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Determination of Fish Consumption Habits and Preferences of Teachers Working in Bingöl Province

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Abstract

This study aimed to determine the socio-demographic and economic characteristics, monthly expenditures, and meat and fish consumption patterns of teachers working in the city center of Bingöl Province. The data for the study were collected through face-to-face interviews conducted with teachers working in the city center of Bingöl between May 2023 and July 2023. According to the findings of the study, the average monthly net household income was calculated as 23984.596₺, the average monthly expenditure was 14906.215₺, the average monthly food expenditure was 5783.475₺, and the average monthly fish expenditure was 436.57₺. It was determined that the monthly fish consumption quantity of the surveyed teachers ranged from 1 kg to 2.66 kg, with an average of 2.54 kg, and they purchased trout from a fixed vendor during the winter months and consumed them baked in the oven, but this consumption amount was not sufficient for them. It was concluded that the tendency of the surveyed teachers to increase fish consumption was more strongly related to the decrease in fish prices rather than an increase in income. In other words, teachers expect a decrease in fish prices rather than an increase in their income to increase fish consumption. In conclusion, increasing the consumption of aquatic products, both in Bingöl and throughout Türkiye, is an important step that could have positive effects on health, and collaboration among various stakeholders is necessary to achieve this goal.

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INTRODUCTION

Today, heightened emphasis is placed on dietary practices, particularly within developed nations, where individuals demonstrate a notable conscientiousness towards selecting appropriate foods conducive to their well-being. Within this framework, fish emerges as a prominent dietary staple due to its considerable nutritional value. Abundant in protein and polyunsaturated fatty acids, fish assumes a pivotal role in fulfilling the body's essential dietary requirements. Additionally, it is known that fish has positive effects on human physiology and metabolic functions (Kaya et al., 2004). Therefore, fish holds an important place in nutrition programs for those who seek to maintain a healthy lifestyle. In the last 60 years, along with changing consumer preferences, technological advancements, and income increases, the consumption of seafood has significantly increased. In 2019, 72% of the 157 million tons of seafood consumed globally were consumed in Asia. Leading countries in seafood consumption include China, Indonesia, India, the USA, and Japan. According to FAO data in 2022, 17% of the global animal protein requirement was met by fish in 2019, equivalent to 7% of the total protein consumed. The variation in fish consumption among countries is attributed to consumer income levels and dietary cultures. While fish consumption per capita was determined to be 5.4 kg in low-income, food-deficient countries in 2019, it was 15.2 kg in middle-income countries and 26.5 kg in high-income countries (FAO, 2022; AEPDI, 2023). In Türkiye, per capita seafood consumption was 6.7 kg in 2020, while the world average was 22 kg. Consumption quantity, consumption habits, seafood production quantity and price, and consumer purchasing power are all factors associated with seafood consumption. Although seafood consumption varies by region in Türkiye, per capita annual seafood consumption increased by 12% to 7.3 kg in 2022 compared to the previous year (Figure 1).

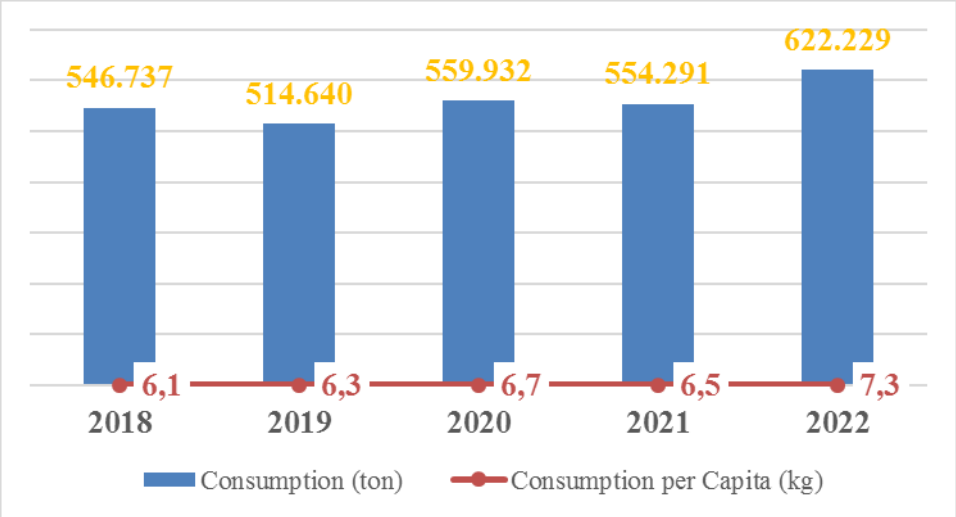

Figure 1: Seafood consumption quantities in Türkiye

The reasons for knowing teachers' fish consumption preferences can be listed as follows:

1. Importance for Health: Fish is rich in omega-3 fatty acids, protein, and various vitamins and minerals. For individuals working in demanding professions like teachers, maintaining a balanced diet is important for sustaining a healthy lifestyle. Knowing fish consumption preferences can contribute to the development of healthy nutrition programs and policies.

2. Education and Awareness: Teachers play a crucial role in imparting knowledge to students and the wider community. Having accurate information about fish consumption enables them to educate students and parents about the importance of fish in their diet. They can also serve as good role models for instilling healthy eating habits in students.

3. Environmental Awareness and Sustainability: The significance of fish consumption extends to the realm of marine resource sustainability. Certain fish species face endangerment attributable to overfishing and environmental perturbations. Awareness of teachers' preferences regarding fish consumption holds potential to engender heightened consciousness and advocacy for sustainable fishing methodologies, thereby fostering the preservation of natural resources.

4. Nutrition Programs and School Menus: Nutrition programs and school menus play a pivotal role in fostering healthy dietary habits among students. In the strategic development of these initiatives, consideration of teachers' preferences for fish consumption can offer valuable insights. Incorporating such preferences into the planning of school menus and nutrition programs facilitates the provision of a diversified and healthful diet for students.

5. Social Impact and Role Modeling: Teachers hold a significant societal role as influential figures. Their embodiment of healthy lifestyles and dietary habits can wield a positive influence on both students and their families. Awareness of teachers' preferences regarding fish consumption empowers them to assume leadership roles within the community, fostering a culture of wellness and nutritional conscientiousness.

For the aforementioned rationales, comprehending the fish consumption predilections of educators holds considerable significance across multiple domains encompassing health, education, environmental consciousness, and societal ramifications.

Although the preferences for fish consumption among teachers may exhibit variability contingent upon individual inclinations and dietary practices, it is discernible that certain educators favor fish as a viable source of nutritious protein. Due to the omega-3 fatty acids and other nutritious elements it contains, fish is particularly popular among individuals who adopt a healthy lifestyle. While some teachers regularly include fish in their weekly menus, others may consume it less frequently or prefer certain types. Furthermore, cultural, and geographical disparities can exert notable influence on preferences regarding fish consumption. For instance, educators residing in coastal regions may manifest an increased propensity for fish consumption attributable to enhanced accessibility to seafood resources.

The present investigation was undertaken with the aim of delineating the socio-demographic and economic attributes, monthly expenditure patterns, as well as preferences pertaining to meat and fish consumption among teachers working in Bingöl Province. Moreover, the study endeavors to elucidate the factors exerting influence on the consumption of fish within this cohort. The materials utilized in this study were procured from a combination of primary and secondary sources. Primary data encompassed information collected directly from teachers employed in Bingöl. In contrast, secondary data were sourced from a diverse array of domestic and international outlets, including public institutions, scholarly journals, and pre-existing publications.

MATERIAL AND METHOD

The study was conducted by face-to-face interviews with 359 randomly selected teachers working in the city center of Bingöl between May 2023 and July 2023. The “interviews” questionnaire consisted of 31 questions aimed at determining participants' socio-economic status, seafood consumption behaviors, types and quantities consumed, reasons for preferences, and sources of seafood procurement.

The number of surveys to be conducted was determined using the limited population formula, utilizing data obtained from the Bingöl Provincial Directorate of National Education records (Miran, 2002).

$$n = (N.p.q)/(N-1)\sigma^2 p + p.q\ )$$

The formula used for determining the sample size was based on the following parameters:

$\sigma^2 p$ = Variance of the proportion

n = Sample size

N = Total population size

p = Proportion (set as \(p = 0.5 \))

\(p = 0.5 \) was chosen to maximize the sample size and determine an appropriate sample size since the characteristics of the population were initially unknown, The sample size was determined to be 356 with a confidence level of 95% and a margin of error of 5%.

The statistical methods used for the analysis of survey data in SPSS 16.0 are detailed below:

- Frequency Tables: Used to observe the distribution of variables, indicating the number of observations in each category.

- Pie and Bar Charts: Provide a visual representation of data, displaying the proportions and distributions of categorical variables.

- Chi-Square Test: Determines the relationship between two categorical variables, testing whether the relationship is statistically significant.

- Independent Samples t-Test: Used to determine whether the difference between means of two groups is statistically significant.

- One-Way Analysis of Variance (ANOVA): Used to determine whether the means among three or more groups are statistically significant. Post-hoc tests like the Duncan test can be used to identify which groups differ from others. Duncan test is a post-hoc test used for comparing the means of different groups after ANOVA, showing which groups are statistically different from others.

RESULTS AND DISCUSSIONS

Distribution of Surveyed Teachers by Branches

Teachers usually specialize in certain branches and teach according to these branches. The following groups were taken into account when determining the distribution of teachers participating in the survey according to their branches: mathematics teachers, science (Biology, Physics, Chemistry) teachers, Turkish and literature teachers, social studies teachers, English and other foreign language teachers, visual arts and music teachers, physical education teachers, vocational courses teachers and guidance and psychological counseling teachers. Of the teachers participating in the survey, 24.5% were classroom teachers, 15.8% were science teachers, 10.9% were social studies, 8.8% were pre-school teachers, 7.6% were mathematics teachers, and 7.3% were English and other foreign languages teachers, 7% were Turkish and literature teachers 5.2% were religious culture and moral knowledge teachers, 4.8% were vocational courses teachers, 3.3% were guidance and psychological counseling teachers, 3% were visual arts and music teachers, and 1.8% were physical education teachers (Table 1). In the study conducted by Sabbağ (2003), it was determined that 57.4% of the teachers surveyed were classroom teachers and 19.1% were Turkish teachers. In the study conducted by Güleç (2015), it was found that 15% of the teachers surveyed were in the science branch. In the study conducted by Gül and Özay Köse (2015), it was concluded that all the teacher candidates surveyed were in the science

branch. In the study conducted by Gökçen et al. (2021), it was stated that a high percentage (18%) of the teachers who participated in the survey were classroom teachers. In the study conducted by Şen et al. (2023) in Ankara, it was found that 26.1% of the teachers who participated in the survey were classroom teachers.

Table 1: Distribution of the branches of the surveyed teachers

Branch	Number	Percentage
Mathematics	25	7.6
Science	52	15.8
Turkish Language and Literature	23	7.0
Social Studies	36	10.9
English and Other Foreign Languages	24	7.3
Visual Arts and Music	10	3.0
Physical Education	6	1.8
Vocational	16	4.8
Guidance and Psychological Counseling	11	3.3
Classroom Teacher	81	24.5
Religious Culture and Moral Knowledge	17	5.2
Pre-school	29	8.8
Total	330	100

Socio-Demographic and Economic Characteristics of the Teachers Surveyed

The proportional distribution of some socio-demographic and economic characteristics of the surveyed teachers is given in Table 2. 58.7% of the teachers surveyed were male and 41.3% were female. The rate of teachers under the age of 30 was 24.1%, the rate of teachers between the ages of 31-50 was 72.8%, and the rate of teachers over the age of 51 was 3.1%. The average age of the teachers participating in the survey was calculated as 35.5. Considering the education level of the teachers, most of them (79.7%) had a bachelor's degree, 19.2% had a master's degree and 1.1% had a doctorate. It was found that in 14.6% of the teachers surveyed the number of family members was two or less, in 58.2% it was three or four people, and in 27.2% it was five or more people. The average number of members in the family was calculated as 3.93 people. The rate of single teachers was 27.6%, the rate of married teachers (their spouses were working) was 49.1%, and the rate of married teachers (their spouses were not working) was 22.3%. It was determined that the surveyed teachers lived in Bingöl for an average of 20.4 years and taught for an average of 10.9 years. The average monthly net household income is calculated as 23984.596 ₺, the average monthly expenses are 14906.215 ₺, and the average monthly food expenses are 5783.475 ₺. It was identified that a very small portion of the teachers surveyed (0.8%, a retired teacher) had an income below the minimum wage. According to Turkish Statistical Institute (TSI) 2023 data; the amount of calories each family member needs to consume for a healthy diet varies. The monthly amount of food that an adult male should consume for a healthy and balanced diet is 3191 ₺. This value is calculated as 3031 ₺ for an adult female, 3235 ₺ for a young person aged 15-18, and 2609 ₺ for a child aged 4-6. The cost of a healthy diet to the total family budget is 11525 ₺ (TSI, 2023). This amount is the mandatory expenditure that the family in question must make only for food. Including expenses such as education, health, accommodation, entertainment, heating and transportation, the amount a family needs to spend reaches 39 thousand 886 ₺. It was concluded that 26% of the teachers surveyed were on the hunger line and 64.9% were on the poverty line. In the study conducted by Sabbağ (2003), it was found that 85.8% of the teachers surveyed were in the 30-49 age group, 87.6% were married and 55% had a working period between 1-15 years. In the study conducted by Güleç (2015), it was concluded that 52.6% of the teachers surveyed were male, 81% were under 40 years old, 67.6% were married and 86% had a bachelor's degree. In another study, it was stated that 58.7% of the teachers surveyed were women (Karaca, 2013). In the study conducted by Gündoğdu (2009), the rate of married ones participating in the survey was 75.5% and the rate of those with a bachelor's degree was 72%. In the study conducted by Gül and Özay Köse (2015), it was determined that 68.8% of the teacher candidates surveyed were female and 31.2% were male. In the study conducted by Gökçen et al. (2021), it was determined that 52.5% of the teachers participating in the survey were between the ages of 31-40, 82.6% had a bachelor's degree, and 56% had a service period of 6-15 years. In a study conducted by Şen et al. (2023) in Ankara, it was concluded that approximately 63% of the teachers participating in the survey were younger than 40 years, 59.1% were women, 52.5% were married and 84.2% had a bachelor's degree. In the study conducted by Güneş et al. (2023), it was indicated that, on average, 61.6% of the surveyed university staff's spouses were working, while 38.4% were not working. It is expected that the spouse's employment rate would be high because the study was conducted with teachers, and they usually met and got married during their working lives. In this respect, the findings of Güneş et al.'s (2023) study are similar to the findings of this study.

Table 2: Distribution of socio-demographic and economic characteristics of surveyed teachers

Characteristics	Percentage (%)
Gender	
Male	58.7
Female	41.3
Age Group	
≤30	24.1
31-50	72.8
≥51	3.1
Mean	35.5
Educational Status	
Bachelor's Degree	79.7
Master's Degree	19.2
Doctorate Degree	1.1
Family Size	
≤2	14.6
3-4	58.2
≥5	27.2
Mean	3.93
Marital Status	
Single	27.6
Married (Spouse Works)	49.1
Married (Spouse Doesn't Work)	22.3
Duration of Residence in Bingöl (years)	
≤10	40.1
11-30	27.6
≥31	32.3
Mean	20.4
Teaching Experience (years)	
≤10	55.2
11-20	37.4
≥21	7.4
Mean	10.9
Monthly Net Household Income (₺)	
≤8506*	0.8
8507- 20000	50.4
≥20001	48.8
Mean	23984.596
Monthly Average Expenses (₺)	
≤8864**	26
8865-28875***	64.9
≥28876	9.1
Mean	14906.215
Monthly Food Expenses (₺)	
≤3200****	25.6
3201-10000	70.7
≥10001	3.7
Mean	5783.475

Surveyed Teachers' Average Monthly Food and Fish Expenditures

The average values of total expenditure, food expenditure, fish expenditure and the share of food expenditure in total expenditure, the share of fish expenditure in food expenditure and the share of fish expenditure in total expenditure by income groups of the surveyed teachers are given proportionally in Table 3. While the average total expenditure value was determined as 14906.215 ₺, the difference between the total expenditure values by income groups was statistically significant. It was identified that the total expenditure of the teachers in the 3rd group was the highest, the teachers in the 2nd group were in second place, and the teachers in the 1st group had the lowest total expenditure. The average monthly food expenditure of the surveyed teachers was found as 5783.475₺. Monthly food expenditure was determined as the lowest value in the 1st income group with 2333.333 ₺ and the highest value in the 3rd group with 6428.324 ₺. It was calculated that fish expenditure varies between 50₺ and 454.81₺ and the average monthly fish expenditure for all income groups is 436.57₺. According to Table 3, the share of the surveyed teachers' total expenditures in their income was 62.15%, the share of food expenditures in their income was 24.11%, and the share of fish expenditures in their income was 1.82%. The share of food expenditures in total expenditures was calculated as 38.80%, the share of fish expenditures in total expenditures was 2.93% and the share of fish expenditures in food expenditures was determined as 7.55%. In a study conducted in the urban area of Tokat province, the average monthly income was determined as 1608.71 ₺, the average monthly consumption expenditure was 1186.21 ₺ and the average food expenditure was 492.63 ₺ (Karakaş, 2010). In a study carried out in Aydın, the average monthly income was determined as 1805.41 ₺, the average monthly consumption expenditure was 1219.36 ₺ and the average food expenditure was 494.50 ₺ (Ulaş, 2011). In the study conducted by Akbay et al.

(2013), the ratio of monthly seafood consumption expenditures in total food expenditures was determined as 0.78% in the lowest income group, 1.62% in the highest income group, and the Türkiye average was 1.17%. In the study carried out by Nalinci (2013) in Amasya; it was determined that the average monthly income of the individuals surveyed was 2026.59 ₺, their average expenditure was 1462.51 ₺, their average food expenditure was 426.96 ₺. Further, 29.2% of their average monthly expenditure was food expenditure and 70.8% was other expenditures. According to TSI (2014) household budget research, it was reported that the average monthly consumption expenditure per household is 2848.00 ₺ and 19.7% of the expenditure consists of food and non-alcoholic beverages. In the study conducted by İnci et al. (2014) in Bingöl, the average monthly income was calculated as 2183.12 ₺ and the average monthly food expenditure was calculated as 486.0 ₺. In another study conducted in Bingöl, the ratio of monthly average food expenditure to monthly average income was calculated as 22.2% (Karakaya et al., 2014). In the study conducted by Karakaya and Kırıcı (2016) in Bingöl, the average fish expenditure of households was calculated as 105.52 ₺/month. According to the 2022 results of the Household Budget Survey while food and non-alcoholic beverage expenditures have the highest share in consumption expenditures of households across Türkiye with 22.8%, housing and rent expenditures take the second place with 22.4%, and transportation expenditures take the third place with 21.3% (TSI, 2022). In the same study, the average monthly consumption expenditure was estimated as 12,159 ₺ per household and 6,259 ₺ per equivalent individual, and it was determined that low-income households allocate more than twice as much to food as high-income households. In a study conducted in Hakkari, the average monthly fish consumption expenditure was calculated as 116.9 ₺ per household (Terin and İnaç, 2023). In a study conducted on university personnel in Erzincan, according to general averages, the share of total expenditure in income is 81.4%, the ratio of food expenditure in total expenditure is 38.4%, and the ratio of fish expenditure in total food expenditure is 3.38%. In a study conducted in Bingöl, the share of food expenditure in total income was determined as 24.6% (Karakaya and Kızıloğlu 2017). According to the data of a study conducted in 26 sub-regional provinces in Türkiye in 2018, the share of food expenditure in monthly expenditure was calculated as 26.9% (Anonymous, 2018). Karakaya and İnci (2020) calculated the share of monthly food expenditure in monthly average income as 28.7%. In a study by Söğüt et al. (2020), the average monthly income of consumers was calculated as 3661.4 ₺, the average food expenditure was 503.2 ₺, and the ratio of monthly food expenditure in total monthly expenditures was calculated as 18.8%.

Table 3: Total Expenditure, Food Expenditure, Fish Expenditure, and Proportions of Expenditures by Income Groups

Income Group (₺)	First group (≤8506)	Second group (8507-20000)	Third group (≥20001)	Mean
Net income (A)	5333.333[a]	16954.758[b]	31541.040[c]	23984.596
Total expenditure (₺) (B)	4166.667[a]	11490.449[b]	18606.936[c]	14906.215
Food expenditure (₺) (C)	2333.333[a]	5214.888[ab]	6428.324[b]	5783.475
Fish expenditure (₺) (D)	50.00	426.13	454.81	436.57
Ratio (%) B/A	78.12	67.77	58.99	62.15
Ratio (%) C/A	43.75	30.76	20.38	24.11
Ratio(%) D/A	0.94	2.51	1.44	1.82
Ratio (%) C/B	56.00	45.38	34.55	38.80
Ratio (%) D/B	1.20	3.71	2.44	2.93
Ratio (%) D/C	2.14	8.17	7.08	7.55

[a,b,c]: The difference between different letters in the same line is statistically significant ($p \leq 0.05$)

Types of Meat Consumed by the Surveyed Teachers and Monthly Fish Consumption Amount

It was determined that 48.7% of the surveyed teachers consumed red meat, 31.4% consumed white meat, 13.6% consumed all types of meat, 5.1% consumed fish, and 1.1% did not consume meat. In a study conducted in Uşak, participants' preferences were primarily red meat (23.5%), followed by chicken (18.9%), fish (15.5%), and all types of meat (36%), with 6% not consuming meat (Kuşat and Şahan, 2021). In another study in Bingöl, it was found that 83.5% of surveyed individuals consumed fish (Karakaya and Kırıcı, 2016). In a study conducted in Erzincan, it was found that 10.9% of participants consumed fish (Karakaya et al., 2020). In other studies, fish consumption rates for individuals were as follows: Van, 92.9% (Terin and Keskin, 2021), Croatia, 87.2% (Tomic et al., 2016), Mardin, 77.75% (Kaplan et al., 2019), Ağrı, 86.45% (Gürel et al., 2017), Yozgat, 82.0% (Erdoğan Sağlam and Samsun, 2018), and Çanakkale, 94.4% (Selvi et al., 2022). Based on these results, it can be claimed that the fish consumption rate in the study area is lower compared to other studies.

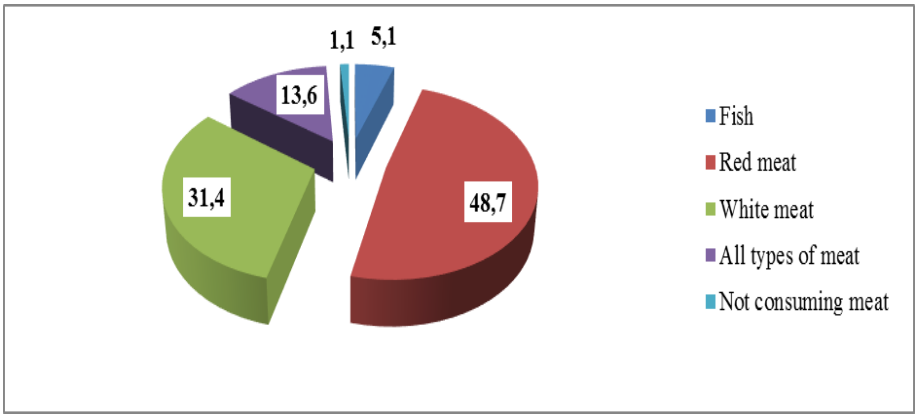

Figure 2: Type of meat consumed by the surveyed teachers (%)

Monthly fish consumption amount of the surveyed teachers: It was found that the annual fish consumption amount varied between 1 kg and 2.66 kg and the average was 2.54 kg. Further, the annual fish consumption amount varied between 12 kg and 31.92 kg and the average was 30.48 kg (Table 4). It was concluded that both monthly and annual fish consumption amounts increase by income groups, and with the increase in teachers' incomes, fish consumption amounts also increase. The general average amount of fish consumption per capita is calculated as 7.75 kg/year. The proportion of fish meat in total meat consumption was determined as 26.6% in the 1st income group, 12.7% in the 2nd income group and 13.3% in the 3rd income group. When we look at the fish consumption amount of the surveyed teachers by gender, the average fish consumption amount of men was determined as 2.64 kg, and that of female teachers was 2.36 kg (Table 5). The difference between the average fish consumption amount of male and female teachers was not statistically significant as a result of the t-test. In the study carried out by Karakaya and Kırıcı (2016) in Bingöl, the average fish consumption amount of households was calculated as 4.88 kg/month and the average fish consumption amount per person was calculated as 12.2 kg/year. Further, it was stated that individuals in the high-income group were more likely to consume more fish than individuals in the low- and middle-income group. It was also concluded that they consumed more fish than singles. In a study carried out in Hakkari, the monthly average fish consumption amount per household was calculated as 3.39 kg (Terin and İnaç, 2023). In a study carried out by Küçük et al. (2022) in Osmaniye, 48.5% of the respondents reported 1-3 kg per month and 28.9% 4-6 kg. In the study conducted by Yüksel and Diler (2019) in Ankara, 35.9% of the participants reported 1-3 kg per month and 27.1% less than 1 kg. In a study carried out by Karakaya et al. (2020) in Erzincan, 83.0% of consumers reported 1-3 kg per month. In a study by Türkmen et al. (2016) in Giresun, it was determined that 25.23% of the consumers consumed 8-10 kg of fish, and in the study conducted by Temel (2014) in Rize, 26.11% of the households consumed 6-11 kg of fish per month. According to these results, the fact that fish consumption is high in coastal provinces and low in landlocked and remote areas is compatible with expectations and literature. In the study conducted by Terin and İnaç (2023), it was concluded that whether the individual participating in the survey was male or female did not affect the statistical significance of the difference between the monthly average fish consumption amounts. Income is an important factor that determines the type and level of goods and services purchased, and when income increases, people buy more goods and services (Jensen, 2006). In a study conducted in Hakkari, the difference between income groups and monthly fish consumption amounts was found to be statistically significant and it was concluded that as income increases, the average monthly amount of fish consumed also increases (Terin and İnaç 2023). Some previous studies on the subject have also determined that income positively affects fish consumption (Cavaliere et al., 2019; Lee and Nam, 2019; Govzman et al., 2021; Kresic et al., 2022). It was determined by Güneş et al. (2023) that the average monthly fish consumption of university staff in Erzincan was 1.81 kg.

Table 4: Fish consumption amounts of surveyed teachers by income groups

Income groups (₺)	≤8506	8507-20000	≥20001	Mean
Monthly fish consumption amount (kg)	1	2.44	2.66	2.54
Annual fish consumption amount (kg)	12	29.28	31.92	30.48
Number of households (person)	3.33	4.01	3.86	3.93
Fish consumption amount per capita (kg/year)	3.60	7.30	8.26	7.75
Proportion of fish in total meat consumption (%)	26.6	12.7	13.3	13.1

Surveyed Teachers' Fish Consumption Frequency

The relationship between the frequency of fish consumption in summer and winter by the surveyed teachers' gender, marital status and income level is given in Table 5 and Table 6. There was no statistically significant relationship between the frequency of fish consumption in winter and summer, depending on the gender of the teachers. It was determined that teachers, depending on gender, consume fish at a higher rate, once a month in winter and on special occasions in summer. It was concluded that especially all female teachers consumed fish in winter. There was a statistically significant relationship between the frequency of fish consumption of teachers in terms of marital status. Also, the frequency of fish consumption once a month was higher in winter. Further, married teachers whose spouses did not work consumed fish once a month at a higher rate. Teachers generally consumed fish at a high rate once a month during the winter months according to their income level, and all teachers, especially

those in the low and high-income groups, consumed fish during the winter months. The rates of fish consumption frequency of teachers in the low-income group weekly, once every 15 days and once a month were determined as equal and 33.3%. The frequency of fish consumption in winter does not depend on the income level of teachers. Considering all the characteristics of the teachers examined, it was determined that the frequency of fish consumption in the summer months was high on special occasions and this situation was not statistically significant. It can be concluded that the frequency of fish consumption of teachers increases more in the winter months. In the study conducted by Kuşat and Şahan (2021) in Uşak, it was pointed out that the fish consumption frequency of the participants was high (38.1%) in once a week. In the study conducted by Karakaya et al. (2020) in Erzincan, it was reported that fish was consumed mostly during the winter months and every fifteen days. In a study conducted in Hakkari, the relationship between working housewives and the frequency of fish consumption was found to be statistically significant at the 1% level According to this result, it can be claimed that the frequency of fish consumption is higher in families where the housewife works (Terin and İnaç, 2023). Similar result was found in studies conducted by Terin (2019). In the study conducted by Terin and İnaç (2023), it was concluded that there is no statistically significant relationship between the gender of individuals and the frequency of fish consumption. In the study conducted on university personnel in Erzincan, it was inferred that the general average of fish was consumed 30.3% every 15 days in winter and 42.5% on special occasions in summer (Güneş et al., 2023).

Table 5: Fish consumption amounts of surveyed teachers by gender

Gender	Mean	Std. Deviation	Std. Error Mean
Male	2.6430	3.60807	0.25017
Female	2.3646	2.52555	0.21046
T and p-value		0.800 ve 0.424	

Table 6: Distribution of fish consumption frequency by some characteristics of teachers

Fish consumption frequency/Variables	Gender			Marital status				Income level (₺/month)			
	Female	Male	Mean	Married (spouse works)	Married (spouse does not work)	Single	Mean	≤8506	8507-20000	≥20001	Mean
In winter months (%)											
Weekly	21.8	24.9	23.6	28.4	22.5	16.2	23.6	33.3	18.5	28.9	23.7
Every 15 days	12.9	16.7	15.2	14.2	22.5	11.1	15.2	33.3	13.5	16.8	15.3
Once a month	32	36.8	34.8	36.4	40	28.3	34.8	33.3	34.3	35.3	34.7
On special days	33.3	21.1	26.1	21	15	43.4	26.1	0	33.1	19.1	26
Not at all	0	0.5	0.3	0	0	1.0	0.3	0	0.6	0	0.3
$\chi 2$ ve p	7.458 ve 0.114			32.375 ve 0.001**				13.840 ve 0.086			
In summer (%)											
Weekly	2	3.8	3.1	3.4	3.8	2	3.1	0	2.8	3.5	3.1
Every 15 days	4.8	5.7	5.3	4.5	8.8	4	5.3	0	5.6	5.2	5.4
Once a month	29.9	26.3	27.8	29	26.3	27.3	27.8	0	24.7	31.2	27.7
On special days	47.6	49.3	48.6	44.9	43.8	58.6	48.6	66.7	53.4	43.9	48.9
Not at all	15.6	14.9	15.2	18.2	17.5	8.1	15.2	33.3	13.5	16.2	15
$\chi 2$ ve p	3.094 ve 0.686			19.079 ve 0.210				7.999 ve 0.629			

**: p≤0.05; ≤8506: Low-income group; 8507-20000: middle income group; ≥20001: high income groups

Surveyed Teachers' Reasons for Fish Consumption

Among the reasons for fish consumption reported by teachers, the highest proportion (39.1%) indicated that they consumed fish because of its high nutritional value, followed by 28.6% who cited "other reasons" and 26.6% who mentioned the delicious taste. Reasons such as affordability, availability, and habit were not considered significant factors in fish consumption by teachers (Figure 3). In a study conducted in Erzincan, it was found that the primary reason for fish consumption was its high nutritional value (Karakaya et al., 2020). Another study in Erzincan revealed that a significant portion of university staff preferred fish due to its nutritional value (Güneş et al., 2023).

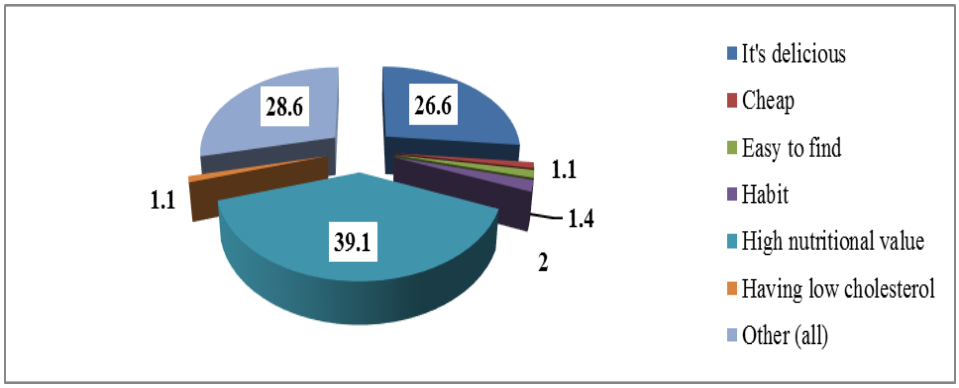

Figure 3: Reason for fish consumption of the surveyed teachers (%)

Surveyed Teachers' Opinions about Easy Access to Fish and Fish Prices

Among the surveyed teachers 56.5% could easily access the fish they wanted when purchasing fish, while 43.5% faced difficulties in finding the desired fish and accessing it. Regarding fish prices, 48.4% of teachers found them expensive, 32.6% found them very expensive, 18.8% found them normal, and only 0.2% found them cheap. All participants agreed that fish prices were not very cheap (Figure 4). In a study conducted in Hakkâri, 85.2% of individuals reported difficulty in finding a sufficient variety and quantity of fish, 91.4% mentioned a lack of adequate fish sales points, and 93.7% indicated insufficient restaurants where they could eat fish (Terin and Inaç, 2023). In another study in Kastamonu, 75.7% of consumers faced difficulty accessing a sufficient variety and quantity of seafood (Dilek et al., 2019), while in Siirt, 64.2% reported being unable to find the desired fish in the market (Kırıcı et al., 2018). The results of this study are consistent with those of other similar studies. In a study by Güneş et al. (2023), it was found that, on average, 48.5% of participants considered fish prices expensive. Previous studies showed varying perceptions of fish prices, with some considering them cheap or normal (Abdikoğlu et al., 2015; Karakaya and Kırıcı, 2016; Kırıcı et al., 2018; Bayraktar et al., 2019) and others finding them expensive (Ercan and Şahin, 2016; Karakaya et al., 2020). In another study, 51.5% of respondents reported easy access to fish when purchasing or consuming it, while 48.5% found it difficult to access (Güneş et al., 2023).

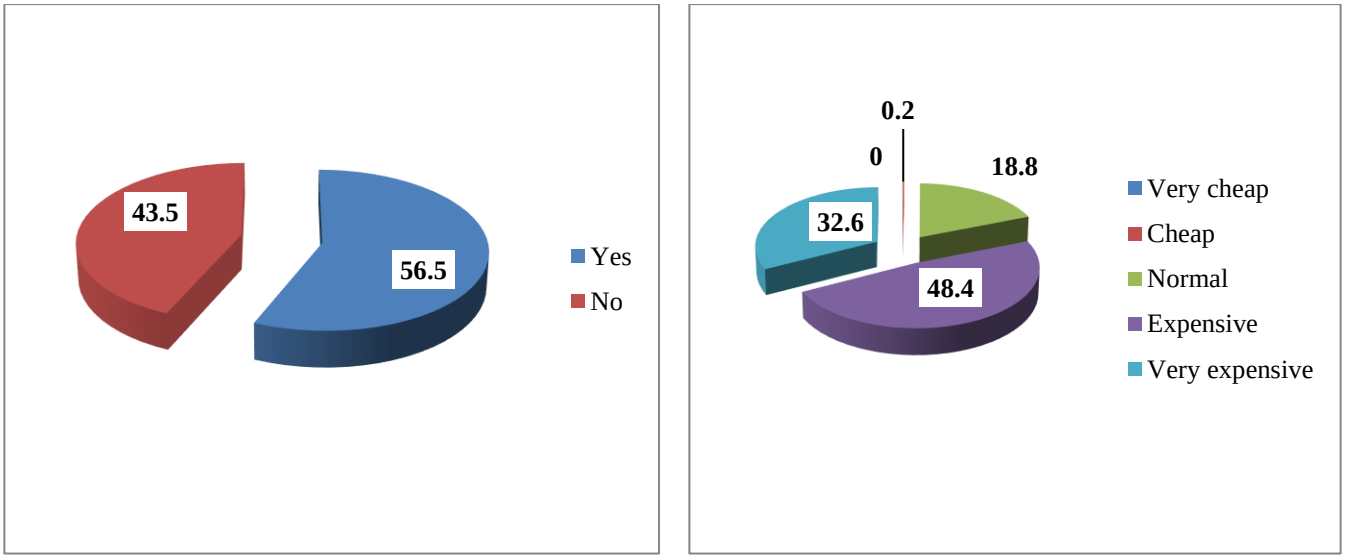

Figure 4: Opinions about easy access to fish and its prices when purchasing fish (%)

Surveyed Teachers' Fish Purchasing Method and the Most Considered Criteria

The depiction in Figure 5 delineates the numerical distribution of responses about the procurement practices of teachers in acquiring fish, along with the evaluative criteria they employ during the purchasing process. The total exceeds 100% since teachers could select multiple responses. The number of teachers who buy fish fresh was 316, frozen was 41, and canned was 22. There were no teachers who purchased salted fish. Regarding the criteria considered when buying fish, 275 teachers considered freshness, 108 considered nutritional value, 55 considered taste, and 48 considered price. In a study conducted in Erzincan, it was found that the high nutritional value of fish was the most preferred reason for consuming fish (Karakaya et al., 2020). Terin and Inaç (2023) reported that 94.5% of individuals preferred to consume fish fresh, 3.2% frozen, and 2.3% canned, which is consistent with the literature indicating that most consumers prefer fresh fish. Studies showed that the rate of fresh fish consumption is 98.6% (Türkmen et al., 2016), 94.0% (Cengiz and Özoğul, 2019), 90.6% (Selvi et al., 2022), 83.6% (Dilek et al., 2019), 98.1% (Genç et al., 2020), 87.2% (Terin et al., 2016), 82.2% (Kuşat and Şahan, 2021), and 85.12% (Perez-Ramirez et al., 2015). The results of this study are consistent with other studies. In a study conducted in Van, 53.5% of households considered freshness

when buying fish, 15.9% considered price, and 14.8% considered the cleanliness of the sales point (Terin et al., 2016). In Izmir, 85.2% considered freshness, 59.5% considered the cleanliness of the sales point, and 45.5% considered price (Çaylak et al., 2019). In Osmaniye, 73% considered freshness, 12.4% considered the type, and 11.4% considered price (Küçük et al., 2022). In Uşak, 68.6% considered freshness, 11.7% considered the type, and 11.3% considered price (Kuşat and Şahan, 2021). In a study conducted in Mexico, 50.96% considered freshness, 22.31% considered protein content, 18.73% considered taste, and 7.71% considered price (Perez-Ramirez et al., 2015) as the most important purchasing criteria. In a study conducted in Erzincan by Güneş et al. (2023), it was found that 89.5% of respondents generally purchased fish fresh, and 87% paid attention to freshness when buying fish, particularly by assessing the overall appearance and eye-related characteristics of the fish. It was reported in many studies that consumers pay attention to whether the fish is fresh when purchasing it and assess its overall appearance and eye-related characteristics to determine freshness (Adıgüzel et al., 2009; Abdikoğlu et al., 2015; Azabağaoğlu et al., 2016; Bayraktar et al., 2019). The results of the study are in line with previous studies.

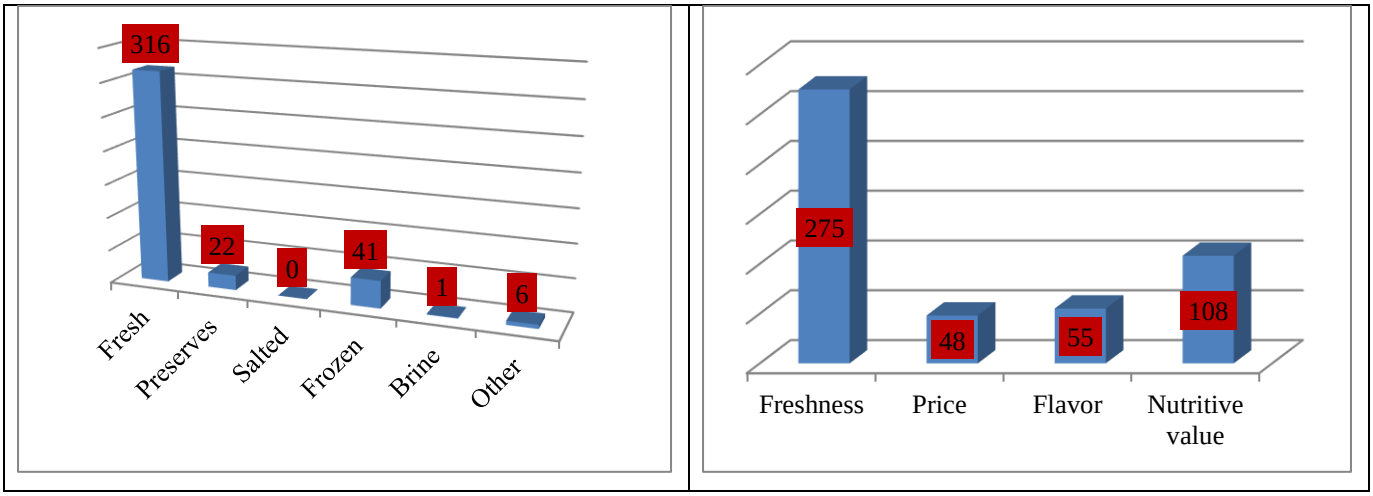

Figure 5: The way of purchasing fish and the most important criteria when purchasing (Surveyed teachers were allowed to choose more than one option)

Opinions of the Surveyed Teachers on the Way of Fish Consumption, the Type of Fish Consumed, the Season in which They Consume More Fish, Where They Purchase the Fish, and Whether Fish Consumption Is Enough or Not.

The number and ratio values of the surveyed teachers' opinions about the way they consume fish, the type of fish they consume, the season in which they consume more fish, the place they buy the fish, and whether their fish consumption is sufficient are given in Table 7. When asked how they cook the fish, a high percentage (57.9%) of the surveyed teachers answered the oven, 42.1% responded to the question of the type of fish consumed mostly by trout, and 79.2% responded to the question of the season in which fish is consumed most by winter. Further, (60.4% of the teachers responded to the question of where the fish is purchased as fixed sellers and when asked if they think they consume enough fish, a high percentage (38.2%) answered "not enough". According to experts, it is recommended to grill, bake and steam fish (Anonymous, 2016; Terin and İnaç, 2023). In the study conducted in Hakkari, it was determined that 40.9% of individuals prefer to fry fish, 30.5% prefer to bake it in the oven, and 28.6% prefer to cook it on the grill (Terin and İnaç, 2023). In the study carried out in Giresun, 51.50% of the consumers preferred fried, 19.04% grilled, 19.91% steamed and 6.92% cooked in the oven (Türkmen et al., 2016). In the study conducted in Adana and Mersin, 43.2% of the individuals preferred fried and 39.9% grilled (Cengiz and Özoğul, 2019). Further, in the study conducted in Van, 40.2% of the households fry the fish, 34.2% use the oven and 23.6% grill (Terin et al., 2016). In a study in Konya, it was determined that 60.0% of the consumers preferred to cook by frying, 20.0% by grilling and 13.0% by steaming (Bolat and Cevher, 2018). It can be claimed that our study results are similar to the results of other studies. In studies conducted in different provinces of Türkiye and abroad, the most preferred fish varieties are as follows; anchovy, trout, and pearl mullet in Van (Sarı et al., 2000; Güngör, 2014; Terin et al., 2016), anchovy in Siirt. 42.1%, trout 23.6% (Kırıcı et al., 2018), in Yozgat, anchovy 94% (Erdoğan Sağlam and Samsun, 2018) in Malatya, anchovy 38% and trout 22% (Yücel et al., 2020) in Erzurum, anchovy 55.1%, trout 22.1% (Karakulak et al., 2020) in Sinop, anchovy 48%, whiting 18% (Yücel et al., 2020), in Osmaniye, anchovy 36.1%, bream 25.8%, sea bass 23.5% (Küçük et al., 2022) sea bream 40.4%, sea bass 34.2% and horse mackerel 32.4% in Izmir (Çaylak et al., 2019), 24.24% horse mackerel, 16.66% anchovy and 15.73% tuna in Togo (Che et al., 2022) and in Ghana 31.3% mackerel, 28.7% sardines and 11.5% sea bream (Onumah et al., 2020). In the study conducted by Kuşat and Şahan (2021) in Uşak, it was determined that although the consumption of marine fish was not high, the most consumed species was anchovy, and the participants consumed the fish mostly in the winter months (79.1%) and bought it from public markets. In a study conducted in Erzincan, the reason for fish consumption was its high nutritional value, as the most consumed fish type; Anchovy (*Engraulis encrasicolus*) and pan cooking method was preferred for cooking (Karakaya et al., 2020). In the study conducted by Terin and İnaç (2023) in Hakkari, the most preferred sea and freshwater fish were anchovy and trout respectively, a significant portion of individuals preferred to consume fish fresh and fried, and a significant portion of individuals consumed fish, but the amount of fish consumed was insufficient. Seasonality is an important factor in fish consumption. In general, it can be claimed that fish is consumed more in autumn and winter. Many studies confirm this result. In the study conducted by Terin and İnaç (2023), it was determined that individuals consumed the most fish in winter (67.2%) and autumn (16.4%). In similar studies, the rate of fish

consumption in winter months is 60.2% in Ankara (Yüksel and Diler, 2019), 78.74% in Giresun (Türkmen et al., 2016), 87.83% in Trabzon (Uzundumlu and Dinçel, 2015), 64.0% in Sinop (Yücel et al., 2020), 53.2% in Osmaniye (Küçük et al., 2022) and 84.1% in Van (Terin et al., 2016). In the study conducted in Van, 68.6% of the households bought the fish from the fisherman, 24.5% from the market and 6.9% from the street vendor (Terin et al., 2016), in the study conducted in Uşak, 58.0% from the market and 33.1% from the fish market (Kuşat and Şahan, 2021). In the study conducted in Siirt, 48.3% from the fisherman, 22.1% from street vendors (Kırıcı et al., 2018), in the study carried out in Mardin, 53.05% from the market, 31.51% from the market. It was found that they bought 100% from the marketplace and 8.36% from street vendors (Kaplan et al., 2019), and in the study conducted in Bangladesh, 60.20% of them were purchased from fish markets and 7.40% from supermarkets (Hoque et al., 2022). It can be concluded that the results of the study are different from the results of other studies, but there is a similar structure in the provinces close to the study area (Van, Siirt, Erzincan).

Table 7: Surveyed teachers' Opinions about the way they consume fish, the type of fish they consume, the season in which they consume more fish, the place where they buy fish, and whether fish consumption is sufficient or not

Variables	Number	Ratio
How fish is consumed*		
Pan	105	29.5
Grill	32	9.0
Oven	206	57.9
Brine	2	0.6
Frying	71	19.9
Steamed	14	3.9
Most consumed fish type*		
Anchovy	120	33.7
Sea bass	45	12.6
Sea bream	71	19.9
Trout	150	42.1
Horse mackerel	10	2.8
Norwegian salmon	30	8.4
Other (creek fish, bonito, carp)	20	5.6
Season in which more fish is consumed		
Spring	8	2.2
Summer	40	11.3
Autumn	26	7.3
Winter	281	79.2
Where the fish is purchased		
I keep it myself	30	8.4
Street seller	45	12.6
Steady seller	215	60.4
Fish breeder	57	16.0
Supermarket	50	14.0
Opinion on whether fish consumption is sufficient or not		
Never/no	132	37.1
Little	136	38.2
Partially	72	20.2
A lot	11	3.1
Quite a lot	4	1.1

*: Total exceeds 100 because more than one option was selected

Surveyed Teachers' Change in Fish Consumption Due to Income Increase or Decrease in Fish Prices

On average, 66.9% of the surveyed teachers expressed that their fish consumption would increase when their income increased, while 33.1% indicated that despite an increase in income, their fish consumption would not increase (Table 8). As a result of a decrease in fish prices, 72.6% of teachers stated that their fish consumption would increase, while 27.4% expressed that their fish consumption would not increase. It was concluded that teachers' tendency to increase fish consumption is more strongly associated with a decrease in fish prices rather than an increase in income. In other words, teachers expect a decrease in fish prices rather than an increase in income to increase their fish consumption. In a study conducted on university staff in Erzincan province, it was found that the tendency to increase fish consumption was associated with an increase in income for administrative staff and with a decrease in fish prices for academic staff (Güneş et al., 2023).

Table 8: Change in fish consumption of surveyed teachers due to an increase in income or decrease in fish prices

Income groups	If your income increases, will your fish consumption increase?	If fish prices decrease, will your fish consumption increase?

	Yes	No	Total	Yes	No	Total
≤8506	100	0	100	100	0	100
8507-20000	71.3	28.7	100	72.5	27.5	100
≥20001	61.8	38.2	100	72.3	27.7	100
Mean	66.9	33.1	100	72.6	27.4	100

Surveyed Teachers' Participation Status in Recommendations Regarding Fish Meat Consumption

The survey conducted among teachers revealed that they strongly agreed with statements such as; "Fish is healthier than red meat," "We must consume meat products to meet our protein needs," "Meat provides a high amount of energy," "Fish contains many organic and inorganic substances," "Omega-3 and Omega-6 fatty acids are most abundant in fish," "Fish is rich in vitamins, minerals, and protein," "We should consume at least 2 servings of fish per week," and "Thanks to fish farms, we can consume fish in every season." On the other hand, they did not agree with statements such as; "Our body does not need meat and meat products for growth and development," "All types of meat have the same nutritional content," "Fish contains only protein," "Fish prices are generally affordable in Türkiye," "Fish farms pollute the environment," "Fish is the most expensive type of meat," and "Fish should not be consumed in the summer." Similarly, in a study conducted by Güneş et al. (2023) among university staff, it was found that participants strongly agreed with statements such as "Fish is healthier than red meat," "We must consume meat to meet our protein needs," "Meat provides a high amount of energy," "Fish contains many organic and inorganic substances," "Omega-3 and Omega-6 fatty acids are most abundant in fish," "Fish is rich in vitamins, minerals, and protein," and "Thanks to fish farms, we can consume fish in every season." However, they disagreed with statements such as "Our body does not need meat for growth and development," "All types of meat have the same nutritional content," "Fish contains only protein," "Fish prices are generally affordable in Türkiye," "Fish farms pollute the environment," "Fish is the most expensive type of meat," and "Fish should not be consumed in the summer."

Table 9: Participation status of the surveyed teachers in the recommendations regarding fish meat consumption

Suggestions/participation status (%)	1	2	3
Fish meat is healthier than red meat.	64.6	20.8	14.6
We must consume meat products to meet our protein needs.	78.4	5.6	16
Our body does not need meat and meat products for its growth and development.	22.8	10.4	66.9
The nutritional content of all types of meat is the same.	16.9	18.8	64.3
Meat provides a very high amount of energy.	55.9	28.1	16
Fish meat contains many organic and inorganic substances.	62.4	26.9	10.7
Fish contains only protein.	22.2	30	47.8
Fish prices in Türkiye are generally affordable.	17.4	26.7	55.9
Fish farms pollute the environment.	21.3	41.3	37.4
The most expensive type of meat is fish.	19.7	35.1	45.2
Omega 3 and Omega 6 fatty acids are found mostly in fish.	66.3	19.3	14.3
Fish is not consumed in summer.	21.6	26.9	51.4
Fish contains plenty of vitamins, minerals and proteins.	74.2	14.3	11.5
We should consume at least 2 portions of fish a week.	70.5	16	13.5
Thanks to fish farms, we can consume fish in every season.	54.5	30.1	15.4

1: I agree; 2: I am undecided; 3: Disagree

CONCLUSION

The average age of the teachers surveyed was determined to be 35.5 years old. The average number of individuals in the household was calculated as 3.93 people. It was found that the surveyed teachers have been living in Bingöl for an average of 20.4 years and have been teaching for an average of 10.9 years. The average monthly net household income was 23984.596₺, with average monthly expenses amounting to 14906.215₺, and average monthly food expenses totaling 5783.475₺. It was concluded that 26% of the surveyed teachers were below the poverty line, while 64.9% were at the poverty line. While the total expenditure was determined to have an average value of 14906.215₺, the average monthly fish expenditure was calculated as 436.57₺. The portion of total expenditures in relation to income was determined as 62.15%, with food expenses accounting for 24.11% of income, and fish expenses accounting for 1.82% of income. Food expenditure constituted 38.80% of total expenditure, while fish expenditure accounted for 2.93% of total expenditure, and fish expenditure as a portion of food expenditure was determined to be 7.55%. It was observed that nearly half of the surveyed teachers consumed red meat, while only a small portion consumed fish. The monthly fish consumption varied between 1 kg and 2.66 kg, with an average of 2.54 kg while the annual fish consumption ranged from 12 kg to 31.92 kg, with an average of 30.48 kg. It was determined that during the winter, a higher proportion of teachers consumed fish monthly compared to summer or special occasions, especially with all female teachers consuming fish during the winter. There was a statistically significant relationship between marital status and fish consumption frequency, with a higher incidence of monthly fish consumption during the winter, especially among married teachers whose spouses were not employed. It was also observed that teachers generally consumed more fish during the winter, particularly among those in low and high-income groups. It can be concluded that teachers tend to consume more fish during the winter months. Among the reasons for fish consumption, the highest proportion of teachers underlined the high nutritional value, while factors such as affordability, availability, and habit were less significant. More than half of the teachers reported being able to easily access the desired fish when purchasing, while nearly half found fish prices to be expensive, with none stating that fish prices were very cheap. In

conclusion, it was found that the surveyed teachers purchased trout from a fixed vendor during the winter and consumed it by baking, although this consumption amount was not sufficient for their needs. It was concluded that the inclination of the surveyed teachers to increase fish consumption was more closely linked to a decrease in fish prices than an increase in income. In other words, teachers expect a decrease in fish prices rather than an increase in income to increase their fish consumption. The fact that fish consumption in Türkiye lags behind that of developed countries underscores the importance of healthy eating habits and efforts to combat obesity. The emphasis of the World Health Organization on fish and aquatic products demonstrates that these foods are important sources of health. Both health professionals and public institutions have a responsibility to conduct publication studies aimed at increasing fish consumption habits. These publication studies may include providing accurate information to the public about aquatic products, and explaining the reasons for their benefits, and increased consumption. Additionally, various strategies can be developed to change consumption habits, including educational programs, offering a wider range of aquatic products on the market, appropriate pricing policies, and increasing consumer awareness. However, ensuring a sustainable fish supply is also important. Management policies and practices need to be developed to support the sustainability of the fishing industry and the preservation of marine resources. In conclusion, increasing fish consumption in Türkiye is an important step that can have positive effects on health, and various stakeholders need to work together on this issue.

COMPLIANCE WITH ETHICAL STANDARDS

a) Authorship Contributions

All authors contributed equally to the planning, execution, and fieldwork of this study**.**

b) Conflict of Interest Statement

The authors declare they have no conflicts of interest.

c) Ethics Approval

The study titled "Fish Consumption Preferences of Teachers Working in the City Center of Bingöl Province" was found ethically appropriate by the Health Sciences Scientific Research and Publication Ethics Committee (E-33117789-730.08.03-94303).

d) Data Availability

All relevant data is in the article.

e) Funding

No funding was utilized for this study.

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