

The place of red meat consumption in nutrition habits and factors affecting red meat consumption

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Abstract. In addition to being the most important source of animal protein, red meat is important for human nutrition and health with vitamins, minerals antioxidant substances, and various nutritious elements it contains. In the study, it was aimed to determine individuals' red meat consumption habits, purchasing behaviors, and factors affecting consumer decisions. In line with this purpose, a questionnaire was administered to 410 consumers chosen through proportional sampling method with 95% confidence interval and 5% error margin. Whether there was a difference between groups in terms of the discrete variables obtained in the study was revealed through Chi-Square independence test. In measuring the factors that individuals consider regarding the place they purchase red meat according to their income levels, a 5-Point Likert type scale, the lowest score being 1 and the highest score being 5, was used. In addition, individuals' Body Mass Indexes (BMIs) were calculated. The average income level of the individuals was 4,158.21 TL per month, and their average monthly expenditure on food was found as 978.57 TL. The female individuals' mean BMI was determined to be 24.43 ± 4.05 , while it was found to be 26.78 ± 4.19 for male individuals. The average red meat consumption of the participants was found to be 85.85%. It was observed that the income level of the individuals was a factor affecting their amount of red meat consumption. As the level of income increased, so did red meat consumption. In the study, it was determined that the individuals consumed an average of $3,46 \pm 1,86$ kg red meat a month. Red meat being a part of nutrition and consumption habit is the number one factor in consumption preference with a rate of 84.66%. It was followed by the factor of individuals' seeing red meat as necessary for balanced and healthy nutrition with a rate of 68.75%. The most important factor for the individuals' not preferring to consume red meat was determined to be the high cholesterol ingredient in red meat for 87.93% of the participants. The belief that it includes hormones and residues followed this number by 84.48%, finding the price high by 81.03%, doubts about the safety regarding the provision of red meat by 65.52%, not finding red meat delicious by 32.76%, and being vegetarian by 13.79%. The most important factor that individuals considered regarding the place where they purchase red meat was red meat not being controlled by authorities. This was followed by factors such as red meat not being healthy and hygienic, not being delicious, and the possibility of red meat carrying certain animal diseases. Some factors that were believed to affect individuals' consumption of red meat were analyzed. According to analysis results, it was determined that there was a statistically significant relationship between red meat consumption and the individuals' income levels, food expenditures, and their professions. No statistically significant relationship was found between red meat consumption and the individuals' age, education, gender, marital status, and BMI (kg/m^2) of the male and female individuals. In conclusion, it can be claimed that consumption of red meat that is of high quality and contains protein in line with the consumers' preferences in recommended amounts in daily diet will benefit individuals in terms of health. In this context, red meat consumption should be encouraged in a balanced way in line with consumption texture, and necessary measures that will ensure its consumption as an important element of balanced nutrition should be taken.

Key words: Nutrition, red meat, consumer preferences, factors affecting consumption, body mass index

1. Introduction

Adequate and balanced nutrition is important in terms of individuals in society living a healthy life and increasing their economic, social, and cultural welfare levels. Foods such as meat, milk, and eggs, which contain animal proteins, are of outmost importance for adequate and balanced nutrition of humans (1). Meat has long been a central element of nutrition in many societies, and it has historically been regarded as a measure of development and a sign of prosperity in some societies (2). Faostat stated that red meat consumption showed a great variety all across the world (3). He indicated that while red meat constituted an important portion of normal nutrition in the USA and other developed countries, it also contributed to daily energy need by more than 15%, daily protein need by over 40%, and daily fat intake by more than 20%. He also reported that the demand for red meat, red meat production and consumption continued to increase in developed countries along with the increase in current incomes.

Turkey has both the problems of developing countries and developed countries in terms of nutrition. The nutrition status of people varies significantly according to regions, seasons, socio-economic levels, and urban-rural settlements, and it is marked by inequalities. Inequality in the distribution of income is among the leading reasons for this situation (4). It is seen that in underdeveloped countries, the daily food consumption consists of high carbohydrates and low protein content (5). As well as being the most important source of animal protein, red meat is important for human health with the vitamins, minerals, antioxidant substances various nutritional elements it contains. It includes important nutrition elements such as essential amino acids, fatty acids, vitamins (B2, B3, B6, B12), and minerals (selenium, iron, zinc, magnesium, phosphorus). An individual who consumes 100 g of red meat in his/her daily diet takes 25% of vitamin B3, 37% of vitamin B12, 18% of vitamin B6, 12% of iron, 32% of zinc, and 24% of selenium that s/he should take daily (6, 7, 8, 9, 10, 11, 12, 13). The ratio of protein and fat in red meat depends on the meat being fatty and non-fatty. Fatty meat has higher saturated fatty acid and cholesterol (14). Meat and meat products currently

represent an important source of protein in the human diet, and their quality varies according to intrinsic and extrinsic parameters that can sometimes be shaped to make a product more desirable. Because consumers are the final step in the production chain, it is useful to identify which factors affect their behavioral patterns. This would allow the meat sector to better satisfy consumer expectations, demands and needs (15).

In the study, it was aimed to determine the individuals' red meat consumption habits, their purchasing behaviors, and the factors affecting consumer decisions.

2. Materials and methods

The primary data of the research material were the data from the year July 2021 obtained from consumers in Tokat provincial center. The data were obtained through face to face interviews with the consumers using a questionnaire form arranged for the purpose of the study. The total number of questionnaires to be conducted was determined by the data obtained from the records of the Tokat Province Directorate of Census. The number of questionnaires were determined using the proportional sampling method (16). Using this method, interviews were conducted with 410 consumers at the 95% confidence interval and 5% margin of error. This study was conducted according to the guide-lines laid down in the Declaration of Helsinki and all procedures involving human subjects were approved by the Ethics Committee at Tokat Gaziosmanpasa University (decision no: 2021/16-04).

Chi-Square independence test was performed in order to determine whether there was a difference between the groups in terms of the discrete variables obtained in the study. The proximity between the observed frequency values and the expected frequency values indicates independence. In addition, this test also demonstrates whether the relationship between the two variables is statistically significant (17, 18). In cases where the relationship between the variables measured with Chi-Square test was significant, Coefficient of Contingency dependence coefficient was used in order to test the interdependence between the variables in question or the significance degree between them. Dependence coefficient takes a value

between 0 and 1, and as this coefficient is closer to 1, the rate of the relationship becomes higher (19). A 5-point Likert type scale was used in order to measure the factors that individuals pay attention to regarding the place of purchase according to their income level groups. The Likert-type scale is used to obtain information about the extent to which consumers participate in statements related to research (20). Likert type scale is the ordinal-interval hybrid scale type. Such scales are actually ordinal scales. However, it is assumed that researchers have an artificially spaced-out scale for advanced statistical analysis. Basic mathematical operations such as average can be applied by means of Likert type scale (21).

In addition, body mass indexes (BMIs) of the individuals were calculated by using the formula below:

$$\text{BMI (kg/m}^2\text{)} = \text{Body Weight (kg)} / (\text{Height (m)})^2$$

Individuals with BMI <18.5 kg/m² are defined as lean, between 18.5-24.9 kg/m² as normal, between 25-29.9 kg/m² as overweight, and ≥ 30 kg/m² as obese.

3. Findings and discussion

3.1. Socio-Demographic characteristics of the individuals

Nutritional needs of individuals vary according to physical and social factors such as age, gender, education, and profession.

As shown in Table 1, 43.90% of the individuals were female, and 56.10% were male. 81.46% of the participants were married. The majority of the individuals were within the age range of 36-50 years. Most of the participants had elementary school and high school education level. The average number of family members in the household was found to be 3.43. When considered in terms of professions, 26.10% of the participants were state officials, 20.49% self-employed, 19.51% workers, 16.59% retired, 10.24% housewives, and 7.07% farmers. The average monthly income of the participants were 4,158.21 TL, and their average monthly food expenditure was 978.57 TL. The mean BMI value was determined to be 24.43±4.05

for female participants and 26.78±4.19 for male participants.

3.2. The individuals red meat consumption habits and purchasing behaviors

As shown in Table 2, it was seen in the study that the ratio of red meat consumers was 85.85%, while it was 14.15% for non-consumers. When the studies conducted on different regions are examined, it is seen that the majority of the people consumed red meat. It was determined in various studies that 95.96% of the individuals in Antalya consumed red meat (22), and this rate was found to be 99.8% in Siirt (23), and 87.1% in Odemis district of Izmir province (24). 45.45% of the individuals bought red meat at the butcher. While 35.23% of the individuals bought red meat at a market – supermarket, and 14.49% bought it at the butcher + market – supermarket, 4.83% preferred to buy live animals and slaughter them themselves. In a study conducted in Sirnak, in response to the question where they bought red meat, 48.3% said they bought at the butcher, 13.3% at the market, 22.4% said they slaughtered the animal themselves, and 16.0% said they did not have any preferences in this regard (25). In the study, it was found that 50.85% of the individuals preferred to consume veal, 16.48% beef, 8.52% mutton, and 5.97% lamb. Besides, while 13.07% of the individuals preferred beef and veal together, 5.11% preferred to consume lamb and mutton together. In different studies conducted in different regions, similar results were found. In the study conducted by Boz, it was determined that the participants mostly preferred beef and veal by 78.2%. Veal was found to be the most preferred type of red meat among all income groups (26). Saygin determined the consumption of veal to be 73.00% (27), Ilhan found it to be 88.11% (28), Akcay and Vatansever (29) found it as 89.55%, and Aglarci determined this rate to be 78.2% for beef – veal consumption (30). However, in the study conducted by Karakaya and Kiziloglu, it was reported that the individuals preferred veal by 22% as their third choice (31).

In the study, it was determined that the participants bought and consumed red meat as mincemeat by 39.20%, as boneless meat by 33.24%, as boneless meat + mincemeat by 24.15%, and as giblets by 3.41%.

Table 1. Socio-Economic Characteristics of the Individuals and their BMI Values.

Characteristics		Income Group 1	Income Group II	Income Group III	General	(%)
Gender	Female	63	59	58	180	43.90
	Male	79	90	61	230	56.10
	Total	142	149	119	410	100.00
Age range	25-35	41	40	24	105	25.61
	36-50	54	61	53	168	40.98
	51+	47	48	42	137	33.41
	Total	142	149	119	410	100.00
Educational status	Literate	6	4	2	12	2.92
	Elementary Sch.	67	43	28	138	33.66
	High School	56	74	48	178	42.93
	University	13	28	41	82	20.49
	Total	142	149	119	410	100.00
Marital status	Married	121	117	96	334	81.46
	Single	21	32	23	76	18.54
	Total	142	149	119	410	100.00
Profession	Worker	23	37	20	80	19.51
	State Official	32	44	31	107	26.10
	Farmer	18	6	5	29	7.07
	Self-employed	24	26	34	84	20.49
	Retired	25	23	20	68	16.59
	Housewife	20	13	9	42	10.24
	Total	142	149	119	410	100
BMI(kg/m ²)	Female	24.49±4.78	23.52±3.76	24.92±3.62	24.43±4.05	-
	Male	26.57±3.81	25.86±4.29	27.15±4.32	26.78±4.19	-
	Mean.±SD	25.52±4.28	24.71±4.06	26.03±3.97	25.57±4.12	-
Average number of family members (persons)		3.06	3.36	3.94	3.43	-
Average income (TL/Month) ¹		2378.53	4025.62	5771.58	4158.21	-
Average food expenditure (TL/Month) ²		737.18	1006.25	1154.21	978.57	-
The rate of food expenditure in income:(2/1*100)		30.99	24.99	19.99	23.53	-

The main type of red meat consumption continues to be in the form of mincemeat and boneless meat in Turkey. The results obtained in various studies conducted confirm this situation. In the study they conducted, Karakaya and Kiziloglu reported that 30.8% of the individuals preferred to buy red meat as boneless meat/mincemeat, 25.1% as boneless meat, 22.2% as mincemeat, 12.5% as sausage/salami/ wiener, and 9.4% as giblets (31). In the study conducted by Aglarci, it was

revealed that 44.8% of the individuals chose to buy red meat as mincemeat, 7.1% as steak fillet, 9.4% as ribs, 5.6% as beefsteak, 28.2% as meat cubes, and 4.9% as bone-in meat (30). In their study, Yaylak et al. determined that 38.5% of the individuals bought red meat as boneless meat, 50.6% as mincemeat, 10.9% as bone-in meat, and as other types (24). In the study he conducted, Ilhan reported that 51.89% of the participating individuals consumed red meat as mincemeat,

Table 2. Findings Regarding Red Meat Consumption.

Consumption habit	n	%
Consumers	352	85.85
Non-consumers	58	14.15
Total	410	100.00
Places of purchasing	n	%
Butcher's	160	45.45
Market-Supermarket	124	35.23
Butcher's + Market -Supermarket	51	14.49
Slaughtering for self-consumption	17	4.83
Total	352	100.00
Meat types	n	%
Mutton	30	8.52
Lamb	21	5.97
Beef	58	16.48
Veal	179	50.85
Beef + Veal	46	13.07
Lamb + Mutton	18	5.11
Total	352	100.00
Types of purchasing	n	%
Boneless meat	117	33.24
Mincemeat	138	39.20
Boneless meat + Mincemeat	85	24.15
Giblets	12	3.41
Total	352	100.00
Type of consuming	n	%
In vegetable dishes	83	23.58
Meat dish as grill - barbecue	51	14.49
In both types	218	61.93
Total	352	100.00
Frequency of purchasing	n	%
Weekly	121	34.38
Every 15 days	158	44.89
Once a month	73	20.73
Total	352	100.00
Consumption of processed red meat products	n	%
Salami	42	11.93
Sausage	247	70.17
Wiener	23	6.53
Other (pastrami, ready-made fried meat, etc.)	14	3.98
Non-consumers	26	7.39
Total	352	100.00
Evaluations about red meat price	n	%
Cheap	5	1.42
Normal	29	8.24
Expensive	215	61.08
Extremely expensive	103	29.26
Total	352	100.00

26.12% as boneless meat, and 22.09% as meat cubes (28). In another study conducted by Atay et al. it was determined that 46.9% of the individuals preferred red meat as mincemeat, 36% as mincemeat as a portion, 12.5% as bone-in meat, and 4.6% as carcass meat. The individuals preferred to buy red meat as mincemeat and meat cubes as they could use them in more than one and different dishes. 61.93% of the individuals preferred red meat in vegetable dishes as well as grilled – barbecued meat (32). As a result of literature review, it was determined that similar results were obtained in studies conducted in different regions. In the study conducted by Boz it was found that 61.5% of the individuals stated that they consumed red meat generally in dishes, 14.3% by cooking it in the oven, 14.3% by grilling it, 5.6% by frying it in oil, and 3.1% by boiling it (26). In the study conducted by Yaylak et al. it was reported that 19.3% of the individuals consumed red meat by grilling it, 16.8% by boiling it, 15.4% by using it in vegetable dishes, 8.6% by cooking it in the oven, 8.2% by frying it in oil, and 31.8% had no preferences in this regard (24). In the study he conducted, Aglarci determined that 12.8% of the participants consumed red meat by boiling it, 11.6% by cooking it in the oven, 21.6% by grilling it, 13.5% by frying it in oil, 36.8% by using it in dishes, and 3.7% in rice (30). In the study conducted by Karakus et al. it was found that individuals who consumed red meat preferred it as grilled by 38.4%, as boiled by 8.5%, in the oven by 6.2%, with vegetables by 6.2%, and as fried in oil by 4.3%. 25.0% did not state any preference in this regard (33). In a study conducted in Elazığ, Seker et al. determined red meat consumption preference as “grilled – fried” meat by 40.8%, “with vegetables” by 40.8%, “boiled” by 8.6%, and “other” by 9.7% (34). In the present study, it was determined that 44.89% of the individuals consuming red meat bought meat every 15 days. In the study they conducted, Karakaya and Kiziloglu determined that 62.2% of the individuals bought meat once a month, 19.4% bought it on special days, 9.6% bought it every 15 days, and 8.8% bought it weekly (31). In the study conducted by Aglarci it was determined that 2% of the individuals consuming red meat bought red meat every day, 34.3% once a week, 23.5% every 15 days, 24.5% once a month, and 9.8% on special days (30). In the study they conducted

in Erzincan province, Ozyurek et al. reported that 5% of the individuals consumed red meat every day, 36.7% once a week, 36.2% two-three times a week, and 11.6% once a month (35). Similar to the developments observed in Europe, processed meat products have been industrialized in Turkey, and products such as meatballs and hamburger are sold in different forms and with different packaging. In the present study, it was found that the individuals consumed sausages the most among processed red meat products by 70.17%. As red meat prices occupy a significant place in the individuals’ food expenditure items, high red meat prices affect the consumers regarding their purchasing behaviors. In the present study as well, 61.08% of the individuals stated that they found the price of red meat to be very high. In the study conducted by Saygin the individuals reported that red meat was expensive by 49%, and very expensive by 47.6% (27). In yet another study conducted by Aglarci it was determined that the individuals found red meat prices expensive by 51.3%, very expensive by 21.7%, and normal by 25.3% (30). In the study carried out by Saner and Kaya it was stated that one of the reasons for malnutrition experienced in Turkey was related with the deficiency in animal proteins, and that the high prices of red meat had a negative effect on the individuals’ red meat consumption (36). In another study conducted by Resurreccion it was reported that increasing health-related concerns and changes in red meat prices were among the leading factors affecting the demand for meat (37). Growth rates vary across different regions, with consumption in high-income countries static or declining and in middle-income countries moderately to strongly increasing, whereas in low-income countries, meat consumption is on average low and stable (12).

The individuals’ income is considered a factor that affects their red meat consumption. As their income level increases, so does their red meat consumption. In the present study, As shown in Table 3, it was determined that the individuals consumed an average of 3.46 ± 1.86 kg red meat. In the study they conducted, Lorcu and Polat reported that the average amount of red meat consumed by households consuming red meat was between 2.07 and 2.47 kg, and that as the income of the household increased, their red meat consumption increased as well (5). In the study conducted by

Akçay and Vatanser it was determined that the individuals' red meat consumption was 10.46 kg/year per capita, that red meat consumption increased in parallel with income group, and that red meat consumption was 6 kg/year in the low income group, 13.08 kg/year in the middle income group, and 10.80 kg/year in the high income group (29). In his study, İlhan found red meat consumption per capita to be 18.2 kg (28), and Gaytancıoğlu found this amount as 15.6 kg in another study (38). In the study they conducted, Seker et al. determined that 44.3% of the families consuming red meat consumed "less than 4 kg red meat a month" (34). In their study, Cosgrove et al. reported that the average daily amounts of red meat consumption per capita were 26 g, 33 g, and 51 g for processed meat, white meat, and red meat, respectively, and that males consumed all types of meat more than females (39).

The reasons for preferring to consume or not to consume red meat in Table 4. Red meat being an important source for human health, its high protein

value, and being delicious are important factors in red meat consumption. Consumption habits of people form slowly and in a long period of time. In addition, red meat, which is delicious, is consumed in many ways, and has a high degree of digestion, is more expensive compared to other foods in almost every part of the world. It can be stated that this situation is an important factor that decreases the consumption of red meat in adequate amounts. Meat consumers around the world are increasingly paying attention to product quality and safety, and are starting to reduce their meat consumption, especially with regard to red meat. This trend is prevalent in households with children who prefer health-certified meat products (40).

In the present study, it was found that the leading factor in red meat consumption was that it was part of the individuals' nutrition and consumption habits with a rate of 84.66%. It was followed by the factor of its being necessary for balanced and healthy nutrition for individuals by 68.75%. Meat is an important

Table 3. Red meat consumption amounts (kg/month).

	Income Groups			
	Group I (kg/month)	Group II (kg/month)	Group III (kg/month)	General (kg/month)
Consumption Amount (Mean ± SD)	2.42±1.18	3.78±2.45	4.21±1.92	3.46±1.86

Table 4. Reasons for preferring to consume or not to consume red meat.

Reasons for preferring to consume	n	%*
It is delicious	163	46.31
It is necessary for balanced and healthy nutrition	242	68.75
I have a habit of nutrition and consumption	298	84.66
It has a high nutritional value	193	54.83
It is easily available	24	6.82
Reasons for preferring not to consume	n	%*
I am a vegetarian	8	13.79
I do not find it delicious	19	32.76
It contains high cholesterol	51	87.93
It contains hormones and residues	49	84.48
I have doubts about its safety	38	65.52
I find its price high	47	81.03
I do not believe hygiene rules are observed during slaughtering	42	72.41

*The total percentage exceeds 100% as more than one responses were given.

source of animal protein, and it is a complete food that contains many components that are needed in fulfilling growth, development, and physiological functions. Proteins, fats, water, carbohydrates, vitamins and mineral salts which human body needs are included in red meat. Thus, red meat having a high nutrition value made it the third important factor that directed people to consume red meat by 54.83%. It was followed by the factor of red meat being delicious by 46.31%, and its availability at any time and place by 6.82%. In the study conducted by Boz it was reported that the primary reason for individuals preferring red meat was its high nutrition value by 35.4%, its being healthy by 22.9%, its being delicious by 25.4%, its being a habit by 14.9%, and other reasons by 1.2% (26). In the study they conducted, Yaylak et al. determined that the reasons for individuals preferring red meat were its being delicious by 52%, its being nutritious by 20.9%, its being a habit by 17.2%, its being easily available by 2.7%, and all the reasons above by 7.2% (24). In the study conducted by Richardson et al. it was stated that 28.3% of the individuals reduced red meat consumption, and that the most important reason for this reduction was their health related concerns (41). Hielkema and Lund, strategies should focus on meat reduction, not exclusion, as completely removing meat from the diet was unpopular in Denmark (42). In the study they carried out, Eichholzer and Bisig reported that the individuals living in certain regions of Switzerland, who had low education level, were obese, and consumed giblets, consumed more meat and meat products. It was also stated in the study that individuals whose income levels were below a certain level consumed more meat than recommended amount (43).

In the present study, the most important factor for the individuals not preferring red meat consumption

was that it consisted of high cholesterol by 87.93%. This was followed by the belief that it contained hormones and residues by 84.48%, finding red meat prices high by 81.03%, having doubts about the safety of meat provision by 65.52%, not finding red meat delicious by 32.76%, and being vegetarian by 13.79%. In his study he conducted in Turkey, Demirtas determined that price increases had a greater impact on red meat consumption (44). In the study conducted by Boz it was reported that being on a diet by 33.3%, finding red meat expensive by 16.6%, being vegetarian by 16.6%, not having a habit of eating/dining by 16.6%, and thinking that meat is imported by 16.6% were among the reasons for the individuals not consuming red meat (26). In the study they conducted, Karakaya and Kiziloglu revealed that those who did not consume red meat stated that they stayed away from it due to economic reasons by 33.3%, being on a diet by 23.8%, being vegetarian by 19%, other reasons by 14.3%, and health concerns by 9.5% (31). In the study conducted by Ulas the reasons for the individuals who did not consume red meat were stated as economic reasons by 33.3%, health reasons by 33.3%, being vegetarian by 16.67%, and being on a diet by 16.67% (45). Harguess, twenty-two articles were identified. These studies targeted factors such as knowledge and skills with informational provisions about health and the environment; values and attitudes concerning the relationship between social dominance and meat; evocation of emotion such as empathy and disgust; social norms both dynamic and growing; changes to the food environment with default vegan menu options, perceived behavioral control, and intentions. In general, increasing knowledge alone or when combined with other methods was shown to successfully

Table 5. Factors that the individuals paid attention to the place of purchasing according to income groups.

Factors	Likert Scale Averages*			
	Group I	Group II	Group III	General
The possibility of carrying animal diseases	2.81	3.73	3.69	3.44
Meat not being healthy and hygienic	4.31	4.45	4.63	4.49
Meat not being controlled by authorities	4.54	4.67	4.59	4.61
Meat not being delicious	.26	3.58	3.82	3.56

*1.Strongly Disagree 2.Disagree 3.Undecided 4.Agree 5. Strongly Agree

reduce meat consumption behavior or intentions/willingness to eat meat (46).

As shown in Table 5 when the factors to which the individuals paid attention to regarding the place of purchase are considered, it is understood that they attached the most importance to the fact that meat was not controlled by the authorities. This factor was followed by meat not being healthy and hygienic, its not being delicious, and the possibility of meat carrying animal diseases. It is seen that similar results were obtained in studies conducted. Saygin emphasized that the factors of the reliability of the place of purchase by 79.7% and being a quality place of purchase by 56.6% were very effective in determining the individuals' preference of place of purchase (27). Seker et al. determined in another study they conducted that the rate of the individuals who found the meat they purchased reliable was 78.8% (34). Aygun et al. reported that 52.2% of the individuals believed the meat they purchased was reliable (47).

3.3. Analysis of the factors affecting red meat consumption

The nutrition transition encompasses a set of major shifts in human diet and nutritional status, throughout history and that is influenced by a wide range of factors such as income, technical change, urbanisation and culture (48).

It is known that as the individuals' income levels increase, their food expenditures also change. Per person consumption was influenced most strongly by changing consumer preferences and income growth (49). Gosard et al. (50) analyzed the social structure factors regarding the individuals' meat consumption. In that study, it was reported that in addition to gender, race, ethnic structure, place of residence, and social class, some other physiological and psychological variables were important in terms of the leading factors affecting food consumption structure. From the data they obtained from 137 countries, Milford et al. determined that income per capita and the rate of urbanization were the two most important driving forces in the total meat consumption per capita (51). Bereznicka and Pawlonka revealed that meat consumption in Poland was mostly determined by income level, and that low income was the reason for the exclusion of red

meat in diets. Some effective factors regarding the individuals consuming or not consuming red meat were analyzed. According to the analysis results (Table 6), it was determined that there was a statistically significant relationship between the individuals' income levels and red meat consumption ($\chi^2=20.03$; $P\leq 0.01$) (52). When the studies conducted in the literature were examined, it was seen that there was a statistically significant relationship between red meat consumption and income level (53, 32, 54, 23). Ozyurek et al. found the effect of monthly income on the frequency of the individuals' consuming red meat to be statistically significant (35).

In the present study, a statistically significant relationship was found between red meat consumption and the individuals' food expenditures ($\chi^2=9.27$; $P\leq 0.05$). Studies conducted also show the important share of food expenditures in red meat consumption (53, 45, 23, 35). On the other hand, Karakas did not determine a relationship between total food expenditures and red meat consumption (54). In the present study, a statistically significant relationship was determined between red meat consumption and the profession of the individuals ($\chi^2=8.82$; $P\leq 0.05$). In some studies conducted, a relationship between red meat consumption and the profession of individuals was also found (53). Other than these factors, no statistically significant relationship was found between red meat consumption and the examined factors of age, gender, marital status, education and BMI. In some studies, education was determined to be significant, but no significant relationship was determined between red meat consumption and other factors (53, 54). In their study, Wang et al. determined that high amounts of red meat and processed food consumption increased the probability of being obese. One study examined association between red meat consumption and changes in body mass index (BMI), body weight and overweight risk in Chinese adults. In general, participants with higher red meat intake appeared to be those with younger age, higher personal income and higher education level, lower physical activities, higher total energy intake, smokers and alcohol drinkers (55). Red meat intake was positively associated with changes in BMI and body weight (56). More clinical studies are needed to determine the relationship between BMI and red meat consumption.

Table 6. Analysis of the factors affecting red meat consumption

Factors		Red Meat				χ^2	Difference Level(P)	DF	CC
		Consumers		Non-Consumers					
		n	%	n	%				
Income level (TL)	<3000	107	75.35	35	24.65	20.03	Significant*	2	0.217
	3001-5000	135	90.60	14	9.40				
	≥5001	110	92.44	9	7.56				
	Total	352	85.85	58	14.15				
Food Expenditures (TL)	<1000	141	80.11	35	19.89	9.27	Significant**	2	0.149
	1001-2000	137	88.96	17	11.04				
	≥2001	74	92.50	6	7.50				
	Total	352	85.85	58	14.15				
Age	25-35	91	86,67	14	13.33	1.16	Insignificant	2	-
	36-50	142	84.52	26	15.48				
	51+	119	86.86	18	13.14				
	Total	352	85.85	58	14.15				
Gender	Female	154	85.56	26	14.44	0.04	Insignificant	1	-
	Male	198	86.09	32	13.91				
	Total	352	85.85	58	14.15				
Marital status	Married	288	86.23	46	13.77	0.17	Insignificant	1	-
	Single	64	84.21	12	15.79				
	Total	352	85.85	58	14.15				
Education	Literate	10	83.33	2	16.67	0.18	Insignificant	3	-
	Elementary Sch.	119	86.23	19	13.77				
	High School	153	85.96	25	14.04				
	University	70	85.37	12	14.63				
	Total	352	85.85	58	14.15				
Profession	Worker	62	77.50	18	22.50	8.82	Significant**	5	0.145
	State Official	97	90.65	10	9.35				
	Farmer	27	93.10	2	6.90				
	Self-employed	73	86.90	11	13.10				
	Retired	58	85.29	10	14.71				
	Housewife	35	83.33	7	16.67				
	Total	352	85.85	58	14.15				
BMI(kg/m ²) (Female)	<18,5	0	0	0	0	0.46	Insignificant	3	-
	18,5-24,9	71	46,10	14	53,85				
	25-29,9	83	53,90	12	46,15				
	≥30	0	0	0	0				
	Total	154	100,00	26	100,00				
BMI(kg/m ²) (Male)	<18,5	0	0	0	0	0.45	Insignificant	3	-
	18,5-24,9	54	27,27	10	31,25				
	25-29,9	129	65,15	19	59,38				
	≥30	15	7,58	3	9,37				
	Total	198	100,00	32	100,00				

*Significant at P≤0.01 Level **Significant at P≤0.05 Level

4. Conclusion

The importance of balanced nutrition for the protection and improvement of human health is increasing every passing day. With adequate and balanced nutrition, it is aimed to provide the energy for the body and to take nutritional elements into the body in daily required amounts. Today, adequate and balanced nutrition of all people over the world is among the leading topics. Adequate and balanced nutrition ensure to maintain a healthy life and mental activities, and thus it contributes to the socio-economic development of the society. In this respect, red meat consumption as a source of protein comes to the fore in Turkey. In addition to the efforts to increase the production of meat and meat products as animal protein source, it is equally important to identify red meat consumption habits. As the population of Turkey is increasing fast, it is mandatory to increase and evaluate the level of sources used in nutrition. Among the reasons for low consumption amount of animal protein per capita, the price of animal food being higher compared to vegetable foods, low income level, and nutrition habits can be listed. It is seen that individuals' income levels and nutrition habits are among the factors affecting red meat consumption amounts. In addition to the efforts shown in order to increase meat production so that individuals get adequate and balanced nutrition, planning and guiding the phenomenon of consumption is a subject that needs to be emphasized. Although changing of consumption habits is a challenging and time related process, the probability of success of programs based on data is higher in changing the habits in such a way to ensure balanced nutrition. Therefore, determining red meat consumption habits regionally and even locally is important in terms of identifying individuals' preferences in issues such as type of meat and processing and serving meat. Ensuring the consumption of red meat which is in high quality and contains high protein in daily diets by considering consumer preferences will also provide benefits for the health of individuals. In this context, red meat consumption should be encouraged in a balanced way in line with the consumption texture, and necessary measures should be

taken in order to enable red meat to be consumed as an important element of balanced nutrition.

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