



RESEARCH ARTICLE

Analysis of the Factors Affecting the Tendency of Fishery Consumption: Case of Iğdır Province

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ABSTRACT

In the research, socio-economic and demographic factors affecting the fish consumption amount of consumers in Iğdır province were tried to be determined. The main material of the research is the survey data obtained from 325 consumers residing in the province of Iğdır and determined by using the commensurate sampling method. In the research, the factors affecting the fish consumption amount of the consumers were analyzed with the sequential probit model. In the sequential probit model created, the fish consumption levels of the consumers were used as the addict variable, and the inaddict variables were determined as gender, income level, frequency of fish consumption, type of fish consumed, annual red meat consumption and type of fish consumption. The model results; The variables of gender, income level, frequency of fish consumption, type of fish consumed, annual red meat consumption and fish consumption pattern were all found to be statistically significant. According to the ordinal probit model results, it was determined that the gender of the consumer decreased the fish consumption level. As expected in the research, it was defined that there was a negative relationship between income level and fish consumption level, and a positive relationship between fish consumption frequency and consumption amount. With respect to the model conclusions, it was defined that there is a positive relationship between the amount of red meat consumption of consumers and the amount of fish consumption.

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1. Introduction

Today, the rapidly increasing world population, global warming and pandemic processes have increased the tendency to healthy and balanced nutrition. Animal proteins play an active role in a healthy and balanced diet.

Today, it is stated that a healthy person should consume 1 g of protein per kilogram of body weight per day, of which 42% should be of animal origin (WHO, 2020). In developed countries, less developed while the amount of daily protein consumption per capita has doubled compared to developing countries or developing countries, the rate of protein intake from animal products in developing countries is around 20% (Béné et al., 2007; Belton et al., 2016). In developed countries,

this rate is around 65% (Anonymous, 2013). Fish, which is among the animal proteins, meets the body's basic nutritional needs with its rich protein content and polyunsaturated fatty acids in its structure. In addition, fish play an active role on human physiology and metabolic functions (Yücel, 2001; Kaya et al., 2004; Roos et al., 2007; Marques et al., 2019).

Production of fishery products is not distributed homogeneously throughout the world. China is the leader in world aquaculture production, accounting for 35% of the total production (62.8 million tons), followed by India, Indonesia, Vietnam and Peru. In aquaculture, the total production of sea and inland water fishing has been at the level of 90 million tons in recent years. In the amount of hunting production, China has

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the largest share (14.6%), followed by Indonesia, Peru, India, Russia, USA and Vietnam. While 51% of the aquaculture production is obtained through hunting, 52% of the fishing is carried out in the Asian continent (FAO, 2022). Of the world aquaculture production, which was 177.8 million tons in 2020, 87.5 million tons (49%) were obtained from aquaculture. 33 million tons of aquaculture production was obtained from the sea and 54 million tons from inland waters (FAO, 2023).

In aquaculture, China produced 49.62 million tons in 2020, 57% of the world's total production. Türkiye became the largest producer country in the European continent in 2021 with 799851 tons. In addition to being surrounded by the sea on three sides due to its location in Türkiye, it has an important aquaculture potential with its inland waters, lakes and dam lakes. Aquaculture constitutes 59% of Türkiye's aquaculture production. 71% of aquaculture production took place in seas and 29% in inland waters. 89% of aquaculture production in Türkiye consists of sea bass (33%), sea bream (28%) and trout (Turkish Salmon) (28%). Trout production constitutes 98.6% of the fish produced by aquaculture from inland waters. 36.4% of the production carried out by aquaculture in the seas was realized in Muğla, 16.6% of the production in inland waters was realized in Elazığ. While almost all of the aquaculture production in the seas consists of sea bass and sea bream, only trout in inland waters. The most important share in fishing from the seas belongs to the Black Sea with 77.5%, the Aegean with 12.6%, the Mediterranean with 5.1% and the Marmara Region with 4.9%. The most important species caught from the seas in Türkiye is anchovy (TEPGE, 2021).

Seventy-two percent of the 157 million tons of aquatic products consumed in 2019 were consumed in the Asian Continent. China, Indonesia, India, USA and Japan come first in seafood consumption. Looking at the world in general, it has been designated that 17% of animal protein needs are met from fish in 2019 and this figure corresponds to 7% of all protein consumed (FAO, 2022). While the world fish consumption was 9 kg per capita in 1961, it reached 20.5 kg in 2019. In 2019, 75% of the per capita aquaculture consumption was met from fish. While the annual per capita consumption of fisheries products in Türkiye was 6.3 kg in 2019, it was determined as 6.5 kg in 2021 (TUIK, 2023). Per capita aquaculture consumption in Türkiye is lower than the world average.

In addition to being related to factors such as consumption amount, consumption habits, production amount and price of fishery products, consumer purchasing power, the way it is presented to the market and consumption time, the consumption of fishery products in Türkiye also varies by region. Although the average annual fish consumption per capita in Türkiye is low in Eastern Anatolia, Southeastern Anatolia and Central Anatolia regions, it is quite high in the Black Sea and other coastal regions (Aydın & Karadurmuş, 2013; Ercan & Şahin, 2016). Similarly, per capita consumption in regions near the

sea, for example, is 28.08 kg per year in Giresun and Trabzon (Aydın & Karadurmuş, 2013), 25.8 kg per year in Mersin; 21.5 kg per year (Demirtaş et al., 2014; Şen & Şahin, 2017), 15 kg per year in İzmir, 13 kg per year in Tokat, 12.4 kg per year in Isparta, 6.5 kg per year in Erzurum, 4.13 kg per year in Kahramanmaraş, 3.8 kg per year in Niğde (Hatırlı et al., 2004; Erdal & Esengün, 2008; Çaylak, 2013; Ercan & Şahin, 2016; Bashimov, 2017; Uzundumlu, 2017), and 3.4 kg per year in Ankara (Gül Yavuz et al., 2015).

Iğdır is a province located in the Eastern Anatolia Region of Türkiye and in the easternmost part of Türkiye. Azerbaijan (Nakhchivan), Iran and Armenia are border neighbors. The province of Iğdır is completely within the basin of the Aras River. The important streams that join the Aras River within the provincial borders are the Gaziler Stream, Buruksu Stream in the west, and the Aşağı and Orta Karasu Streams in the east. There is a trout facility in Tuzluca district of Iğdır province and its production capacity is around 25 tons in year. The aim of our research is to determine the amount of fish consumption and the socio-demographic and behavioral characteristics of the factors affecting the consumption level of the consumers living in the city center of Iğdır, where it is far from the sea and there is very little aquaculture.

2. Materials and Methods

The basic material of the survey is the original data picked up through questionnaires from 325 consumer living in the urban area of Iğdır. The survey took place between the autumn and winter of 2022. The sample size was decided by the simple random sample method (Topçu & Dağdemir, 2017). In accordance with Article 10/1 of the Iğdır University Scientific Research and Publication Ethics Directive, the survey complies with scientific research and publication ethics.

2.1. Econometric Analysis

In the study, the factors impressive the fish consumption level were analyzed with the help of Ordered Probit Model estimation. In cases where the addict variable is categorical or ordinal, ordered logit or probit probability estimators can be used. Maximum Similarity functions are used in both methods. Although the ordinal probit model is rested on the normal probability dispensation, the ordinal logit model is derived from the standardized logistic probability dispensation. The feature that distinguishes the ordinal probit model from the ordinal logit model is the normal dispensation of errors. In the ordered probit model, it is assumed that there is a continuous but unobservable latent addict variable behind the observable, interval and ordered categories (y). The unobservable, latent addicted variable (y^*) is explained by the vector of illustrative variables and the error term. It is assumed that the error term has a normal distribution (Greene, 2008).

$$n = t[1 + (0,02)(b - 1)] * pq/E^2 \quad (1)$$

In the ordered probit model, it is assumed that there is a continuous but unobservable hidden addict variable behind the observable, interval and ordered categories (y). The unobservable, hidden addicted variable (y*) is explained by the vector of explanatory variables and the error term. It is assumed that the error term has a normal distribution (Greene, 2012).

$$Y^* = X' \beta + \varepsilon \varepsilon \sim N[0,1] \tag{2}$$

Here, y*; unobservable addicted variable, x; vector of explanatory variables, β; parameter vector to be estimated and ε; indicates the error term. The relationship between the addict variable (y) and the unobserved addict variable (y*) is considered as a function of the threshold values (μj) that take separate values according to the consumers and are estimated using the regression coefficients (β). In the research, the fish consumption level of the consumers was classified in four different sequential categories (Y=0, 1, 2, 3). According to this; The relationship between the addict variable (y) of the model and the unobserved addict variable (y*) will be as follows (Chen et al., 2002; Greene, 2012).

$$if 0 < y^* \leq \mu, \quad y = 0 \tag{3}$$

$$if \mu, < y^* \leq \mu, \quad y = 1 \tag{4}$$

$$if \mu, < y^x \leq \mu, \quad y = 2 \tag{5}$$

$$if \mu, \leq y^x \quad y = 3 \tag{6}$$

The “μ” in the equaty are the threshold values that are estimated in the model and form the lower and upper limits of the values that y will take (Greene, 2008). The ordinal categories of the addict variable used in the model, “Y=0” variable 1-3 kg fish consumption level, “Y=1” variable 4-6 kg fish consumption level, “Y=2” variable 7-10 kg fish consumption level and “Y=3” variable represents the fish consumption level of more than 10 kg.

In the ordered probit model, the error term is assumed to be normally distributed. The probability that consumers will be in one of the 4 categories of fish consumption level is as follows: (Greene, 2012).

$$Prob (y = 0|x) = \Phi (- x\beta), \tag{7}$$

$$Prob (y = 1|x) = \Phi (\mu_1 - x\beta) - \Phi (- x \beta), \tag{8}$$

$$Prob (y = 2|x) = \Phi (\mu_2 - x' \beta) - \Phi (\mu_1 - x' \beta), \tag{9}$$

$$Prob (y = 3|x) = 1 - \Phi (\mu_3 - x\beta) \tag{10}$$

For these likelinesses to be positive; It should be $0 < \mu_1 < \mu_2$. Φ denotes the cumulative normal distribution function. It is inconvenient to directly interpret the coefficients of the variables of the ordered probit model estimated using the maximum likelihood method (Akabay et al., 2007). The effects of explanatory variables on probabilities are not the same as parameter (β) estimates because they depend on the values of explanatory variables. It is not clear how to interpret the coefficients without additional computation in the ordered probit model. This entails estimating the marginal effects of interpretive variables so as to determine the effect on probabilities. The marginal effects of the variables are calculated for each likelihood as follows (Greene, 2012).

$$\partial prob(y = 0|x) / \partial x = \phi(x'\beta)\beta, \tag{11}$$

$$\partial prob(y = 1|x) / \partial x = [\phi(x'\beta)\beta, -\phi(\mu_1 - x'\beta)\beta], \tag{12}$$

$$\partial prob(y = 2|x) / \partial x = [\phi(\mu_1 - x'\beta)\beta, -\phi(\mu_2 - x'\beta)\beta], \tag{13}$$

$$\partial prob(y = 3|x) / \partial x = [\phi(\mu_3 - x'\beta)\beta, \tag{14}$$

The ordered probit model, which is one of the limited addict variable model types, was estimated using the Limdep Econometric Computer Program.

3. Results and Discussion

In the econometric analysis made for the fish consumption desire and tendency of the participants in Iğdır province, the annual fish consumption amount is the addict variable. The average age of the consumers participating in the survey is 30.25, the youngest consumer is 15, and the oldest is 75 years old.

Table 1. Variable definitions and instance statistics (Case=325, Missing=0).

Variable	Explanation
Gender (Q1) (Binary)	1: Female; 0: Male
Household (person) (Q3)	1: 2-5 2: 5-7 3: 7-10 4:10-15 5: 15
Education (year) (Q4)	1: Illiterate 2: Primary Education 3: Secondary Education 4: High School 5: University
Occupation (Q5)	1: Farmer 2: Self-Employed 3: Officer 4: Worker 5: Retired 6: Student 7: Housewife
Income (₺/month) (Q6) (Binary)	1: Fixed Income 0: Others
Income level (₺/month) (Q7)	1: 5000 ₺> 2: 5001₺-10000 ₺ 3: 10001₺-15000 ₺ 4-15000 ₺<

Table 1. (continued)

Variable	Explanation
Income status (₺/month) (Q8)	1: 15000 ₺<; 0: 15000 ₺>
The most readily available type of meat (Q9)	1: Cattle 2: Sheep 3: Goat 4: White Meat 5: Fish
Frequency of consuming fish (Q10)	3: Once A Week 2: Every 15 Days 1: Once A Month 0: Less
Are there any places where fish are sold regularly in the region? (Q11) (Binary)	1: Yes 0: No
Where do you buy the fish? (Q12)	1: Marketplace 2: Fish State 3: Fish Market 4: Peddler
Where do you buy the fish? (Q13)	1: Marketplace + Peddler 0: Others
The most consumed type of fish (Q14)	1: Trout 2: Bream 3: Perch 4: Horse Mackerel 5: Anchovy 6: Sardines 7: Acorn
The most consumed fish species) (Binary) (Q15)	1: Anchovy + Horse Mackerel 0: Others
Annual fish consumption amount (kg/year) (Q16)	0: 1-3 Kg 1: 4-6 Kg 2: 6-10 Kg 3: 10 Kg<
Annual red meat consumption amount (kg/year) (Q17)	1: 1-3 Kg 2: 4-6 Kg 3: 6-10 Kg 4: 10-15 Kg 5: 15-20 Kg 6: 20kg<
Annual white meat consumption amount (kg/year) (Q18)	1: 1-3 Kg 2: 2-6 Kg 3: 6-10 Kg 4: 10-15 Kg 5: 15-20 Kg 6: 20kg<
How to consume fish (Q19)	1: Fresh 2: Canned 3: Salty 4: Brine 5: Other
How to consume fish (Q20) (Binary)	1: Fresh 0: Others
What is your method of cooking fish? (Q21)	1: Frying 2: Grid 3: Steaming 4: Others
What is your method of cooking fish? (Q22)	1: Fry + Grill 0: Others
Are you fishing? (Q23)	1: Yes 0: No
Do you care about being balanced and healthy? (Q24)	1: Yes 0: No

While the number of household members is 48.31%, families with 2 to 5 individuals, 32.61% are families with 5-7 individuals, 11.69% have 7-10 individuals, and 6.77% have 10-15 individuals. families and 0.62% are families with 15 or more individuals.

When the education level is examined in the research, university with 31.38% and high school graduates with 31.38% are in the first place, primary education is in the second place with 16.32%, secondary education is in the third place with 16.00% and 4.92% is in the first place. and illiterate consumers take the fourth place.

When the occupational status is examined, self-employment with a rate of 22.46% and students with a rate of 22.46% are in the first place, while civil servants with a rate of 15.69% and a worker with a rate of 15.69% take the second place. In case of occupation, 13.85% of the participants are housewives, 7.39% are self-employed and 2.46% are retirees.

When the income status is examined, it is determined that 17.85% of the participants have an income level of less than 5000 ₺ and 17.85% of them have an income level between 5 001 and 10 000 ₺, while 61.84% of them have an income level between 10 001-15 000 ₺, It has been determined that 2.46% of

them have an income level of over 15 000 ₺. Within the scope of the research, the most easily obtained meat type in the region is white meat with a rate of 32.31%. In the preferences of consumers, beef is in the second place with 31.38%, sheep meat is in the third place with 27.38%, goat meat is in the fourth place with 7.69%, and fish is in the fifth place with 1.23%.

When the frequency of fish consumption was analyzed, it was defined that 9.54% of the participants consumed fish less than once a week, 19.69% every 15 days, 36.62% once a month and 34.15% less than once a month. In Türkiye, 50% of the consumers in Erzincan (Karakaya et al., 2020) and in another study conducted in Mexico, 24.24% of the individuals reported that every fortnight (Pérez-Ramírez et al., 2015), South Korea In the study conducted in the province of Ardahan, Türkiye, 7.3% of the households were found to be more than once a week (Lee & Nam, 2019), and in another study conducted in Serbia, 52.24% of the participants (Djordjevic et al., 2015) 26.16% (Kılıç et al., 2019), in the study conducted in Mersin, 42.00% (Şen & Şahin, 2017), and in the study conducted in the USA, 24% of the individuals (Hicks et al., 2008) It was determined that they consumed fish once.

In the research region, it was defined that 31.69% of the participants bought fish from the markets where fish are sold, 27.08% from the market place, 25.23% from the fish market and 16.00% from the peddlers. In the study handled in Ankara, it was determined that consumers who prefer to consume fresh fish do not buy fish from fixed consumption places (Gül Yavuz et al., 2015).

When the most consumed fish species were examined, 28.31% of the participants were trout, 28.00% of sea bream, 16.92% of anchovy, 11.69% of sea bass, 8.31% of horse mackerel and 6% of participants. It was determined that 77 of them consumed bonito. In a study handled in Ankara, it was determined that 56.10% of consumers consume anchovy (Gül Yavuz et al., 2015). In the study handled in Mersin, it was determined that the consumers consumed the most (27%) sea bream and the second (21%) anchovy (Şen & Şahin, 2017).

It was determined that 34.15% of the participants consumed more than 6-10 kg, 28.31% of them 4-6 kg, 23.69% of them 1-3 kg and 13.85% of them consumed more than 10 kg of fish per year.

Considering the annual consumption of red meat, 24.62% of the participants are 10-15 kg, 19.38% are 6-10 kg, 18.15% are 4-6 kg, 17.85% are over 20 kg, and 9.23% consume 1-3 kg of red meat. In the study conducted in the province of Erzincan, it was determined that 54.40% of the consumers and in the study conducted in the province of Mersin, 46.00% of the consumers tended to consume red meat (Şen & Şahin, 2017; Karakaya et al., 2020).

Considering the annual consumption of white meat, 30.46% of the participants are over 20 kg, 24.92% are 10-15 kg, 22.15%

are 2-4 kg, 11.38% are 6-10 and again, it was determined that 11.38% consumed white meat between 1-3 kg and 10.77% 15-20 kg.

When the fish consumption pattern was examined, it was determined that 61.54% of the participants preferred to consume fish as fresh, 33.54% preferred grilled, 12.92% steamed and 11.39% preferred fish in other ways. In the study handled in Erzincan, it was determined that 53% of the consumers consumed fish in the pan, 20% on the grill, 17% in the oven and 10% as steamed fish. Karakaya et al. (2020) in the province of Erzincan and Bayraktar (2015) in the provinces of Ankara and Çanakkale found that 62.00% of consumers prefer grilled and steamed and 27.00% fry. In a study conducted in Diyarbakır, it was reported that 44.30% of consumers prefer the frying method (Aydın & Odabaşı, 2017), while in Tunceli, 34.00% of individuals prefer to cook the fish in the oven (Balci et al., 2016). In the study conducted by Kırıcı et al (2018) in Siirt province, pan-fried consumption as a form of fish consumption is in the 1st place with a rate of 31.70%, Olgunoğlu et al (2014) in Adıyaman and Terin et al. (2016) in Van. In their study, they found that the fish consumption type was frying at a rate of 41.00% and 40.20%, respectively.

When the fish cooking method was examined, it was determined that 42.15% of the participants cooked fish as fried, 33.54% grilled, 12.92% steamed and 11.39% others (sushi, soup, etc.). In the study conducted in Erzincan, 53.00% of the consumers were in the pan (Karakaya et al., 2020), in the study conducted in Mersin, 42.00% was grilled (Şen & Şahin, 2017), and in the study conducted in Diyarbakır 44.30%. fried (Aydın & Karadurmuş 2013), and in a study conducted in Tunceli, it was determined that 34.00% of consumers prefer to consume fish in the oven (Balci et al., 2016).

The coefficient and unit (marginal) effect results of the sequential probit model created to analyze the factors affecting the fish consumption level of consumers living in the urban area of Iğdır Province are given in Table 2. In the sequential probit model created, the fish consumption levels of the consumers were used as the addict variable, and the inaddict variables were determined as gender, income level, frequency of fish consumption, type of fish consumed, annual red meat consumption and type of fish consumption.

The model estimated by the maximum likelihood method is statistically significant ($p < 0.000$). According to Maddala (1983), the threshold values of the model should be positive and $\text{Mu}(1) < \text{Mu}(2)$. According to the model results, the threshold value parameters $\text{Mu}(1)$ and $\text{Mu}(2)$ of the model were positive and statistically significant at the 1% level. The fact that the threshold values are econometrically important indicates that the fish consumption level grouping is accurate.

Table 2: Ordered Probit model results.

Variables	Estimated Coefficients	Marginal Effects			
		Y=0 (1-3 kg)	Y=1 (4-6 kg)	Y=2 (7-10 kg)	Y=3 (10< kg)
Constant	0.21779 (0.2918)	--	--	--	--
Gender	-.25246** (0.0384)	0.07406** (0.0394)	0.02614** (0.0467)	-0.05104** (0.0385)	-0.04916** (0.0432)
Income	-.15235** (0.0310)	0.04462** (0.0323)	0.01602** (0.0419)	-0.03088** (0.0340)	-0.02975** (0.0346)
Frequency of consuming fish	.24565*** (0.0001)	-0.07194*** (0.0002)	-0.02584*** (0.0013)	0.04980*** (0.0002)	0.04798*** (0.0004)
The most consumed type of fish	-.27460* (0.0536)	0.08451* (0.0660)	0.02370** (0.0267)	-0.05879* (0.0663)	-0.04942** (0.0395)
The amount of red meat consumed annually	.20466*** (0.0001)	-0.05994*** (0.0001)	-0.02152*** (0.0001)	0.04149*** (0.0001)	0.03997*** (0.0001)
Fish cooking method	-.17544* (0.0916)	0.05138* (0.0932)	0.01845 (0.1036)	-0.03557* (0.0966)	-0.03426* (0.0942)
Mu(1)	0.85393*** (0.0000)				
Mu(2)	1.98151*** (0.0000)				
Log likelihood function		-406.72780			
Restricted log likelihood		-435.20795			
Chi squared [6 d.f.]		56.96031			
Significance level		0.00000			

Note: ***, **, * ==> Severity: 1%, 5%, 10%. Values in parentheses are p values.

According to the model results; The variables of gender, income level, frequency of fish consumption, type of fish consumed, annual red meat consumption and fish consumption pattern are all statistically significant.

Since the interpretation of the coefficients of the sequential probit model results may cause errors, the comments on the factors affecting the fish consumption level were made by evaluating the marginal effects. Among the marginal effects, except for the coefficient of the fish consumption pattern variable (Y=1), the marginal effects are statistically significant and the comments were made on these variables.

According to the ordinal probit model results, the fact that the gender of the consumer is female reduces the level of fish consumption. Since Iğdır is a male-dominated province and men are more likely to be fed outside the home than women, the fact that the consumer is male increases fish consumption. Being a female consumer increases the probability of consuming 1-3 kg (Y=0) fish by 7.41%, and the probability of consuming 4-6 kg (Y=1) by 2.61%, while the probability of consuming 7-10 kg (Y=2) fish and 10 kg (Y=3) reduces fish consumption by 5.10% and 4.92%, respectively.

There is a negative correlation between income level and fish consumption level. In previous studies, the opposite was found, and a positive relationship was determined between household income level and fish consumption (Akinbode &

Dipeolu, 2012; Can et al., 2015; Dauda et al., 2016; Terin, 2019). Since the fish species consumed in Iğdır are cheaper than red meat and the fish caught from rivers and lakes in the region are sold at low prices, they are more preferred by those with low income. While income level above 3000 ₺ increases the probability of 1-3 kg (Y=0) fish consumption by 4.46% and 4-6 kg (Y=1) fish consumption probability by 1.60%, while 7-10 kg (Y=0) fish consumption probability at the same income level increases by 4.46%. Y=2) and over 10 kg (Y=3) reduce the probability of fish consumption by 3.01% and 2.98%, respectively.

As expected, there is a positive relationship between the frequency of fish consumption and the amount of consumption. As the frequency of fish consumption increases as a period, the probability of fish consumption level (Y=0) and (Y=1) decreases by 7.19% and 2.58%, while the probability of being (Y=2) and (Y=3) decreases by 4.98% and (Y=3). increasing by 4.80%

One of the issues examined in the model is the relationship between the type of fish consumed and the level of fish consumption. According to the model results, it is possible that those who consume anchovy and horse mackerel, which are the most common sea fish in Türkiye, have lower fish consumption levels. Those who prefer anchovy and horse mackerel in fish consumption increase the probability of being in the (Y=0) and

(Y=1) groups by 8.45% and 2.37%, respectively, while the probability of being in the (Y=2) and (Y=3) groups is 5%, 88 and 4.94% decrease.

According to the model results, there is a positive relationship between consumers' red meat consumption and fish consumption. Red meat is mainly consumed in the region and there is no comparison with fish meat. While fish meat is consumed more seasonally and according to its availability in the region, red meat is constantly reached and consumed. Therefore, red meat and fish meat are not considered as substitutes for each other. This reveals a positive relationship between them in terms of consumption. The increase in the amount of red meat consumption of consumers (Y=0) and (Y=1) decrease the probability of being in the fish consumption group by 6.00% and 2.15%, respectively, while the probability of being in the fish consumption group (Y=2) and (Y=3) decreases by 4.14%. and increases by 4.00%.

Fish cooking method has also been identified as one of the variables that determine the amount of fish consumption. It has been determined that those who prefer their fish consumption by frying and grilling are less likely to consume fish than those who consume it in other ways. That is, the probability of finding (Y=0) and (Y=1) fish frying and grilling was 5.14% and 1.85%, while the probability of finding (Y=2) and (Y=3) was 3.56% and (Y=1). It decreases by 3.43 percent.

4. Conclusion and Recommendations

In the research, the gender, income, frequency of fish consumption, the most consumed fish species, the amount of red meat consumed annually and the method of cooking fish determine the fish consumption tendency of the consumers. In the study, when the relationship between fish consumption and gender is examined, it has been determined that the level of fish consumption decreases if the consumers are women and the income level is high.

In order to increase the consumption of aquatic products, which are a healthy food source in terms of balanced and healthy nutrition and sustainability, the region should be enriched with facilities where aquaculture products can be produced regularly and fish can be kept. In this way, the consumer group that tends to red meat can be directed to seafood. It is possible to improve the fish consumption habits of the consumers by conducting training activities on healthy and balanced nutrition in the province. The public and private sectors and even professional organizations can play an effective role in changing the consumption preferences and habits of consumers. With all these activities, the aquaculture sector can be developed in all societies with the same ecological characteristics and consumer tendencies.

Conflict of Interest

The author declares no conflict of interest.

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