province, 13% of the households consume 130 kg, 26% between 80-130 kg, 21.7% between 50-80 kg and 39.1% below 50 kg. While the amount and rate of fish consumption in the regions close to the coast are realized at a high level in our country, it is seen that these rates and amounts regarding the consumption of aquatic products in the inland regions far from the coast are decreasing.

In the study, 45.5% of the respondents said that it does not matter, 44.3% said winter, 5.1% said summer, 3.7% said fall and 1.4% said spring. Şen and Şahin (2017) reported that 56% of fish was consumed in Mersin province, Ercan and Şahin (2016) reported that 49.5% of fish was consumed in Kahramanmaraş province, Dereli et al. reported that 63% of fish was consumed in Manisa province, Balık et al. reported that 63% of fish was consumed in Manisa province, and Balık et al. reported that 59% of fish was consumed in winter in Fatsa and Aybastı districts of Ordu province. It is thought that raising awareness and encouraging consumers to consume fish in other seasons will provide important gains both in terms of consumer health and for the whole sector involved in the production and distribution of aquaculture products.

The findings of this study showed that 94.3% of the fish consumption preference in Mersin province is fresh, while frozen and canned fish consumption is 1.8%, salted fish consumption is 0.7% and pickled fish consumption is 0.5%. In previous studies, fresh consumption was reported as the first preference (Çolakoğlu, 2006; Gürgün, 2006; Adıgüzel et al., 2009; Orhan and Yüksel, 2010; Şen, 2011; Balık et al., 2013; Çiçek et al., 2014; Olgunoğlu et al., 2014; Aydın and Karadurmuş, 2013; Abdikoğlu et al., 2015; Yavuz et al., 2015; Arslan and İzci, 2016; Dereli et al., 2016; Şen and Şahin, 2017). Apart from fresh consumption, canned fish consumption was reported to be preferred (Orhan and Yüksel, 2010; Saygı et al., 2015; Şen and Şahin, 2017). Processed fish consumption rate was reported to be 34.9% in Çanakkale province (Çolakoğlu et al., 2006). The people of our country prefer to consume fresh fish. Except for the processed fish consumption rate determined in Çanakkale province (Çolakoğlu et al., 2006), the consumption of processed fish was observed at low levels in other regions and provinces. In terms of the fact that fish can be consumed in all seasons, especially during the hunting ban, individuals should be made aware of and encouraged to consume processed fish, and processed products should be brought to price levels that can be purchased by the consumer.

According to the cooking methods of the participants, frying (49.7%), grilling (29.3%), oven (15.3%) and steaming (4.9%) were the most common methods of fish consumption. Aydın and Karadurmuş (2013) reported that 52.97% in Trabzon and Giresun provinces, Çiçek et al. (2015) 39% in Mersin province, Çadır (2012) 66.19% in Keban dam region, Uzundumlu and Dinçel (2015) 81.22% in Beşikdüzü district of Trabzon province, Dereli et al. (2016) 47% in Manisa province. Ercan and Şahin (2016) reported that 38% in Kahramanmaraş province, Çiçek et al. (2014) 44.22% in Elazığ province, Yüksel et al. (2011) 42% in Tunceli province, oven cooking method was preferred by consumers. Arslan and İzci (2016) reported that in Antalya province, pan cooking method was the most preferred method (37.80%), Kızılaslan and Nalinci (2013) reported that in Amasya province, 37.88% of the consumers preferred pan cooking method. Erdal and Esengün (2008) reported that grilling method was preferred by 79% of the consumers in Tokat province, while Balık et al. (2013) reported that 34.6% of the consumers preferred steaming method in Fatsa

district of Ordu province and 35.3% of the consumers preferred grilling method in Aybastı district. As a result, although the cooking method of fish varies regionally in our country, frying, baking and grilling are the most preferred methods.

In this study conducted in Mersin province, it was determined that the most preferred seafood products other than fish were mussels 36.4%, calamari 29.8%, shrimp 21.0%, lobster 1.2%, octopus 1%, and among these, 56 people responded that crab was not among the options. A group of 480 people stated that they do not consume seafood other than fish. It is supported by previous research findings that mussels are consumed more than squid and shrimp in our country (Hatırlı et al., 2004; Orhan and Yüksel, 2010; Çaylak, 2013; Yavuz et al., 2015).

In the face-to-face interview conducted during the implementation of the questionnaire, consumers stated that they wanted to consume squid and shrimp more, but they could not consume these species sufficiently due to the prices and difficulties in cooking. In a study conducted on the consumption of aquaculture products in our country, it was stated that crustaceans, molluscs and some expensive fish species with high prices are consumed by high-income groups and tourism enterprises (Yazıcıoğlu, 2015). In the light of these findings, it can be said that the amount of consumption of aquaculture products other than fish is low in our country.

In this survey study, it was found that 83.8% preferred canned fish, 4.0% preferred lakerda, 3.9% preferred smoked fish, 3.6% preferred fish balls and 3.1% preferred fish sticks.

As the reason for the preference for canned fish, it was stated that the most advertisement and promotion on processed seafood products was on canned fish. In order to correct such perceptions in terms of the whole processed seafood products, it can be argued that it would be appropriate to carry out promotional and advertising activities for canned fish at least for all other varieties. It has been determined that canned fish, which has a priority place among processed foods in our country, is preferred by individuals working at busy work tempo and students because it is easy to prepare (Kenanoğlu et al., 2007; Adıgüzel et al., 2009; Yüksel et al., 2011; Abdikoğlu et al., 2015; Yavuz et al., 2015).

It was found that 55.4% of the individuals surveyed in Mersin province did not prefer aquaculture fish consumption. Orhan and Yüksel (2010) reported that 93.61% of the consumers in Burdur province preferred sea fish and 6.39% preferred fish obtained by aquaculture, Saygı et al. (2006) reported that 62% of the people living in the central district of İzmir consumed sea fish and 6.39% consumed fish obtained by aquaculture, Yüksel et al. (2011) reported that 23.5% of the consumers in Tunceli province consumed cultured trout, and Dereli et al. (2016) reported that the preference rate of cultured fish in Manisa province was 13%.

In this study, the participants preferred to consume fish at home (82.7%), followed by restaurant (14.3%), picnic (1.4%) and buffet (1.2%). The results of previous studies also support the results obtained in this study. Çiçek et al. (2015) reported that 87% of the participants

in Mersin province, Çiçek et al. (2014) reported that 81.72% of the participants in Elazığ province, Çadır (2012) reported that 69.06% of the participants in Keban dam region, Dereli et al. (2016) reported that 80% of the participants in Manisa province preferred to consume seafood at home. The reason for this was stated to be the high prices in restaurants.

In this study conducted in Mersin province, in terms of meat consumption preference, women (45%) and men (48.9%) preferred red meat the most. In terms of the type of fish consumed, it was reported that anchovy, sea bream and sea bass were preferred the most, respectively. Fish consumption rate was found to be higher in males than females. Fish meat consumption rate was found to be similar in previous studies conducted in Mersin (Çiçek et al., 2015) and Kahramanmaraş (Ercan and Şahin, 2016) provinces. It has been reported that anchovy is the most preferred marine fish species in Turkey and men consume more fish meat than women depending on gender (Çadır, 2012; Ercan and Şahin, 2016). In the province of Antalya, it has been reported that men consume anchovies and sea bream at the highest rate for all age groups and women consume bonito and horse mackerel at the highest rate for all age groups. When all studies are evaluated, it can be concluded that different fish consumption types are related to the production and marketing of fish species regionally.

In this study conducted in Mersin province, the preference for culture fish consumption was found to be higher among men than women. This finding is consistent with the previous study conducted in Mersin province (Çiçek et al., 2015). In this study, in which home consumption of fish was preferred the most, no significant gender-related difference was found.

In this study, it was determined that fish consumption was highest in the age groups above 45 years (18.4%), 26-35 years (12.0%) and 36-45 years (12.9%), and the consumption rate decreased in younger age groups. In the study conducted by Yüksel et al. (2011) in Tunceli province, the consumption rates of fish meat were determined as 41-50 years of age (30%), 31-40 years of age (27.7%), and the least consuming age group was determined as under 21 years of age (16.7%) in women, respectively, which is similar to the findings of this study, while the consumption rate in men was reported to be the highest in the group under 21 years of age (33.3%), 31-40 years of age (26.3%), and the least consumption rate in men between 21-30 years of age (13.3%), respectively.

In this survey conducted in Mersin province, the frequency of fish meat consumption was determined as once a month at most for all age groups. It was found that 36-45 (7.9%) and 45+ age groups (7.5%) consumed fish meat more than once a week, 18-25 age group (14.3%) and under 18 age group (22.2%) did not consume fish meat at all. Çaylak (2013) found that individuals in all age groups in Izmir consumed fish meat more than once a week and the distribution according to age was as follows: ≤ 18 (46.7%), 18-25 (31.6%), 25-35 (38.9%), 35-45 (40.8%) and over 45 (38%). Çiçek et al. (2015) reported that 85% of 18-35, 93% of 36-50, 94% of 51 and over individuals regularly consume seafood in Mersin province. Kızılaslan and Nalinci (2013) reported that in Amasya province, fish and meat consumption was 82.65% in the 18-30 age group, 87.50% in the 31-43 age group and 89.13% in the 44 and over age group.

According to the findings of this study in Mersin, anchovy was the most consumed fish species with a rate of 24.6% among all age groups, while individuals aged 26-35 (23.4%) and 36-45 (22.7%) consumed sea bass the most, and sea bream (28.2%) was consumed in the group over 45 years of age. Çaylak (2013) reported that in İzmir province, sardines (39.3%) were mostly consumed by the group over 45 years of age and sea bream (<18: 42.9%, 18-25: 35.2%, 25-35: 50.9% and 35-45: 39.2%) were mostly consumed by all age groups under 45 years of age and that individuals over 45 years of age preferred sardines due to its high omega-3 content for healthy nutrition due to their advanced age.

In this study conducted in Mersin province, no significant relationship was found between fish consumption preference and education level. In this study, total fish consumption was determined as 13.6%. Çiçek et al. (2015) reported that fish meat consumption preference was 11%, which is similar to the findings of this study.

The relationship between the educational status of the participants and how often they consume fish meat was examined, and the groups consuming more than one fish per week were found to be undergraduate (7.0%), high school (5.6%) and primary school (4.7%) according to their educational status; the consumption frequency of individuals in the postgraduate education group (15.2%) was determined as the highest value among those who consume more than one fish meat per week. Orhan and Yüksel (2010) reported that the frequency of consumption increased with the increase in education level in Burdur. Ercan and Şahin (2016) reported that the rate of those who consume fish meat several times a month in Kahramanmaraş province was 55% and that the highest rate of consumption was in the higher education group with 53%, in the secondary education group with 31% and in the primary education group with 15%.

Güngör (2014) reported that 65.1% of those who consumed fish once a week in Erzurum province were in the undergraduate and graduate education group and that individuals in this group consumed more fish than high school and primary education groups. On the other hand, in Çanakkale province, Çolakoğlu et al. (2006) reported that there was no significant difference between education levels and fish consumption rates, and 43% to 46% of all participants consumed fish at least once a week. Çaylak (2013) reported that there was no significant difference between the frequency of fish consumption and education level and that the rates between education groups were close to each other.

In this study, it was determined that there was no significant relationship between the level of education and the place of fish purchase and that the participants preferred supermarket (33.0%), marketplace (30.5%) and fish market (29.5%) respectively. Çolakoğlu et al. (2006) reported that in Çanakkale province, the preference of all education groups for the place of purchase of fish was concentrated as fish market with a

rate of 39%-45%, university graduates preferred to buy fish from markets in their group distribution and 33.52% of the participants were engaged in amateur fishing. In the study conducted by Çiçek et al. (2015) in Mersin province, which is the sample of the study, it was reported that university graduates preferred to buy fishery products from the market (37%) and fish market (28%), while primary and secondary education graduates preferred to buy fishery products from the market (28%) and from familiar vendors (27%). Ercan and Şahin (2016) reported that in Kahramanmaraş province, 80% of the fish were purchased from the fish market and the distribution of the purchasers according to their education groups was 53% for higher education, 28% for secondary education and 19% for primary education.

When the relationship between the education status of the participants and the type of fish they consume the most was evaluated, it was determined that the individuals in the primary education (36.5%) and high school education (27.9%) group consumed the most anchovies, while the most consumed fish type in the undergraduate (23.8%) and graduate (31.5%) education group was sea bass. It was determined that 4 out of 13 people (30.8%) in the illiterate group consumed sea bream. According to the results of the study conducted by Ercan and Şahin (2016) in Kahramanmaraş province, anchovy was the first preferred species in all education groups among sea fish, while trout was the first choice of all education groups among freshwater fish. In the study conducted by Çaylak (2013) in İzmir province, it was reported that 42.9% of primary school students preferred sardines, 34.2% and 3.5% of high school and undergraduate students preferred sea bream, while 100% of illiterate students preferred to consume sardine fish. Çadır (2012) reported that anchovy species was consumed at the highest rate among marine fish in all education groups in the plain region of Keban reservoir (illiterate: 100% - primary school: 77.05% - secondary school: 60.71% - high school: 72.72% - university: 54.55%). Among freshwater fish, mirror carp was reported to be consumed at the highest rate by all education groups (illiterate: 83.33% - primary school: 65.57% - secondary school: 64.29% - high school: 57.58% - university: 63.64%).

Between the education level of the participants and the amount of fish consumption of their households, it was determined that the first place (63.3%) consumed 1-3 kg of aquaculture products per month and the second place (27.2%) consumed 4-6 kg of aquaculture products per month. According to the answers given by the participants, the highest proportional distribution of the monthly consumption of 1-3 kg according to their educational status was determined as primary education (69.5%), illiterate (69.2%), high school (66.8%), undergraduate (61.8%) and graduate (45.7%). In addition, in the group where the monthly consumption amount of aquaculture products was determined as 4-6 kg in the second place, the highest rates according to the education level of the participants were determined as Graduate (44.6%) and Undergraduate (29.7%).

In this survey study conducted in Mersin, there was a significant correlation between educational status and consumption preference for culture fish, and the primary school (60.6%), high school (62.8%) and graduate (52.2%) groups did not prefer consumption, while the undergraduate and illiterate group preferred consumption. Çiçek et al. (2015) reported that the consumption preferences according to the production source of aquaculture products were 32% for university graduates, 16% for aquaculture and 52% for hunting, 16% for aquaculture and 52% for hunting+aquaculture, and the same order for secondary and high school graduates was 30% for hunting, 14% for aquaculture and 56% for hunting+aquaculture.

In this study conducted in Mersin, it was found that the group with postgraduate education (79.3%) had the highest rate of adequate knowledge about fish consumption, while the group with primary education (54.2%) had the lowest rate. Ercan and Şahin (2016) determined that 51% of the participants in Kahramanmaraş province knew the importance of the effect of fish on human health and 52% of the participants in this rate were in the higher education group, 25% in the primary education group and 23% in the secondary education group, which is similar to the findings of this study.

It was concluded that 52.7% of the participants in primary school, 58.2% in undergraduate school, 57.6% in graduate school, 76.9% in illiterate group paid attention to the fishing ban time and fish size, while 53.5% in high school group did not pay attention. Çaylak (2013) reported that individuals at all educational levels were aware of the fishing ban period and consumers did not buy small fish. The findings of this study support the present study.

In this study conducted in Mersin, it was determined that the group working in the public sector consumed fish once a week, while other occupational groups consumed fish once a month. Kızılaslan and Nalinci (2013) reported the proportional distribution of fish meat consumption according to occupational groups in a study conducted in Amasya city center as follows Workers: 81.03% - Civil servants: 89.29% - Farmers: 100% - Self-employed: 81.58% - Retired: 87.80% - Housewives: 88.98% - Craftsmen: 86.11% - Unemployed: 66.67% and the rate of individuals in other occupational groups was reported as 90.00%.

The low income group of the participants prefer poultry meat and the high income group prefer red meat consumption. In Mersin, the preference for fish meat consumption ranked third in this study. Dereli et al. (2016) reported that the low-income group preferred poultry meat and the high-income group preferred red meat consumption in Manisa province, whereas Çadır (2012) reported that fish meat was the first choice of all income groups in Keban dam region and Adıgüzel et al. (2009) reported that fish meat was the first choice of all income groups in Almus district of Tokat province. The reason for this difference in meat consumption can be considered to be the income status of individuals and the amount of fish production in the region where they live.

In this study, it can be stated that the frequency of fish consumption increases with the increase in income level. In the study, it was determined that the participants with the highest income group consumed fish once a week.

Previous studies have also reported that the frequency of fish consumption increases in parallel with the increase in income (Çolakoğlu et al., 2006; Şen, 2011; Çaylak, 2013; Güngör, 2014).

In this survey study conducted in Mersin, it was found that the low- and middle-income groups of the participants consumed more anchovies, the middle level group consumed more sea bream and the group with the highest income level consumed more sea bass. The relationship between income level and the type of fish consumed in Kahramanmaraş province is consistent with this study (Ercan and Şahin, 2016). Çaylak (2013) reported that sardines (36.4%) were mostly preferred in the 600-800 TL income group and sea bream (55.4%) in the 1500-2500 TL income group in İzmir province.

In this study conducted in Mersin province, it was found that the frequency of fish consumption of all income groups was 1-3 kg per month, while consumption increased to 4-6 kg per month at the middle- and above-income level. The data of this study are compatible with the findings of previous studies (Çadır, 2012).

In our study, it was observed that fish consumption decreased as the number of people living in the household increased. Şen et al. (2008) reported that fish was the most consumed meat type (74%) in households with a total monthly meat consumption of 0-500 g and chicken was the most consumed meat type in households with meat consumption above 500 g in Elazığ province.

In this study, it was determined that the consumption rate of anchovy increased as the number of people living in the household increased. Households with two and three people consume sea bream and sea bass the most, respectively. In the studies supporting the finding of the study according to the number of households, Hatırlı et al. (2004) reported that families in Isparta province consumed anchovies the most with a rate of 51.51%; Adıgüzel et al. (2009) reported that families in Almus district of Tokat province consumed anchovies from sea fish with a rate of 27.67% and trout from freshwater fish with a rate of 33.89%. In contrast to the results of this study, Temel (2014) reported that in Rize province, households preferred red mullet (68.6%) followed by anchovy (49.5%) in the fall and winter seasons, and mostly trout (60.8%) and horse mackerel (22.6%) in the spring and summer seasons.

5. Conclusion

In our country, there are changes in the distribution of consumption of aquaculture products according to regions. When the findings of the related studies are evaluated, it is seen that the per capita consumption of fish is very low in Eastern and Southeastern Anatolia and Central Anatolia regions, while the rate is higher in regions close to the coast, especially in the Black Sea.

As in the whole country, individuals should be encouraged to consume fishery products in Mersin province by raising awareness. Promotional activities to be carried out jointly by local administrations and other public-civil institutions and organizations will be effective in the widespread consumption of aquaculture products. Educational and encouraging activities to be carried out especially through educational institutions will be extremely effective in developing food culture among children. In this context, encouraging children in kindergarten and primary schools to consume fish and aquaculture products, as well as other aquaculture products, through similar activities such as the milk distribution project, will make a significant contribution to increasing the consumption habits of aquaculture products at a later age. Considering the difficulty of obtaining seafood products out of season and the high price differences, advertising and promotional activities should be carried out to direct individuals to processed seafood products according to their consumption habits, desires and needs. Since the fish stock in our seas is not at a sufficient level, it will be important for the consumption of these products to carry out the necessary information and encouragement activities in order to eliminate the negative judgments of the consumers of aquaculture products, especially the aquaculture fish species. Encouraging and supporting all organizations engaged in the production and cultivation of aquaculture products in terms of financial and technical information will contribute to the increase in production in this field, increase employment, and contribute to the transformation of prices in favor of the consumer in terms of the supply and demand balance of aquaculture products. With the decrease in the prices of aquaculture products, especially fish, it will be easier for consumers to access these products. Creating modernized enterprises in accordance with today's technology, including freezing, salting, canning and packaging units of seafood products, as well as the importance of the development of fishing and aquaculture of seafood products, will contribute to the economic growth of the sector in this field and, as a result, to increase the amount of seafood consumption of individuals.

Author contributions

Sivri BH; Conceptualization, Methodology, Writing - Original Draft, Writing-Review and Editing, ÇİFTÇİ N; Writing-Review and Editing, AYAS D; Conceptualization, Data Curation, Review and Editing, Visualization.

Conflicts of interest

The author declare that for this article they have no actual, potential, or perceived conflict of interest.

Statement of Research and Publication Ethics

For this type of study formal consent is not required.

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