

**ÇUKUROVA UNIVERSITY
INSTITUTE OF NATURAL AND APPLIED SCIENCES**

MSc THESIS

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**RED MEAT CONSUMPTION STRUCTURE AND CONSUMER
BEHAVIOR IN THE URBAN AREA OF ADANA PROVINCE**

DEPARTMENT OF AGRICULTURAL ECONOMICS

ADANA-2020

ABSTRACT

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This study was carried out in the urban area of Adana. The study aims to determine consumption structure and consumer behavior in different income groups toward red meat consumption habits and consumers' family's preferences. At a macro level, the first part of the study consists of analyzing the red meat sector in the world in general and in Turkey in particular. At a micro level, on the other hand, a face-to-face questionnaire study was carried out on 400 households in Adana. The most important factor in fluctuations of red meat consumption was its price, but this fact varied in different income groups. In addition to price considerations, a binary logit model was used to determine the purchasing place preferences of consumers. It was revealed that the convenience of shopping, amount of consumption, education level, and meat quality were important in determining the place of meat purchasing. It was concluded that red meat consumption could reach expected levels through the improvement of current policies towards supply and demand.

Key words: Red meat, Binary logit model, Consumer behaviour, Consumption structure

ÖZ

YÜKSEK LİSANS TEZİ

ADANA İLİ KENTSEL ALANDA KIRMIZI ET TÜKETİM YAPISI VE TÜKETİCİ DAVRANIŞLARI

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Bu çalışma, Adana'nın kentsel alanında gerçekleştirilmiş olup, çalışmada tüketicilerin gelir grupları itibarı ile kırmızı et tüketim alışkanlıklarına ve tercihlerine yönelik tüketim yapısının belirlenmesi amaçlanmıştır. Çalışmanın ilk bölümünde, makro düzeyde dünya genelinde ve Türkiye'de kırmızı et sektörünün genel yapısı ortaya konulmuştur. Mikro düzeyde ise Adana'da 400 tüketici ile yüz yüze anket çalışması yapılarak veriler elde edilmiştir. Çalışmadan elde edilen sonuçlara göre; kırmızı et tüketimindeki dalgalanmalarda en önemli etken fiyattır, ancak bu durum farklı gelir gruplarına göre de farklılık göstermektedir. Çalışmada, fiyat değerlendirmelerine ek olarak, tüketicilerin satın alma yeri tercihlerini belirlemek için binary logit modeli kullanılmıştır. Et satın alma yerini belirlemede alışveriş kolaylığı, tüketim miktarı, eğitim düzeyi ve et kalitesinin önemli olduğu belirlenmiştir. Buna ek olarak , arz ve talebe yönelik mevcut politikaların iyileştirilmesi ile kırmızı et tüketiminin beklenen seviyelere ulaşabileceği sonucuna varılmıştır.

Anahtar kelimeler: Kırmızı et, Binary logit model, Tüketici davranışları, Tüketim yapısı

EXTENDED ABSTRACT

The level of nutrition has become a factor in the development of countries as a result of global economic development. Foods of animal origin play a significant role in adequate and balanced nutrition due to the protein content. In this respect, at least 50% of the protein required for balanced nutrition of the human body and 25% of the required calorie amount must be provided from foods of animal origin. Only 29% of the protein needs per capita in Turkey are obtained from foods of animal origin. Increasing the production and sustainability of meat and meat products is of great importance for the balanced and adequate nutrition of the country's population.

In Turkey for agricultural production, animal production activities are often held as a side formed from crop production. The most important indicator is the share of agriculture in business enterprises engaged in livestock production in Turkey. Family-type enterprises, which make up a large portion of the animal-producing enterprises, are structural, enterprises that contain a few animals and produce mainly for self-consumption, and a small portion for economic gain.

As for the geographical location of Turkey, it has great potential in breeding although this potential is not used properly. Although efforts are being made to protect grasslands and pastures, which are essential livestock needs, they are decreasing (Saygın and Demirbaş, 2017). The livestock sector has declined as a result of flawed policies, resulting in lower livestock production and higher commodity prices (Vural and Fidan, 2007).

The average number of animals in the livestock business in animal production in leading countries in the world is over 200 heads, while the average number of animals per farm in Turkey is 15 heads. According to TURKSTAT data, 83.7% of the large ruminant breeding are under 20 head. These enterprises are family-owned businesses that produce in traditional ways and operate in other business lines (Çevik, 2018).

Red meat production in Turkey in early 1990, had a share of 33% of small ruminant meat. In the last years, this share has decreased and in 2018 it reached 10%. The reasons for this can be listed as the increase in large ruminant breeding, intense migration of the people from rural to urban areas, and small ruminant breeding is more troublesome than large ruminant breeding. That is why large ruminant meat production constitutes 90% of the red meat production in 2018. In Turkey, because of people's religious beliefs, red meat sources are beef, buffaloes, goats, and sheep no pork meat.

In this study, considering the current red meat sector in Turkey, consumption structure, and consumer behavior in different income groups toward red meat consumption habits and consumers family's preferences were determined in Adana. We did the study at a macro level by analyzing reports prepared by institutions like FAO, TurkStat, and secondary data obtained from the scanned literature. The corresponding tables and graphs were made. Then commenting on those pieces of information about red meat production, consumption, and trade in the world were made first. And secondly, red meat production, consumption, and trade in Turkey were made. And we closed that part with policies towards the years in Turkey to improve red meat production.

At a micro level of this study, the number of surveys carried out was divided into three groups in the determination of income groups. The income levels of households were divided as 0-2500 TL (low-income group, 118), 2501 - 4000 TL (middle-income group, 167), and 4001 TL and above (high-income group, 115). A descriptive analyze was made about consumers and their households, then reasons of changes in red meat consumption in households compared to previous years, consumers' red meat shopping place preferences, consideration of some important factors in red meat consumption, concerns of consumers for red meat consumption, the effect of possible changes in red meat prices on purchase quantity and consumers attitude toward meat reliability were determined. The binary

logistic model was used to determine the factors affecting the purchase of household red meat in downtown Adana.

Turkey has structural problems such as the costs in the livestock sector, low productivity, hygiene and quality, market, and marketing issues. Along with the solution to the problems related to the sector, it is thought that it will also be successful in future contracts to be carried out on animal husbandry.

Although it seems like a short-term solution to reduce import freedom and customs duties to prevent high meat prices in the market, it manifests itself as an application that harms the livestock industry. The only condition for supporting animal husbandry is rural development. In this context; Making arrangements to eliminate income inequality between rural and urban areas, Public investments to meet the needs of rural people, Preventing migration from rural to urban areas, Increasing the training and extension studies for animal husbandry, Increasing the support for fattening cattle, Purchase guarantee for living animals and red meat produced, in other words, a market must be found for producers.

We hope that the results of this research will help decision-makers on the subject by taking appropriate decisions to help the red meat sector in general and the red meat sector in Adana in particular.



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ABBREVIATIONS

EBK	: Et ve Balık Kurumu
EU	: European Union
FAO	: Food and Agriculture Organisation
IMF	: International Monetary Fund
OECD	: Organisation for Economic Co-operation and Development
SEK	: Süt ve Süt Ürünlerinin Üretiminin
TURKSTAT	: Turkish Statistical Institute
UK	: United Kingdom
UN Comtrade	: United Nations International Trade Statistics Database
US	: United State
VAT	: Value Added Tax
WHO	: World Health Organization
YEMSAN	: Manisa Yem Fabrikası



1. INTRODUCTION

From general observation, the development of a country is based on several factors and one of the most important is the well-being of individuals living on the territory. For the well-being of individuals, it is necessary to have good nutrition. An adequate and balanced diet is an essential requirement for the vital activities of individuals and, by extension, are basic conditions for the development of the whole society.

To ensure an adequate and balanced diet, we need to consume animal foods. Animal protein foods, such as meat, milk, and eggs are important in human nutrition. One of the most important requirements for a healthy and balanced diet should be around 40-50% animal originated of daily consumed protein (Anonymous, 2015a; Gogus, 1986).

It is even possible to say that nowadays, the level of animal product consumption is an indicator of the countries development. Meat consumption is highest across high-income countries (with the largest meat-eaters in Australia, consuming around 116 kilograms per person in 2018). The average European and North American consumes nearly 80 kilograms and more than 110 kilograms, respectively (Anonymous, 2018). Many factors such as wealth, the volume of livestock production, and socioeconomic status of consumers could explain the higher consumption pattern of meat by Western populations.

In developing countries such as Turkey, the structure and amount of consumption of animal products have been increased as parallel with social and economic developments. Parallel to the global and regional developments in periods, significant changes have occurred in economic policies adopted and implemented in Turkey over the years (Harun et al, 2007).

The food consumption structure differs from country to country. Turkey is a country with a traditional agriculture type of food consumption. But the

mentioned factors are changing in the direction of western consumption model (Akdemir, 1989).

Meat consumption is related to living standards, diet, livestock production, and consumer prices, as well as macroeconomic uncertainty and shocks to GDP. Compared to other commodities, meat is characterized by high production costs and high output prices. Meat demand is associated with higher incomes and a shift, due to urbanization, to food consumption changes that favor increased proteins from animal sources in diets (OECD, 2017).

Animal breeding and husbandry is an important industry and mainstay in Turkey. Today, approximately 14.2 million cattle, 30.9 million sheep, and 10.3 million goats are bred in Turkey. Total red meat production in Turkey was 1.1 million tons, equal to 14.70 kg per capita in 2016 (TSI, 2017).

The low price for red meat is an important factor in consumers' choice (Gül and Şahin, 1998). The increase in red meat prices in recent years has had a negative effect on consumer red meat demand, even though red meat is an important food for Turkish society. Red meat consumption has been affected by many other factors too, such as the annual population growth rate, the changes in population structure, consumer choices, product quality, consumer education, religious beliefs, health issues, climate, traditions, and purchasing power (İçöz Y., 2004; Hanta, B., 1984). Also, due to negative experiences in the past (BSE, avian influenza, etc.), consumers are very sensitive about food safety not only in Turkey but also all over the world. For those reasons, revealing consumers' perceptions towards meat and meat products is an important research area for the determination of consumer behavior and policy formation.

To evaluate the purchasing attitude of consumers it is being inevitable in the developing technology and competition condition to make researches. Therefore, the role of those researches has risen to eminence nowadays. The

findings of researches provide new and important knowledge to the countries, firms, producers, and consumers.

This study emphasizes the importance of red meat consumption research. The results of this study were compared with studies in the literature.

Along with efforts to increase meat production for balanced and proper nutrition of the human well being, factors affecting meat consumption by the consumers are important. Conducted in the central district of Adana, this study examines the factors that affect the consumption of red meat by determining household tendency of red meat consumption. Thus, red meat consumption preferences of the consumers and factors affecting the consumer preference and importance of the red meat in the diet profile of the households will be determined.

1. The first part will be a general observation of the evolution of red meat consumption in the world in general and in Turkey in particular and also the policies in Turkey to improve the red meat sector
2. This study in the second part will evaluate the willingness for future meat consumption using a 2019 survey, and elucidate the factor influencing consumer attitudes toward red meat consumption.



2. LITTERATURE REVIEW

There have been many researches that examined the factors affecting the consumption of meat and meat products on consumers in the world in general and in Turkey particularly.

Hanta (1984), in his master thesis titled “Animal Food Consumption Structure in Urban Area of Adana Province”; study the effects of red meat, milk and dairy products, chicken meat and egg consumption, and income on animal food consumption. The average annual income of the families was calculated as 72.990.000 TL. These families allocate 8.161.247 TL which constitutes 11.2% of their annual average income, for expenditure on animal foodstuffs 39.4% of animal food consumption expenditures are meat, 18.1% are dairy products, 15.1% are milk, 15.1% is chicken meat and 12.3% are egg consumption expenditures.

Akdemir (1989), in his study of the structure of food consumption in Turkey and the world, revealed that the structure of food consumption varies from one country to another. Turkey is a country whose structure of food consumption of the agricultural product is mostly traditional. During the period 1983-1985, the quantity consumed per capita in the world is 68.2 grams of animal protein per day, it was determined that during the same period this amount was 84.3 grams in Turkey.

Gökçek (1998), in the urban area of Adana for the estimation of oil consumption and the elasticity of oil expenditure, 213 families were selected. In examining the relationship between consumption and income the income elasticity edible oil consumption was calculated. He used the linear function in the calculation of income-consumption elasticity. The income-expenditure elasticities of oil and margarine were less than 1 and olive oil and butter greater than 1. The income-expenditure elasticity was calculated at 0.90 for all oils examined.

Koç et al. (1997), in their study, product consumption and meat expenditures were investigated and expenditure elasticities were estimated. Data

were collected by a face-to-face survey with 400 households. According to the result, the household width is 3.8 people and consumption per capita per year was calculated as 26.5 kg. Spending elasticities are 0.70 for total food, 0.95 for total meat, 0.90 for total fresh meat, 1.10 for red meat, 0.60 for chicken meat.

Keskin et al. (2000), in their study aimed at examining the structural changes in animal production between agricultural regions and the factors affecting those changes. Secondary data were used in the study and 32 - year time series of 1967 - 1998 period was used. Econometric models were used to analyze the time series of population, yield, production, and animal numbers. As a result of the analysis, the factors influencing the production of large ruminants according to their importance; population, yield, and the number of animals. According to the results of econometric modeling to reveal the differences between regions; yield in large ruminant production was the most important factor in the Northern and the Black Sea regions. As a result, it emphasized that yield has an important place in red meat production and therefore policies that increase productivity should be implemented.

Verbeke et al. (2000), in their study in Belgium, the factors affecting consumers' decision-making for fresh meat consumption were investigated. Starting from the mad cow disease (BSE) crisis, they modeled probit to explain the decrease in consumer choice in future fresh meat consumption. They used demographic characteristics, frequency of consumption, and TV reception as explanatory variables. As a result of the analysis, it was found that the decrease in fresh meat consumption had a positive relationship with the consideration of TV broadcasts, the presence of young people at home, and the increasing age of the people. As a result of the study, it was found that young individuals were more affected by fresh meat consumption than the media news. They predicted that the consumption of fresh meat for the future will decrease.

Sanchez et al. (2001), in their research, consumers buying behaviors, purchasing experiences, and health effects of mutton and beef. Also, they

examined in each market segment the different qualities of foods according to the estimates of consumers' willingness to purchase. In this study, the data was collected in Spain by surveys conducted with consumers in two cities. As a result, they find out that consumers who are sensitive or not to health risk have similar choices, besides beef consumers give more value quality label and products regional origin are more valuable by mutton consumers.

Dölekoglu (2002), in his Ph.D. thesis, study the monthly consumption of households to determine the adequate and balanced nutrition levels. For this purpose, the survey was conducted with 300 households in the city center of Adana and the calorie consumption was 3059 cal/day by households. For factors affecting calorie intake, he used the logit model. He found out food saturation has a negative effect on calorie intake and food expenditure, mother's education, the male population in the household has a positive effect. Product feature set evaluations were made by conjoint analysis. Price and brand have effective features in the decision of the purchase.

Saner and Kaya (2002), in their study, found out that in developing countries like Turkey the nutrition is mostly plant-based products but in developed countries, it is more based on animal products. 60% of nutrition should be plant-based and 40% animal products. So, the animal protein deficit in Turkey is resulting in malnutrition. Especially because of the high price of red meat, consumer decreases their consumption or some of them stop consuming. The basis of these problems in the livestock sector marketing have not yet permanent solutions. In this study, the red meat market and the way of functioning were determined, the aim was to provide solutions that can guide the improvements in this subject. As a result, the yield of the carcass is low in Turkey, meat and meat products marketing chain is complex and there is no organization, nearly half of the segments are illegal, and finally, an excessive VAT is applied to meat products in retail sales.

Upton (2004), in his study, it is aimed to examine the problems encountered in the development of animal husbandry in the context of reducing poverty. He pointed out that animal husbandry is vital for the economies of many developing countries and that the consumption of animal foods is rapidly increasing in developing countries. Stating that poor people with low incomes worldwide live in rural areas and depend on agriculture, he emphasized that agricultural development plays an important role in poverty reduction. He analyzed livestock and animal product trade and stressed that despite the expanding market for animal products in recent years, developing countries have become net importers from net exporters. In particular, the US, the EU, and Japan implemented domestic producer protection policies around the world and the price stability of emerging countries for producers of cheap price competition has shown that developing countries' trade liberalization will be low.

Akbay and Boz (2005), examines the strategies of livestock production and consumption of animal products in Turkey. Their study had aimed to identify opportunities for improvement. Secondary data were used in the study. As a result of a significant reduction in the presence of large ruminant and small ruminant animals, they stated that per capita red meat consumption and milk consumption decreased, red meat consumption shifted to fish and poultry meat consumption over time, and the basis of this was the change in income and red meat prices. Turkey's government and policymakers in terms of long-term sustainability in agriculture stressed the need to support the making of vegetable and animal production together. To support the livestock sector, the state should first of all prevent poverty in rural areas and increase development and sustainability.

Grunert (2005) studies on consumer quality perception using the Total Food Quality Model. Consumer risk perception and the relationship between food quality and reliability have been examined. The connection between quality and reliability perception, price perception, and willingness to pay the food and

consumer demand was established. As a result, food quality and reliability are a central issue in today's food economy

Jabarin (2005); Tosun and Hatirli (2009) used the logit model for analyzing the main socio-economic factors, affecting preferences of families with the purchase places of red meat

Akbay (2005) in his study "Econometric analysis of households' food consumption demand" determined that meat consumption rose due to an increase in the household income, in Kahramanmaras province of Turkey.

Bonne and Verbeke (2006) studied on Belgian Muslim's motivational structure and behavior towards fresh meat consumption in general and halal meat consumption in particular. In their study, the means-end chain (MEC) theory was used to investigate which attributes of fresh meat are important to Muslim consumers. Overall, health, faith, respect for animal welfare, enjoying life, and family care are the main goals Muslim consumers strive for when buying meat.

Karli and Bilgic (2007) determine factors, affecting the consumption of meat and meat products according to standard continuously demand models in Sanliurfa province.

Mutlu (2007), in his doctoral thesis entitled "Consumer Behavior in Food Security (Example of Red Meat Consumption in the Adana's Urban Area)" identified the factors influencing consumer safety decisions for red meat and meat products. According to the results of the study, the willingness of consumers to pay for red meats and certified products was 20% higher than the current price.

Yen et al. (2008) investigated the role of consumer information and socio-demographic factors in meat products collected in and out of the home in their study titled "Consumer Knowledge and Meat Consumption at Home and Away Home". In this research, the determination of how nutritional information affects the consumption of beef, pork, chicken, and fish products as well as the change-equality system of consumer information according to regional, seasonal, and other

factors were developed and estimated. According to the results of the study, it was observed that there was a decrease in the nutritional information in all regions (middle east, west, east) in the consumption of beef and pork outside the home and home. On the other hand, it is suggested that men consume fish meat at a higher rate than women, that meat consumption is in an inverse relationship with age, and that regional and ethnic differences affect meat consumption.

Yaylak et al. (2010) used the logistic regression method to determine beef, sheep, and goat meat consumption preferences (consume, not consume in Odemis town, Izmir. It is found out that gender, age, education, and income levels have a significant effect on choosing beef, sheep, and goat meat of consumers.

Kadanali et al. (2010) has analyzed the factors, affecting consumers' preferences for meat purchasing place. He found out that there is no relationship between the income level of consumers and choice of place of meat purchase.

Aydın et al. (2011), in their study in the period of 1985-2010 aimed to change the views in red meat prices within the framework of important economic events with butchering livestock and red meat imports in Turkey. Secondary data were used in the study. Red meat prices were converted to real prices by using purchasing power, consumer price index, and producer price index. They stated that the crises experienced and the changes in the policies applied in the livestock sector had a negative effect on the producers operating in the livestock sector. They concluded that the financial risk that increased in production as a result of the instability in animal and red meat prices before 2010 negatively affected the producers' expectations for the future. Finally state that if the current import decision was abandoned, prices would rise in the short term and an unstable environment would be formed in the long term.

Lorcu and Bolat (2012), in their study, have determined the factors that affect household red meat consumption as income, education, and the number of children, and have demonstrated how they affect the choice of red meat consumption. The research was conducted in the central district of Edirne. Kruskal

Wallis and ANOVA tests were used to investigate whether red meat consumption varies according to income groups, educational level and, the number of children in the household. According to the test results, the red meat consumption amount in proportion to the low-income group and the high-income group showed a change in the level of 5%, and education was demonstrated. On the other hand, since the significance level of 5% could not be achieved, it was reported that the number of children in the household did not affect red meat consumption. In the study, in determining the consumption preferences of households, which rounds of consumers prefer red meat, the reasons for choosing red meat and the criteria that they pay attention to when buying, the reasons for choosing the place of purchase with the purchased green are interpreted.

Meat consumption patterns have been changing in different ways around the world.

In the literature, it has been determined that there are many studies on the red meat sector and the main problems related to the sector, in general, are examined in these studies. But no studies in Adana about just red meat structure and consumer behavior was done.



3. MATERIAL AND METHODS

3.1. Material

In this study, two kinds of data were used. Primary data consist of a survey and secondary data from the literature.

The first part of the study was carried out to synthesize and interpret the sources in the literature and the databases of animal production and the red meat sector. For animal assets, the amount of red meat produced, the amount of red meat consumed per country and per capita, and red meat foreign trade data were used between 1990 and 2018. The number of animals slaughtered and the amount of red meat produced are from Turkey Statistical Institute (TURKSTAT), the FAO, and the United Nations International Trade Statistics Database for foreign trade data (UN Comtrade). Meat consumption data were used from the database of the Economic Cooperation and Development Organization (OECD). The reports prepared by the institutions for the supports and policies and secondary data obtained from the scanned literature were used.

In the study, data covering the years 1990-2018 was used. For red meat supply in the world; cattle, buffalo, sheep, goats, and pigs were used. But when using the data for Turkey, cattle, buffalo, sheep, and goat's data are used for red meat. Because of people's religious beliefs (Islam), we ignored pork production and consumption data.

For the second part of the study, primary data to determine consumer behavior toward red meat was used. The data were obtained from randomly selected 400 consumers using face to face questionnaire in Adana province. The questionnaire was carried out from April to June of 2019 in the city center of Adana.

To prepare the survey form of this research, questionnaires and previous studies on similar topics were investigated. Questions were formed under the purpose of the research.

The survey was made by using face to face interview technique. Households answer questions regarding their preferences of red meat consumption and provide socioeconomic information about factors affecting red meat consumption in the questionnaire form.

3.2. Methods

3.2.1. Sampling Method

The sample size of the research was 400 using the following equation. This method was used in many studies to achieve the maximum size of the sample (Armagan and Akbay, 2007; Pazarlioglu and al. 2007; Uzunoğlu and al. 2011).

$$n = \frac{Np(1 - p)}{(N - 1)\sigma_p^2 + p(1 - p)}$$

n = Sample size, N = population size, p = probability of the situation being searched (it is assumed 0.50 to reach maximum sample size),
 σ_p^2 = Probability variance.

The properties of the main mass of consumers forming are not known; therefore, the p-value will be 0.5 to maximize the volume of the sample, then the appropriate sample volume was determined.

3.2.2. Survey Steps

To give the possibility to all families living in the city center of Adana also to participate in the survey, the urban area of Adana has been separated into three parts; lower, average and higher households. The population living in these areas has been identified and the total volume of samples is three according to the population of the area. In this study, the sample number is 400 with a 5% margin of error and the level of reliability is 90%. But we conducted 412 investigations considering the possibility of non-evaluable investigations. Before the actual

implementation of the questionnaires, a preliminary application to test consumer competence and comprehensibility was carried out. Once the necessary arrangements have been made, the surveys are conducted with one family member per interview. The survey was conducted from May to June 2019 in the urban area of Adana.

3.2.3. Methodology for Data Evaluation

With the results obtained, after making the necessary calculations, the corresponding tables and graphs were made. Then commenting on this information, the structure of red meat consumption was determined in the urban area of Adana. Using the questionnaire, a large amount of data was collected from randomly selected families. Average monthly income and red meat consumption, annual income, and consumption were calculated by family.

3.2.3.1. Method used in macro data analysis

The reports prepared by the institutions for the supports and policies and secondary data obtained from the scanned literature were used to analyze the data. The corresponding tables and graphs was made. Then commenting on this information about red meat production, consumption, and trade in the world were made first. And secondly, red meat production, consumption, and trade in Turkey were made in that part. And we closed that part with policies towards the years in Turkey to improve red meat production.

3.2.3.2. Method used in microdata analysis

3.2.3.2.(1). Determination of sample volume

The people living in the center of Adana city constitutes the main population of the research. The sample size representing the main population was determined from the field research conducted, to determine the factors affecting the red meat consumption and consumption of households. For this purpose, a

sampling framework was established from the income of the families to enable the families of each size to be included in the sample. To determine the income level of the families in this research, a total of 400 people was interviewed and the average income was determined as 3 387.75 TL.

3.2.3.2.(2). Data analysis

The results obtained after the survey application are given as percentage distribution according to income groups in cross tables. The number of surveys carried out was divided into three groups in the determination of income groups, but it was concluded that the income level of the households did not show a normal distribution. The income levels of households are divided as 0-2500 TL (low-income group, 118), 2501 - 4000 TL (average-income group, 167), and 4001 TL and above (high-income group, 115). The chi-square test was used in the study to reveal that some of the results obtained as a percentage were statistically significant. Also, the binary logit model was used to reveal the consumers' preference for the market when buying red meat.

Chi-Square test X^2

The chi-square test is based on the timeline of whether the difference between observed frequencies and expected frequencies is statistically significant. The chi-square test uses qualitatively specified data. Besides, the chi-square test can be applied by describing the continuous variables specified by the measurement as less or more than a certain degree.

Chi-square test is usually,

- Test whether there is a difference between two or more groups,
- Test whether there is a connection between two variables,
- In homogeneity test between groups,
- In the test whether the distribution obtained from the sample complies with a desired theoretical distribution (Goodness of fit test),

- In the chi-square test for variance,
- Interval estimation about variance,
- It is used in calculating the quota coefficient.

In this study, chi-square was used for the independence test.

Independent Test

Whether there is a statistically significant relationship between two qualitative variables can be investigated by the Chi-square test. H_0 is not related which means they are independent. In H_1 , the relationship is claimed to be independent.

H_0 : Two variables are independent (no relationship)

H_1 : Two variables are dependent on each other (relationship).

The expected frequencies for calculating the test statistics are found. Test statistics,

$$X_{hes}^2 = \sum_{j=1}^c \sum_{i=1}^r \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = \sum_{j=1}^c \sum_{i=1}^r \frac{O_{ij}^2}{E_{ij}} - n$$

and $df = (r-1)(c-1)$ calculated.

Binary Logit Model

The binary logistic model was used to determine the factors affecting the purchase of household red meat in downtown Adana. In this model, the dependent variable is determined to be binary, not in the market or the market. Binary preference models assume that decision-makers (individuals, businesses, households, etc.) are faced with alternatives to choices and that their characteristics are affecting their choice. Consequently, such a model reveals the relationship between the characteristics of a decision unit and the possibility of making a certain choice (Özer, 2004). For this reason, we preferred to use a dual preference model in the study.

The dependent variable being the place of purchase of red meat, the following references were given, not the market as a place of purchase of red meat corresponds to 0 and the market to 1.

The methods of analysis that can be used in cases where the dependent variable can be binary (0, 1) are limited. These models are also called limited dependent variable models. Cankurt et al. (2010), used a logistic regression model in their study because of the ease of interpretation to determine which factors affect the amount of beef chosen. Logistic regression has been widely used, especially in recent years. This method is an alternative to linear regression analysis due to the perturbation of the normality assumption in the case of discrete variables with two classes or with multiple classes. Due to the absence of a hypothesis, as well as the ease of use, the model obtained from the solution is very flexible mathematically, an easy interpretation has increased the interest for the method (Özdamar, 1999; Özer, 2004).

When linear regression is defined as the two indicator variables Y (explained) (0, 1), the expected value of the error terms (e_i) is zero, $E(e_i) = 0$, and the variances are constant, $Var(e_i) = \sigma^2$ the hypothesis does not materialize. Consequently, the estimates obtained in the event of deviations from the assumptions will not be the best linear and non-deviant estimators. This insufficiency prevents the use of linear regression in classification analyzes (Ozdiñ, 1999). Therefore, logistic regression is considered a suitable method for situations where other regression methods do not provide the necessary assumptions and are one of the methods commonly used in classification analysis. Since logistic regression does not require the assumption of a multivariate normal distribution, it offers superiority in such applications (Cankurt et al., 2010).

It is easy to establish and interpret a regression model when there are few independent variables. However, as the number of independent variables included in the model increases, it is difficult and complex to build and solve the model. The more variables added to the model, the larger the predicted standard error, and the

more it depends on the observed dataset. For this reason, logistic regression is considered to be a suitable method for situations where the assumptions of other regression methods are not respected and it is one of the methods commonly used in classification analysis. Since logistic regression does not require the assumption of a multivariate normal distribution, it offers superiority in such applications. It also can determine the probability of belonging to a class.

While the dependent variable is discrete, the independent variable can receive both discrete and continuous values; the number of parameters in the function, the limitation of the independent variables to the distribution of the probability functions; the logistic regression method is preferred because of its advantages and flexibility, such as its resistance to hypothesis distortions (Anderson and Blair, 1982). The assumptions for the logistics model are briefly as follows:

$Y_1, \dots, Y_n$ values are statistically independent.

Independent variables (X_k) are independent of each other.

$Y_i \in (0, 1) \quad i = 1, 2, \dots, n$

$P(Y_i=1/X_i)=P_i \quad i = 1, 2, \dots, n$

Logistic regression has three basic methods (Tatlidil, 1996). These include binary logistic regression; ordinary logistic regression; nominal logistic regression. In this study, a binary logistic regression method will be used.

The logistic distribution function that describes the Logit model can be written as follows:

$$P_i = E(Y_i = 1 | X_i) = F(I_i) = F(\beta_0 + \beta_1 X_i) = \frac{1}{1 + e^{-I_i}} = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_i)}}$$

To explain the probability of the red meat buying a place in the market,

$$P_i = \ln \frac{P_i}{1-P_i} = I_i = \beta_0 + \beta_1 X_i$$

In the form of β_1 , the slope of the coefficient X_i will refer to the independent variables in X_i . Accordingly, it can be estimated how a unit change in X changes the logarithmic ratio of the likelihood of consumers choosing the market as the red meat buying a place to the likelihood of not choosing the market.

4. RESULTS AND DISCUSSION

4.1. Red Meat Sector in the World and Turkey

4.1.1. Red Meat Sector in the World

Farming; in addition to meeting basic needs such as feeding, sheltering, and dressing, is an activity that stands out with its low-cost employment in terms of the development of the country's economy and high return on unit investment. Although the share of animal husbandry in agriculture is higher than 50% in most of the developed countries, forage crops are given priority to support animal husbandry in crop production. The share of livestock activity in agricultural production is 70% in Germany and the UK and 60% in France and 49.4% in the EU (Peşmen and Yardımcı, 2008; Sevinç and Binici, 2016; Aydemir and Pıçak, 2017).

With the increase of the world's population, nutrition and food supply constitutes an important problem. Balanced and adequate nutrition of people and adequate animal protein consumption at this point has become an important topic of discussion for developed and developing countries (Anonymous, 2018a). Therefore, red meat has great importance in animal protein sources.

4.1.1.1. Red meat production

Red meat production in the world in 1990 was 134 697 396 tons. Which consists of 51.75% (69 701 012 tons) of pork, 39.37% (53 029 398 tons) of beef, 5.22% (7 033 484 tons) of sheep and 1.98% (2 666 651 tons) of goat and 1.68% (2 266 851 tons) of buffalo meat. In 2017, red meat production was 205 327 446 tons, 58.39% (119 886 758 tons) of pork, 32.27% (66 250 349 tons) of beef, 4.63% (9 498 356 tons) sheep meat, 2.85% (5 853 336 tons) goat meat and 1.87% (3 838 647 tons) consists of buffalo meat (Table 4.1.; Figure 4.1.).

While in 1990 red meat production increased by 52.44%, it was found that the share of pigs, goats, and buffaloes increased and the share of sheep and cattle decreased in total production. In 2017 compared to 1990 the production increased;

goat meat by 119.50%, pork production 72.00%, buffalo meat production 69.34%, sheep meat production 35.04%, and beef by 24.93% (Table 4.1.).

It is noticeable that pork production has such a significant share (58.39%) in red meat production in the world. The reasons for this are; the cost of production per animal as well as production facilitating factors, such as high feed efficiency of non-ruminant pigs, being able to consume food waste, having three births per year, the average number of offspring varying between 10 and 12 and newborn pups becoming mature in 7-8 months.

Table 4.1. Production of cattle, buffaloes, goats, sheep and pork between 1990-2017 products in the world (tons)

Years	Meat Production According to Animal Species					Total
	Beef	Buffalo Meat	Goat meat	Mutton	Pork	
1990	53029398	2266851	2666651	7033484	69701012	134697396
1991	53518870	2334810	2743364	7122480	71266032	136985556
1992	52653848	2403796	2854343	7120357	73323778	138356122
1993	52042880	2507575	2956579	7137506	75750763	140395303
1994	51877994	2620576	3064117	7226200	79289791	144078678
1995	52588675	2712295	3316946	7211527	83963063	149792506
1996	53625051	2557061	3172669	7056372	79294017	145705170
1997	54671206	2705361	3374078	7218701	83202001	151171347
1998	54194272	2745200	3600944	7425913	88793964	156760293
1999	55060315	2822761	3717439	7545030	90787504	159933049
2000	55813199	2861292	3775943	7833175	89873292	160156901
2001	55404571	2862720	3806593	7840712	90761759	160676355
2002	56457649	2962742	3852856	7801532	93173505	164248284
2003	57366224	2902986	4116163	7862800	95607978	167856151
2004	58971035	2993193	4405435	7937984	96657436	170965083
2005	59296492	3088412	4633446	8112484	98784115	173914949
2006	60488664	3213477	4573730	8374688	100759753	177410312
2007	62345022	3328901	4724291	8736583	99363744	178498541
2008	62500934	3364985	4841525	8522093	103563936	182793473
2009	62877923	3425423	4960428	8530636	106148192	185942602
2010	63129210	3580077	5113788	8428938	108972569	189224582
2011	62952882	3615407	5082773	8527750	109623889	189802701
2012	63583921	3665570	5218552	8595489	113126600	194190132
2013	64734233	3707134	5326198	8825330	115104163	197697058
2014	65265112	3721374	5439285	9013626	117248409	200687806
2015	65175228	3758919	5601748	9323241	119528582	203387718
2016	65663119	3797168	5713897	9430411	118907268	203511863
2017	66250349	3838647	5853336	9498356	119886758	205327446

Source: FAO, 2017b

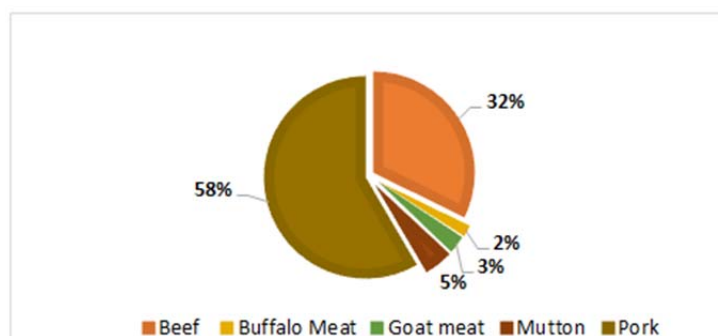


Figure 4.1. Distribution of red meat production in the world by animal breeds in 2017 (FAO, 2017b)

In 2017, China ranked first in red meat production, with 32.36% (66 453 900 tons) of world red meat production, while the USA ranked second with 11.49% (23 595 357 tons), Brazil third with 6.57% (13 493 775 tons) and Turkey with 0.55% (1,126,404 tons) ranks 26 (Table 4.2.).

Table 4.2. Red meat production by countries between 2013 and 2017 * (ton)

Order	Country	Red Meat Production by Years				
		2013	2014	2015	2016	2017
1	China	65743700	67888400	67863200	66016200	66453900
2	USA	22396377	22148581	21977637	22869894	23595357
3	Brazil	12907887	13032091	12977340	13117327	13493775
4	Germany	6656872	6701317	6735410	6777125	6674150
5	Russia	4639404	4831964	4952540	5200284	5365075
6	Spain	4139255	4263666	4605746	4945062	5068581
7	Vietnam	3607677	3740045	3889318	4071663	4159402
8	France	3654347	3653439	3716810	3760118	3676148
9	India	3681391	3666152	3590568	3584199	3563319
10	Mexico	3188066	3215789	3266574	3354797	3470135
26	Turkey	996125	1008273	1149263	1173042	1126404

* Production of beef, buffalo, goat, sheep and pork

Source: FAO, 2017b; TÜİK, 2018a

US beef production was 17.97% (11 907 239 tons) of world beef production in 2017, while Brazil ranked second with 14.42% (9 550 000 tons), China ranked third with 10.41% (6 898 000 tons). Turkey 1.49% (987 482 tons) and ranks 11th (Table 4.3.).

Table 4.3. Beef production (tons) by country between 2013 and 2017

Order	Country	Beef Production by Years				
		2013	2014	2015	2016	2017
1	USA	11788608	11698116	10777601	11470607	11907239
2	Brazil	9675000	9723000	9425000	9284000	9550000
3	China	6395500	6552400	6655900	6809000	6898000
4	Argentina	2821608	2674000	2727000	2644000	2842000
5	Australia	2359064	2595149	2661640	2315994	2048517
6	Mexico	1806758	1827152	1845236	1878705	1926901
7	Russia	1633258	1654135	1649373	1618972	1613647
8	France	1400331	1410854	1447906	1458284	1423404
9	Germany	1116507	1142603	1132340	1155483	1137008
10	South Africa	953107	1000659	1072800	1089690	1014050
11	Turkey	869292	881999	1014926	1059195	987482

Source: FAO, 2017b

In 2017, buffalo meat was produced in 29 countries worldwide (FAO, 2017b). In 2017, 42.60% of the world's buffalo meat production (1 635 153 tons) was performed by Indian which ranks them first producer, Pakistan with 24.20 % (929 000 tonnes) the second, China with 9.45% (362 700 tonnes) the third and Turkey with 0.03% (1 339 tons) ranks in the 19th place (Table 4.4.).

Table 4.4. Production of buffalo meat (ton) by country between 2013 and 2017

Order	Country	Buffalo Meat Production by Years				
		2013	2014	2015	2016	2017
1	India	1610000	1614954	1594045	1616618	1635153
2	Pakistan	825000	844000	868000	895000	929000
3	China	336500	340000	345000	358600	362700
4	Egypt	389707	380000	407119	375293	359954
5	Nepal	175132	173906	174012	175005	180080
6	Philippines	99119	100078	99033	102009	102116
7	Vietnam	85495	85658	85776	86630	87959
8	Myanmar	45900	44144	44709	46944	48926
9	Indonesia	37837	35237	35410	31905	32260
10	Thailand	29790	28306	29336	31208	24239
19	Turkey	336	526	326	351	1339

Source: FAO, 2017b

In 2017, China with 39.14% of the world goat meat production (2 291 000 tons) took the first place in production, India with 8.54% (499 673 tonnes) is the second, Pakistan with 5.69% (333 000 tonnes) third and Turkey with 0.64% (37 525 tons) took the 27th place (Table 4.5.).

Table 4.5. Goat meat production by country between 2013 and 2017 (tons)

Order	Country	Goat Meat Production				
		2013	2014	2015	2016	2017
1	China	2000000	2098100	2160100	2250900	2291000
2	India	509000	505001	498680	504466	499673
3	Pakistan	304000	309000	317000	326000	333000
4	Nigeria	238610	244575	250699	243082	247966
5	Bangladesh	204327	208600	207900	208735	222674
6	Chad	27000	24250	101000	106627	113271
7	Sudan	115000	115000	116000	111509	107625
8	Finland	77840	82314	84000	92000	98000
9	Myanmar	58472	66445	77000	79418	89178
10	Mongolia	64134	60548	86356	76903	80813
27	Turkey	23554	26770	33990	31011	37525

Source: FAO, 2017b; TÜİK, 2018a

In 2017, with 25.10% of the world sheep meat production (2 384 200 tons), China ranks first in the world production, Australia with 7.05% (669 604 tons) second, New Zealand with 4.75% (451 276 tonnes) third, and Turkey with 1.05% (100 058 tons) ranks the 24th place (Table 4.6.).

Table 4.6. Sheep meat production (ton) by country between 2013 and 2017

Order	Country	Sheep Meat Production by Years				
		2013	2014	2015	2016	2017
1	China	2081400	2184000	2248200	2342700	2384200
2	Australia	660437	720600	721053	712525	669604
3	New Zeland	480619	487142	487149	480607	451276
4	England	289000	298000	302000	290000	298000
5	Iranian	260000	276000	313570	287000	291200
6	Algeria	279963	281130	269839	267997	269387
7	Sudan	249000	251000	253000	254288	255571
8	India	237600	235205	231745	239145	234518
9	Uzbekistan	166000	177000	191200	196843	228654
10	Russia	173323	186386	186838	194510	203074
24	Turkey	102943	98978	100021	82485	100058

Source: FAO, 2017b; TÜİK, 2018a

In 2017, China with 45.47% (54 518 000 tons) of pork production ranks first, while the USA ranked second with 9.69% (11 611 177 tons), and Germany ranked third with 4.59% (5 502 572 tons) (Table 4.7.). After 2005 related to pork production in Turkey does not have any data (TurkStat, 2018).

Table 4.7. Production of pork by countries between 2013 and 2017 (tons)

Order	Country	Pork Production by Years				
		2013	2014	2015	2016	2017
1	China	54930300	56713900	56454000	54255000	54518000
2	USA	10524535	10368227	11120748	11320285	11611177
3	Germany	5506772	5527769	5570490	5589639	5505572
4	Spain	3431214	3555606	3854658	4181091	4298893
5	Brazil	3117087	3192918	3430734	3711235	3824682
6	Vietnam	3228670	3351200	3491600	3664556	3733349
7	Russia	2816178	2973928	3098678	3368235	3529610
8	Canada	1981460	1962760	2063622	2085896	2141807
9	France	2130578	2120315	2148452	2185430	2136276
10	Poland	1775500	1864500	1976000	2008800	2047800

Source: FAO, 2017b

4.1.1.2. Red meat consumption

Red meat consumption in the world in 1990 was 121 068 410 tons. 53.35% (64 591 450 tons) of pork, 39.41% (47 714 500 tons) of large ruminants' meat and 7.24% (8 762 460 tons) of small ruminants. Red meat consumption in 2017 was 202 083 290 tons, 58.57% (118 361 490 tons) of pork, 34.20% (69 107 900 tons) of large ruminants' meat, 7.23% (14 613 900 tons) is composed of small ruminants' meat (Table 4.8.; Figure 4.2.).

Red meat consumption in general increased by 66.92% in 2017 compared to 1990; pork consumption by 83.25%, small ruminants' meat 66.78%, and large ruminants' meat by 44.84% (Table 4.8.). It is seen that the consumption of pork is increasing rapidly in parallel with the supply of pork in the world.

Table 4.8. Consumption of large ruminant, small ruminant and pork in the world between 1990 and 2017 (tons)

Years	Red Meat Consumption by Animal Groups			Total
	Large ruminants Meat	Small ruminants Meat	Pork	
1990	47714500	8762460	64591450	121068410
1991	49223600	9139650	66642930	125006180
1992	53510800	9538610	69205690	132255100
1993	54111900	9866630	74915720	138894250
1994	55568600	10118900	78008070	143695570
1995	55995500	10353110	78689240	145037850
1996	56084900	10002890	78415460	144503250
1997	57390700	10388250	82578680	150357630
1998	57588100	10741330	87885640	156215070
1999	58733400	10886210	87813540	157433150
2000	58761200	11311780	89876090	159949070
2001	57673000	11395850	91979820	161048670
2002	60034800	11642800	95211030	166888630
2003	60312400	11534870	94839420	166686690
2004	61407900	11891260	95765220	169064380
2005	62161400	12326670	98444440	172932510
2006	64398000	12677590	101079940	178155530
2007	65969900	13031860	100061860	179063620
2008	65320900	13039200	102935800	181295900
2009	65018600	13076430	104652630	182747660
2010	65363300	13088200	106995310	185446810
2011	64638000	13048690	107489470	185176160
2012	65434800	13323070	110467140	189225010
2013	66716900	13683290	113029500	193429690
2014	66322000	14105110	115358720	195785830
2015	66820300	14265070	116204980	197290350
2016	68002800	14429710	117494740	199927250
2017	69107900	14613900	118361490	202083290

Source: OECD, 2018a

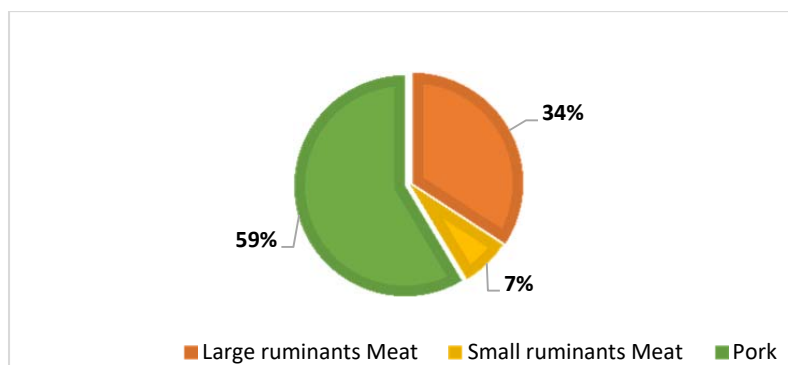


Figure 4.2. Distribution of red meat consumption in the world by animal groups as of 2017 (OECD, 2018a)

In 2017 China share of red meat consumption is 33.42% (67 541 089 tons), USA 10.78% (21 785 421 tons), Brazil 5.41% (10 933 042 tons), EU (EU28) 14.80% (29 907 258 tons) and Turkey 0.78% (1,584,026 tons) (Table 4.9.).

Table 4.9. Red meat consumption between 2013-2017 according to EU and selected countries * (ton)

Country	Red Meat Consumption by Years				
	2013	2014	2015	2016	2017
China	64608221	66687594	65569684	66947450	67541089
USA	20392256	20011737	20772522	21310653	21785421
Brazil	10669439	10413642	11090188	10784603	10933042
Russia	6295020	6056324	5948990	6221133	6298590
Vietnam	4477343	4840678	4928194	5008931	5084480
Japan	3634850	3656973	3659177	3770387	3854387
Mexico	3489133	3414682	3581639	3658390	3732658
Argentina	3138692	2999702	3054535	3053450	3167860
India	1911257	1707087	1968992	2067896	2045837
Canada	1758981	1698528	1709586	1691260	1718342
EU Countries	28941708	29518709	30092773	29956562	29907258
Turkey	1198332	1246133	1410414	1493281	1584026

*Consumption of large ruminants, small ruminants and pork. Source: OECD, 2018a

4. RESULTS AND DISCUSSION

SORO N'djambieri Yacouba

In 2017, the consumption of large ruminants' meat in China was 11.40% (7 881 000 tons), USA 17.38% (12 011 600 tons), Brazil 11.22% (7 752 800 tons), EU (EU28) 11.45% (7 913 800 tons) and Turkey 1.73% (1 194 000 tons) (Table 4.10.).

Table 4.10 Cattle red meat consumption in 2013-2017 compared to EU and selected countries (tons)

Country	Large ruminants Meat Consumption by Years				
	2013	2014	2015	2016	2017
China	7035600	7210000	7250400	7713000	7881000
USA	11569100	11211300	11276300	11678400	12011600
Brazil	7640100	7151600	7773900	7645200	7752800
Russia	2535500	2498700	2345400	2227900	2204000
Vietnam	1113100	1339700	1308300	1310500	1355700
Japan	1233100	1224700	1186000	1231600	1305800
Mexico	1639500	1532100	1556400	1609700	1627200
Argentina	2655300	2503800	2521600	2441000	2507000
India	830400	639100	903000	1003700	984100
Canada	985000	926200	841200	904300	904200
EU Countries	7564400	7683500	7758900	7940900	7913800
Turkey	846400	867300	1023900	1101600	1194000

Source: OECD, 2018a

Small ruminant consumption in the world in 2017; China accounted for has a share of 33.61% (4 912 000 tons), USA 1.07% (156 290 tons), Brazil 0.86% (126 000 tons), EU (EU28) 7.17% (1 048 330 tons) and Turkey 2.62% (382 990 tons) (Table 4:11.).

Table 4.11. Small ruminants red meat consumption in 2013-2017 compared to EU and selected countries (tons)

Country	Small ruminants Meat Consumption by Years				
	2013	2014	2015	2016	2017
China	4336910	4560500	4571260	4816520	4912000
USA	139120	150420	154930	155790	156290
Brazil	124660	126110	123450	124390	126000
Russia	200480	212870	209190	214220	233590
Vietnam	9270	9360	9160	9100	9080
Japan	18170	20390	18510	20050	21100
Mexico	74960	74990	76710	73690	74520
Argentina	57150	57150	59530	60450	60860
India	726760	717550	708970	706760	703050
Canada	35200	37310	37200	36930	37460
EU Countries	1031360	1021140	1069770	1063820	1048330
Turkey	351260	376740	378990	380990	382990

Source: OECD, 2018a

In 2017, pork consumption in the world was for China 46.25% (54 748 089 tons), USA 8.13% (9 617 531 tons), Brazil 2.58% (3 054 242 tons), and EU (EU28) 17.70% (20 945 128 tons) (Table 4.12.).

Table 4.12. Pork consumption in 2013-2017 by EU and selected countries (tons)

Country	Pork Meat Consumption by Years				
	2013	2014	2015	2016	2017
China	53235711	54917094	53748024	54417930	54748089
USA	8684036	8650017	9341292	9476463	9617531
Brazil	2904679	3135932	3192838	3015013	3054242
Russia	3559040	3344754	3394400	3779013	3861000
Vietnam	3354973	3491618	3610734	3689331	3719700
Japan	2383580	2411883	2454667	2518737	2527487
Mexico	1774673	1807592	1948529	1975000	2030938
Argentina	426242	438752	473405	552000	600000
India	354097	350437	357022	357436	358687
Canada	738781	735018	831186	750030	776682
EU Countries	20345948	20814069	21264103	20951842	20945128

Source: OECD, 2018a

Red meat consumption per capita in the world in 1990 was 17.84 kg. 55.10% (9.83 kg) of this consumption consists of pork, 36.49% (6.51 kg) of large ruminant meat, and 8.41% (1.5 kg) of small ruminant meat. The average red meat consumption per capita in 2017 was 20.35 kg, with 60.15% (12.24 kg) of pork, 31.50% (6.41 kg) of cattle, and 8.35% (1.7 kg) of sheep. (Table 4.13.; Figure 4.3.).

In 2017, red meat consumption increased by 14.07% compared to 1990. While pork consumption increased by 24.52% and small ruminant's consumption increased by 13.33%, large ruminants consumption decreased by 1.54%. (Table 4.13.).

Table 4.13. Consumption of large ruminant, small ruminant and pork in the world between 1990 and 2017 (kg)

Years	Red Meat Consumption Per Capita According to Animal Groups			Total
	Large ruminants' meat	Small ruminants' meat	Pork	
1990	6.51	1.50	9.83	17.84
1991	6.61	1.54	9.97	18.12
1992	6.89	1.54	9.93	18.36
1993	6.80	1.56	10.48	18.84
1994	6.88	1.57	10.76	19.21
1995	6.83	1.59	10.70	19.12
1996	6.75	1.51	10.51	18.77
1997	6.81	1.55	10.92	19.28
1998	6.75	1.58	11.47	19.80
1999	6.79	1.58	11.32	19.69
2000	6.71	1.62	11.43	19.76
2001	6.50	1.62	11.55	19.67
2002	6.68	1.63	11.81	20.12
2003	6.63	1.59	11.62	19.84
2004	6.67	1.62	11.59	19.88
2005	6.67	1.66	11.76	20.09
2006	6.81	1.69	11.91	20.41
2007	6.89	1.71	11.65	20.25
2008	6.74	1.69	11.83	20.26
2009	6.63	1.68	11.88	20.19
2010	6.58	1.66	12.00	20.24
2011	6.43	1.63	11.91	19.97
2012	6.43	1.65	12.10	20.18
2013	6.48	1.67	12.23	20.38
2014	6.36	1.70	12.34	20.40
2015	6.34	1.70	12.28	20.32
2016	6.38	1.70	12.28	20.36
2017	6.41	1.70	12.24	20.35

Source: OECD, 2018a

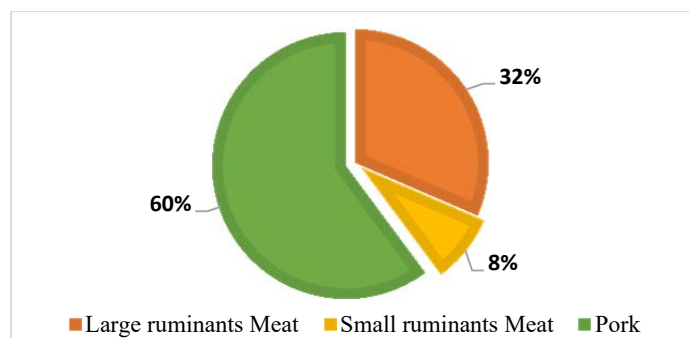


Figure 4.3. Distribution of red meat consumption per capita in the world by animal groups in 2017 (OECD, 2018a)

In 2017; an individual average of 37.28 kg of red meat is consumed in China, the United States 49.45 kg and 37.84 kg in Brazil, the EU (EU28) 44.79 kg, and Turkey is 14.59 kg. Turkey's per capita consumption of red meat compared with the world average (20.35 kg) is far below (Table 4:14.).

Table 4.14. Red meat consumption per capita between 2013-2017 according to EU and selected countries * (kg)

Country	Red Meat Consumption Per Capita By Years				
	2013	2014	2015	2016	2017
China	36.35	37.33	36.52	37.11	37.28
USA	47.53	46.36	47.87	48.74	49.45
Brazil	38.15	37.03	39.04	37.63	37.84
Russia	32.92	31.62	31.09	32.62	33.06
Vietnam	37.21	39.65	39.98	40.22	40.38
Japan	21.35	21.51	21.58	22.27	22.78
Mexico	21.21	20.51	21.26	21.42	21.6
Argentina	52.69	49.91	50.38	50	51.42
India	1.17	1.05	1.17	1.21	1.18
Canada	36.79	35.23	35.32	34.46	34.72
EU Countries	43.6	44.41	45.24	44.94	44.79
Turkey	11.91	12.2	13.5	14.03	14.59

Large ruminants, small ruminant ve pork meat consumption is considered
Source: OECD, 2018a

In 2017; an individual average of 3.91 kg of large ruminants is consumed in China, the United States 25.91 kg and 25.93 kg in Brazil, the EU (EU28) 10.88 kg and Turkey consumption is 10.5 kg (Table 4.15.).

Table 4.15. Large ruminant meat consumption per capita between 2013-2017 according to EU and selected countries (kg)

Country	Large ruminants Meat Consumption Per Person by Years				
	2013	2014	2015	2016	2017
China	3.56	3.63	3.63	3.85	3.91
USA	25.67	24.70	24.67	25.37	25.91
Brazil	26.42	24.51	26.42	25.77	25.93
Russia	12.36	12.17	11.41	10.83	10.71
Vietnam	8.52	10.13	9.79	9.70	9.93
Japan	6.73	6.69	6.49	6.75	7.17
Mexican	9.37	8.63	8.65	8.83	8.82
Argentina	43.69	40.78	40.66	38.97	39.64
India	0.45	0.35	0.48	0.53	0.51
Canada	19.56	18.21	16.38	17.44	17.28
EU Countries	10.46	10.61	10.70	10.94	10.88
Turkey	7.82	7.88	9.16	9.70	10.35

Source: OECD, 2018a

In 2017; an individual average of 3.07 kg small ruminants is consumed by China, the United States 0.42 kg, Brazil 0.53 kg, the EU (EU28) 4.17 kg, and Turkey 1.81 kg (Table 4:16.). Turkey is in the world average per capita consumption of large ruminants and small ruminants. Because of Turkey's religious belief (Islam), there is no pork consumption so large ruminant and small ruminant consumption are made in a more intense way than other countries.

Table 4.16. Per capita small ruminant red meat consumption in 2013-2017 compared to EU and selected countries (kg)

Country	Small ruminant Meat Consumption Per Person by Years				
	2013	2014	2015	2016	2017
China	2.76	2.89	2.88	3.02	3.07
USA	0.39	0.42	0.43	0.43	0.42
Brazil	0.54	0.54	0.53	0.53	0.53
Russia	1.23	1.30	1.28	1.31	1.43
Vietnam	0.09	0.09	0.09	0.09	0.08
Japan	0.13	0.14	0.13	0.14	0.15
Mexico	0.54	0.53	0.54	0.51	0.51
Argentina	1.18	1.17	1.21	1.21	1.21
India	0.50	0.49	0.48	0.47	0.46
Canada	0.88	0.92	0.91	0.90	0.90
EU Countries	1.79	1.77	1.86	1.84	1.81
Turkey	4.08	4.30	4.26	4.22	4.17

Source: OECD, 2018a

In 2017; In China, an individual consumes an average of 30.30 kg of pork, while 23.12 kg in the USA, 11.38 kg in Brazil, and 32.10 kg in the EU (EU28) (Table 4.17.).

Table 4.17. Pork consumption per capita between 2013 and 2017 by EU and selected countries (kg)

Country	Per capita consumption of pork by years				
	2013	2014	2015	2016	2017
China	30.03	30.81	30.01	30.24	30.30
USA	21.47	21.24	22.77	22.94	23.12
Brazil	11.19	11.98	12.09	11.33	11.38
Russia	19.33	18.15	18.40	20.48	20.92
Vietnam	28.60	29.43	30.10	30.43	30.37
Japan	14.49	14.68	14.96	15.38	15.46
Mexico	11.30	11.35	12.07	12.08	12.27
Argentina	7.82	7.96	8.51	9.82	10.57
India	0.22	0.21	0.21	0.21	0.21
Canada	16.35	16.10	18.03	16.12	16.54
EU Countries	31.35	32.03	32.68	32.16	32.10

Source: OECD, 2018a

4.1.1.3. Foreign trade of red meat

4.1.1.3.(1). Red meat imports

In 1990, a total of 24 386 865 000 red meat (large ruminants, small ruminants and pork) was imported. Among the total import value, large ruminants had a share of 59.26% (12 450 657 000 \$), pork 32.24% (\$ 7 863 505 000) and small ruminants had a share of 8.50% (2 072 703 000). In 2018, total import is \$ 59 996 380 000, with 54.43% (\$ 32 658 204 000) of large ruminants, 37.22% (\$ 22 333 465 000) of pork and 8.34% (of 5 004. 711 000 \$) consists of imports of small ruminants (Table 4.18.; Figure 4.4.).

Imports of red meat (large ruminants, small ruminants' meat, and pork) increased by 146.02% in 2018 compared to 1990. Pork imports increased by 184.01%, small ruminant meat by 41.46%, and large ruminant meat by 126.00% (Table 4.18.).

Table 4.18. Import values of large ruminants, small ruminants and pork between the years 1990-2018 (thousand \$)

Years	Red Meat Import Values by Animal Groups			Total
	Large ruminants' meat	Small ruminants' meat	Pork	
1990	14 450 657	2 072 703	7 863 505	24 386 865
1991	14 763 821	1 998 426	8 279 544	25 041 791
1992	15 966 139	2 158 095	9 376 246	27 500 480
1993	14 661 221	2 040 960	7 983 892	24 686 073
1994	15 577 334	2 152 590	8 988 483	26 718 407
1995	15 700 909	2 309 026	10 548 371	28 558 306
1996	13 661 850	2 605 354	11 885 767	28 152 971
1997	13 948 946	2 542 921	10 478 305	26 970 172
1998	13 723 683	2 358 606	9 349 943	25 432 232
1999	14 188 109	2 218 145	9 343 860	25 750 114
2000	14 265 129	2 292 650	10 328 928	26 886 707
2001	12 644 760	2 314 715	11 280 802	26 240 277
2002	13 820 179	2 578 859	11 841 002	28 240 040
2003	16 219 800	3 113 733	13 359 629	32 693 162
2004	18 110 358	3 632 290	16 745 145	38 487 793
2005	20 174 696	4 138 707	18 158 213	42 471 616
2006	22 864 805	4 156 706	19 204 877	46 226 388
2007	26 190 850	4 437 293	20 943 867	51 572 010
2008	30 185 500	5 048 763	26 245 387	61 479 650
2009	28 016 162	4 736 479	23 668 364	56 421 005
2010	30 084 430	5 294 661	24 913 599	60 292 690
2011	34 925 404	6 349 202	29 256 942	70 531 548
2012	35 322 782	5 874 191	30 111 432	71 308 405
2013	38 488 639	6 479 684	29 556 366	74 524 689
2014	42 448 266	7 390 561	30 266 089	80 104 916
2015	40 756 822	6 370 031	24 885 208	72 012 061
2016	37 951 983	5 807 354	27 331 148	71 090 485
2017	40 581 070	6 380 106	29 363 060	76 324 236
2018	32 658 204	5 004 711	22 333 465	59 996 380

Source: FAO 2017d; UN Comtrade, 2019

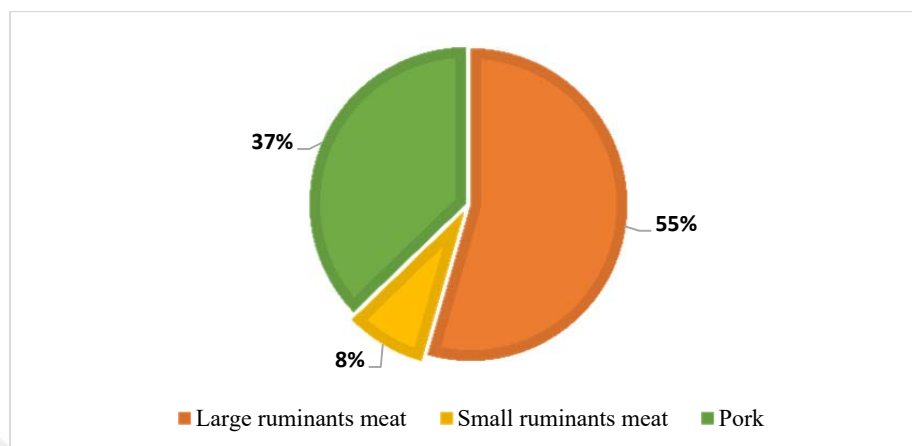


Figure 4.4. Distribution of world red meat import values by animal groups in 2018 (UN Comtrade, 2019)

In 1990, a total of 8 078 057 tons of red meat (large ruminant, small ruminants and pork) were imported. Among these imports, large ruminants accounted for 55.28% (4 465 599 tonnes), pork 34.37% (2 776 245 tonnes) and small ruminants 10.35% (836 213 tonnes). In 2018, total imports amounted to 15 632 593 tons; with 55.98% (8 750 753 tons) of pork, 39.76% (6 215 685 tons) of large ruminant and 4.26% (666 155 tons) small ruminant (Table 4.19.; Figure 4.5.).

In 2018, imports of red meat (large ruminant, small ruminant meat and pork) increased by 93.52% compared to 1990. Imports of pork increased by 215.20% and large ruminant by 39.19%, while imports of small ruminants decreased by 20.34% (Table 4.19.).

Table 4.19. Imports of large ruminants, small ruminants and pork between 1990 and 2018 (tons)

Years	Imports of Red Meat by Animal Groups			Total
	Large ruminants meat	Small ruminants meat	Pork	
1990	4 465 599	836 213	2 776 245	8 078 057
1991	4 745 916	854 940	2 947 131	8 547 987
1992	5 087 164	875 704	3 055 789	9 018 657
1993	4 835 496	816 811	3 174 887	8 827 194
1994	5 130 723	822 060	3 509 110	9 461 893
1995	4 863 200	852 336	3 545 682	9 261 218
1996	4 855 060	885 363	3 847 855	9 588 278
1997	5 188 604	840 290	3 869 930	9 898 824
1998	5 016 472	889 735	4 502 026	10 408 233
1999	5 328 211	871 422	4 942 153	11 141 786
2000	5 537 175	938 323	5 062 260	11 537 758
2001	5 012 048	848 498	5 215 739	11 076 285
2002	5 531 274	870 416	5 810 737	12 212 427
2003	5 646 398	876 239	6 214 016	12 736 653
2004	5 678 110	939 059	6 640 494	13 257 663
2005	6 083 363	974 721	7 104 527	14 162 611
2006	6 257 014	1 013 605	7 418 363	14 688 982
2007	6 711 389	1 030 391	7 911 861	15 653 641
2008	6 515 334	1 067 617	8 954 726	16 537 677
2009	6 575 646	989 476	8 677 531	16 242 653
2010	6 707 695	956 555	9 028 165	16 692 415
2011	6 651 806	923 942	9 627 243	17 202 991
2012	6 656 183	956 939	9 809 443	17 422 565
2013	7 179 839	1 142 665	9 750 045	18 072 549
2014	7 925 352	1 208 778	10 237 602	19 371 732
2015	7 891 360	1 146 762	10 491 679	19 529 801
2016	7 786 036	1 114 842	11 285 660	20 186 538
2017	7 516 427	1 093 992	11 079 352	19 689 771
2018	6 215 685	666 155	8 750 753	15 632 593

Source: FAO 2017d; UN Comtrade, 2019

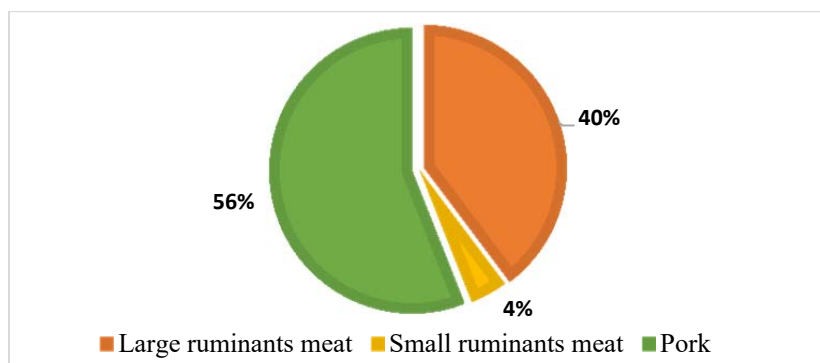


Figure 4.5. Distribution of the world's red meat imports by animal groups in 2018 (UN Comtrade, 2019)

In the countries that import large ruminant in 2018; based on import value, the US ranked first with a share of 16.17% (\$ 5 281 951 000), while Japan ranked second with a share of 10.64% (\$ 3 474 030 000) and Italy with a share of 7.00 % (\$ 2 285 687 000) third (Figure 4.6.). According to the number of imports, the USA has a share of 15.56%, Japan has a share of 9.77% and Italy has a share of 6.18%.

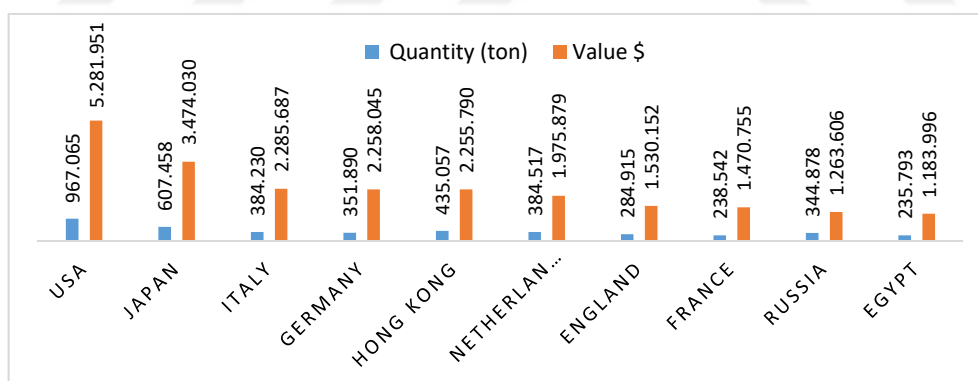


Figure 4.6. Imports (tons) and values of large ruminant red meat by countries in 2018 (thousand US dollars) (UN Comtrade, 2019)

In 2018, from the countries that import small ruminants; based on import value, the USA ranked first with a share of 20.63% (\$ 1 032 717 000), while France ranked second with a share of 11.48% (\$ 574 354 000) and the United Kingdom with a share of 9.97% (\$ 498 749 000) ranked third (Figure 4.7.). According to the number of imports, the USA has a share of 18.75%, Japan has a share of 12.48% and Italy has a share of 11.67%.

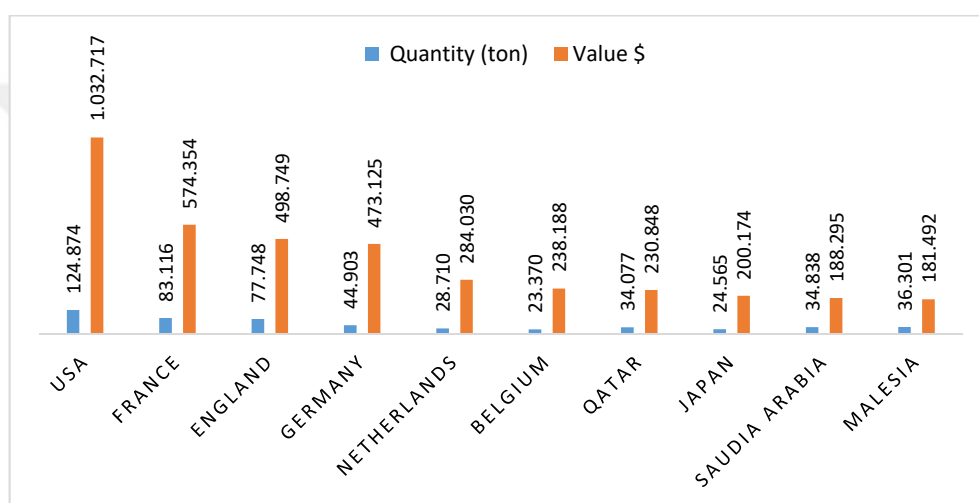


Figure 4.7. Imports (tons) and values of small ruminant meat by countries in 2018 (thousand US dollars) (UN Comtrade, 2019)

In 2018, the countries that import pork; based on import value, Japan ranked first with a share of 19.72% (\$ 4 404 923 000), while Italy ranked second with a share of 9.45% (\$ 2 109 934 000) and Germany with a share of \$ 7.60 (\$ 1 698 209 000) ranked third (Figure 4.8.). According to the amount of imports Japan has a share of 10.57%, Italy has a share of 11.49% and Germany has a share of 10.54%.

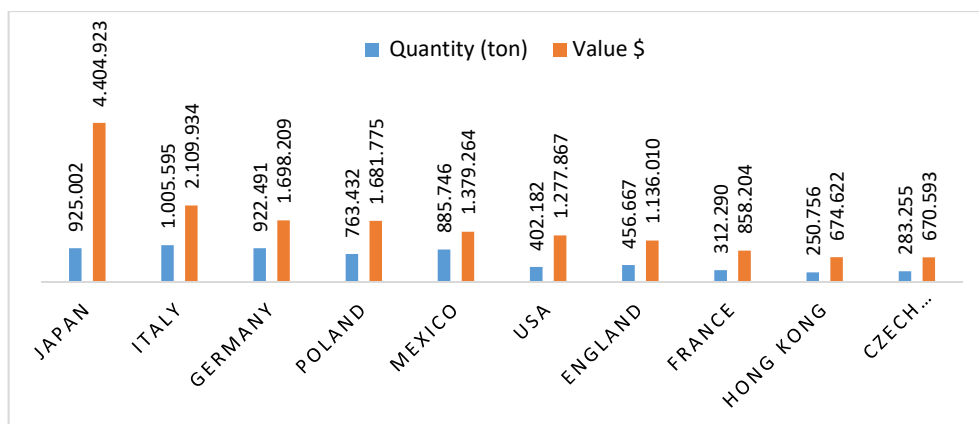


Figure 4.8. Imports (tons) and values of pork by countries in 2018 (thousand US dollars) (UN Comtrade, 2019)

4.1.1.3.(2). Red meat exports

Red meat (large ruminant, small ruminant, and pork) worth \$ 22 813 557 000 was exported worldwide in 1990. The share of large ruminant in the total export value was 58.79% (13 413 071 000 \$), pork 33.56% (\$ 7 655 689 000) and small ruminants was 7.65% (\$ 1 744 797 000).

In 2018, total exports amounted to \$ 66 696 855 000; 58.78% (39 204 938 000) of large ruminants, 34.31% (\$ 22 885 832 000) of pork, 6.91% (4 606 085 000 \$) consists of small ruminants (Table 4.20.; Figure 4.9.).

In 2018, red meat (large ruminant, small ruminant meat, and pork) exports increased by 192.36% compared to 1990. Pork exports increased by 198.94%, large ruminants by 192.29%, and small ruminants by 163.99% (Table 4.20.).

Table 4.20. Export values of large ruminants, small ruminants and pork between 1990-2018 (thousand \$)

Years	Red Meat Export Values by Animal Groups			Total
	Large ruminant meat	Small ruminant meat	Pork	
1990	13 413 071	1 744 797	7 655 689	22 813 557
1991	14 150 454	1 802 280	8 237 294	24 190 028
1992	15 259 326	1 980 812	9 097 892	26 338 030
1993	14 102 397	1 915 287	7 738 577	23 756 261
1994	15 258 316	1 977 933	9 221 506	26 457 755
1995	15 618 062	2 022 729	10 684 975	28 325 766
1996	13 064 490	2 293 849	11 961 980	27 320 319
1997	13 457 597	2 426 123	10 605 364	26 489 084
1998	13 063 661	2 066 858	8 851 417	23 981 936
1999	14 197 919	2 015 781	9 027 514	25 241 214
2000	14 008 613	2 114 279	9 603 129	25 726 021
2001	12 368 387	2 232 677	10 873 952	25 475 016
2002	13 673 837	2 451 682	10 550 133	26 675 652
2003	16 273 857	3 029 757	12 250 950	31 554 564
2004	18 236 191	3 564 565	15 958 380	37 759 136
2005	20 709 371	4 085 585	17 971 863	42 766 819
2006	23 235 746	4 119 786	19 272 321	46 627 853
2007	25 627 666	4 343 123	21 359 796	51 330 585
2008	31 173 074	4 776 015	26 604 158	62 553 247
2009	28 027 777	4 867 282	23 450 655	56 345 714
2010	30 917 461	5 365 749	24 925 722	61 208 932
2011	35 590 198	5 762 497	29 910 805	71 263 500
2012	36 296 786	5 939 705	30 310 311	72 546 802
2013	38 162 334	6 458 179	30 659 312	75 279 825
2014	42 257 806	7 328 175	31 141 844	80 727 825
2015	39 316 506	6 227 145	25 301 665	70 845 316
2016	37 262 021	5 839 379	27 396 466	70 497 866
2017	33 133 500	6 956 797	23 627 567	63 717 864
2018	39 204 938	4 606 085	22 885 832	66 696 855

Source: FAO 2017d; UN Comtrade, 2019

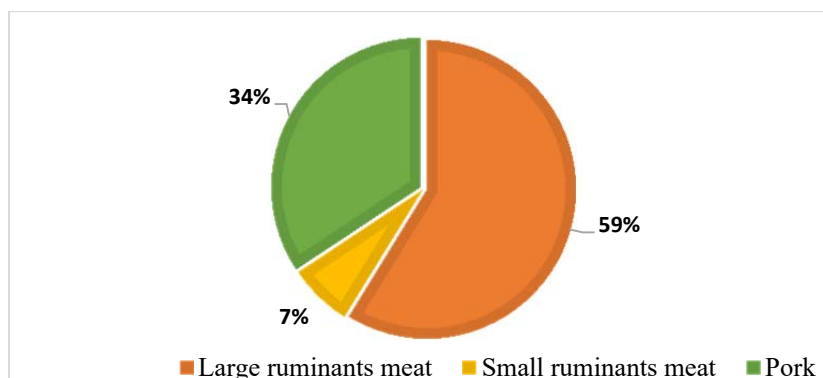


Figure 4.9. Distribution of world red meat export values by animal groups in 2018 (UN Comtrade, 2019)

In 1990, a total of 7 984 911 tons of red meat (large ruminants, small ruminants meat, and pork) were exported worldwide. Among the total exports, large ruminant meat has a share of 54.14% (4 323 345 tons), pork meat 35.48% (2 832 851 tons), and small ruminant meat has a share of 10.38% (828 715 tons).

In 2018, total exports amounted to 18 202 626 tons; with 52.81% (9 611 910 tons) of pork, 43.26% (7 874 355 tons) of the large ruminant, and 3.94% (716 361 tons) of small ruminants (Table 14.21.; Figure 4.10.).

In 2018, red meat exports (large ruminant, small ruminant meat, and pork) increased by 127.96% compared to 1990. While pork exports increased by 239.30% and large ruminant meat exports by 82.14%, exports of small ruminant meat decreased by 13.56% (Table 4.21.).

Table 4.21. Export quantities of large ruminant, small ruminant and pork in the world between 1990 and 2018 (tons)

Years	Red Meat Exports by Animal Groups			Total
	Large ruminants meat	Small ruminants meat	Pork	
1990	4 323 345	828 715	2 832 851	7 984 911
1991	4 902 788	851 034	3 074 229	8 828 051
1992	5 076 503	942 430	3 061 673	9 080 606
1993	4 847 146	873 693	3 228 956	8 949 795
1994	5 093 338	858 394	3 788 873	9 740 605
1995	4 962 293	876 027	3 813 764	9 652 084
1996	4 699 210	872 739	4 062 116	9 634 065
1997	5 106 692	847 937	4 091 351	10 045 980
1998	4 873 779	875 751	4 454 956	10 204 486
1999	5 280 400	904 902	5 245 295	11 430 597
2000	5 269 110	959 176	5 102 732	11 331 018
2001	4 913 090	873 953	5 248 723	11 035 766
2002	5 410 920	865 118	5 806 952	12 082 990
2003	5 652 004	882 291	6 387 449	12 921 744
2004	5 696 969	921 079	7 046 261	13 664 309
2005	6 111 433	1 010 305	7 573 327	14 695 065
2006	6 333 644	1 063 812	7 794 751	15 192 207
2007	6 545 892	1 043 447	8 294 077	15 883 416
2008	6 564 548	1 067 227	9 304 476	16 936 251
2009	6 757 081	1 076 901	9 132 399	16 966 381
2010	6 912 752	1 019 477	9 580 464	17 512 693
2011	6 760 020	877 657	10 348 895	17 986 572
2012	6 798 471	1 034 007	10 498 902	18 331 380
2013	7 186 950	1 207 167	10 362 226	18 756 343
2014	7 657 889	1 273 322	10 468 963	19 400 174
2015	7 729 151	1 206 382	10 897 945	19 833 478
2016	7 653 399	1 162 616	11 613 983	20 429 998
2017	7 026 023	1 202 689	9 466 586	17 695 298
2018	7 874 355	716 361	9 611 910	18 202 626

Source: FAO 2017d; UN Comtrade, 2019

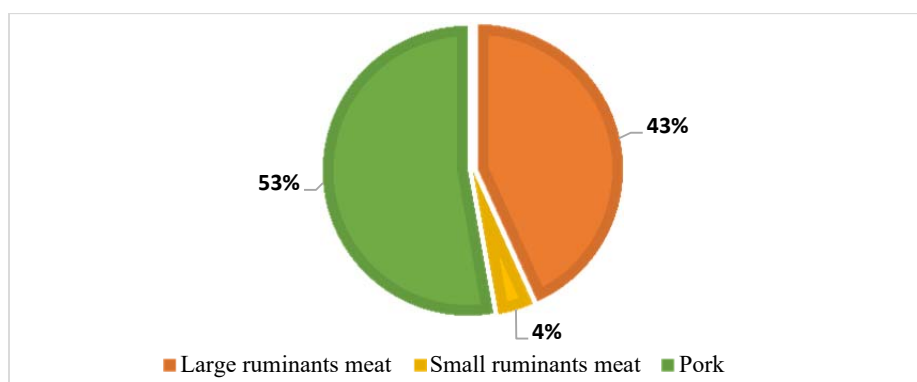


Figure 4.10. Distribution of the world's red meat export amounts by the animal in 2018 (UN Comtrade, 2019)

In 2018, the countries that export large ruminants; in terms of export value, the US ranked first with a share of 8.57% (\$ 7 281 948 000), while Brazil ranked second with a share of 13.92% (\$ 5 458 166 000) and India with a share of 8.62% (\$ 3 380 622 000) ranked third (Figure 4.11.). According to the export quantities, the USA has a share of 12.88%, Brazil has a share of 17.19%, and India has a share of 14.11%.

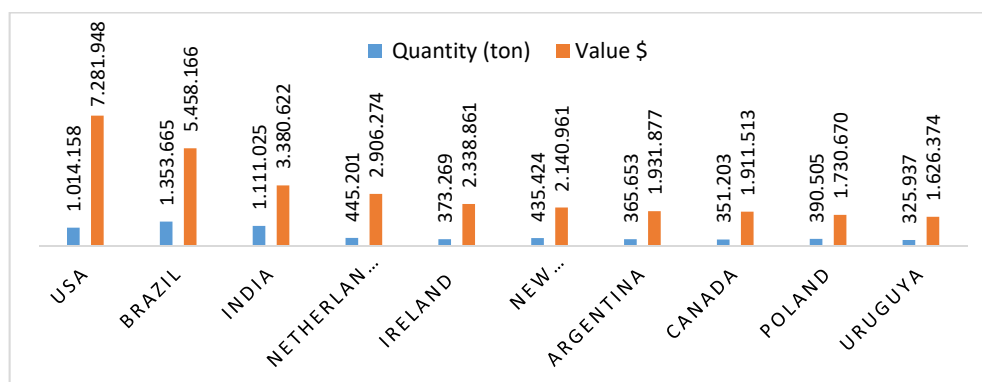


Figure 4.11. Exports (tons) and values of large ruminant red meat by countries in 2018 (thousand US dollars) (UN Comtrade, 2019)

In 2018, among the countries that export small ruminants; in term of export value, New Zealand ranked first with a share of 57.25% (\$ 2 637 087 000), while the UK ranked second with a share of 10.58% (\$ 487 127 000) and Ireland with a share of 7.82% (\$ 360 084 000) ranked third (Figure 4.12.). On the other hand, according to the export quantities, New Zealand has a share of 57.03%, England has a share of 11.54%, and Ireland has a share of 7.42%.

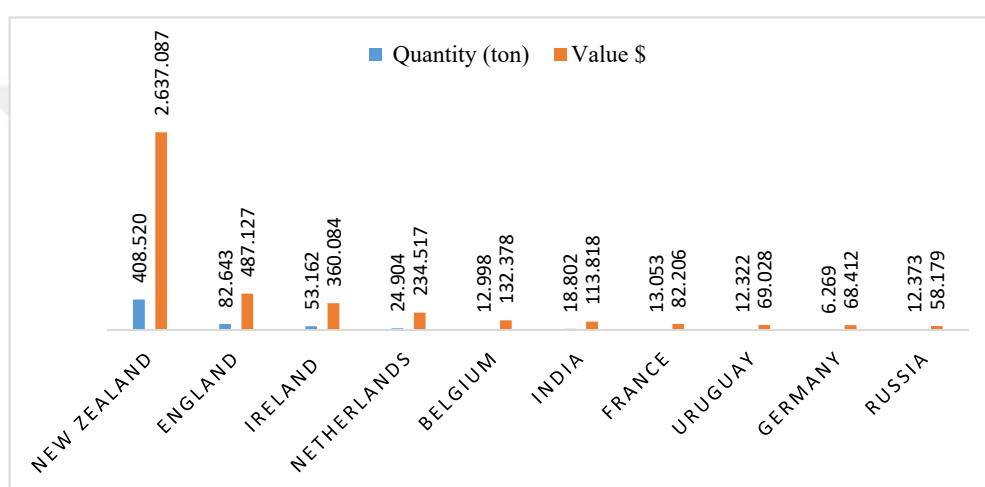


Figure 4.12. Small ruminants export quantities (ton) and values (thousand) by countries in 2018 (UN Comtrade, 2019)

In 2018, from countries exporting pork; based on export value, the United States ranked first with a share of 20.11% (\$ 4601 992 000), while Germany ranked second with a share of 19.30% (\$ 4 416 897 000) and Denmark with a share of 11.41% (\$ 2 612 225 000) ranked third (Figure 4.13.). When it is evaluated according to export quantities, the USA has a share of 18.87%, Germany has a share of 18.63% and Denmark has a share of 11.68%.

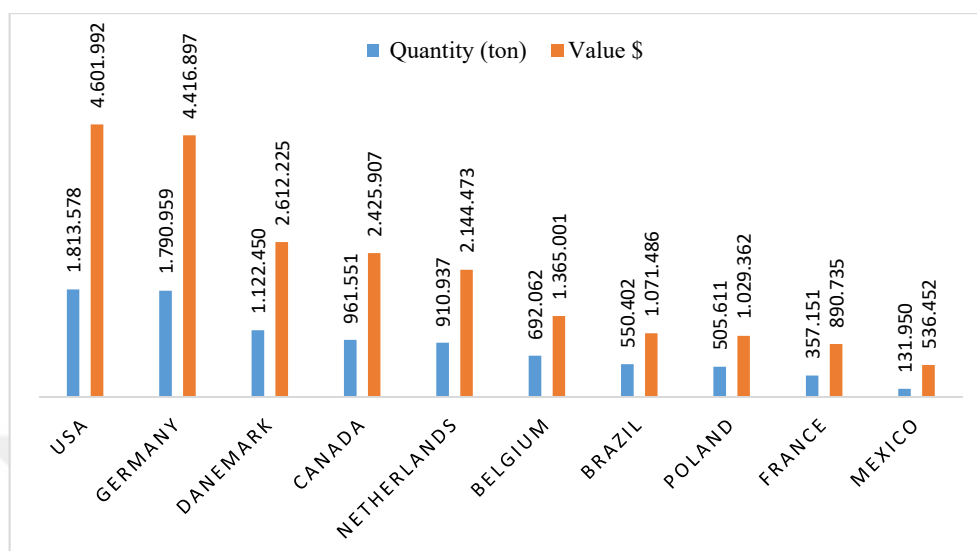


Figure 4.13. Pork export quantity (tons) and values (thousand \$) by country in 2018 (UN Comtrade, 2019)

4.1.2. Meat Sector in Turkey

In Turkey for agricultural production, animal production activities are often held as a side formed from crop production. The most important indicator is the share of agriculture in business enterprises engaged in livestock production in Turkey. Family-type enterprises, which make up a large portion of the animal-producing enterprises, are structural, enterprises that contain a few animals and produce mainly for self-consumption, partly for economic gain.

There are fewer economically producing firms than family-owned firms, and most of the roughage needs are mainly produced in the enterprise, while they rely entirely on external supplies to meet the need for concentrated feeds (Talim and Saner, 1995, Vural & Fidan, 2007, Sevinç, 2018).

As for the geographical location of Turkey, it has great potential in breeding although this potential is not used properly. Although efforts are being made to protect grasslands and pastures, which are essential livestock needs, they

are decreasing (Saygin and Demirbaş, 2017). The livestock sector has declined as a result of flawed policies, resulting in lower livestock production and higher commodity prices (Vural and Fidan, 2007).

In Turkey when we talk about large ruminants' husbandry the first thing that came to mind is cattle and buffalo. Despite the presence of rapidly diminishing buffalo in Turkey, in recent years importance has started to be given to buffalo breeding (Anonymous, 2017 a). The average number of animals in the livestock business in animal production in leading countries in the world is over 200 heads, while the average number of animals per farm in Turkey is 15 heads. According to TURKSTAT data, 83.7% of the large ruminant breeding are under 20 heads. These enterprises are family-owned businesses that produce in traditional ways and operate in other business lines (Çevik, 2018).

Large ruminant husbandry can be carried out in almost every region in Turkey. According to 2017 milk production index (SÜE), dairy cattle farming is highly developed in the province of Konya, which has the largest animal presence, in İzmir, Aydın, Denizli, Balıkesir, Aksaray, Tekirdağ and Niğde provinces respectively. On the other hand, according to the results of 2017 meat production index (EÜE), large ruminants breeding was developed in the provinces of Konya, İzmir, Şanlıurfa, Erzurum, Ankara, Kırşehir, Aydın, Afyon, Sivas, Diyarbakır, Samsun, Balıkesir and Kayseri respectively (Çevik, 2018).

In Turkey in general small ruminants' husbandry is an activity carried out in an extensive way to meet the basic needs of the population, as well as providing employment opportunities to improve the economic (Paksoy and Ozcelik, 2008).

In Turkey, small ruminant husbandry is carried out mostly in an intensive way on the east side of the country. According to TurkStat (TSI) in 2018, the small ruminants data show that Van province has the most presence of small ruminant in Turkey, then Konya, Şanlıurfa, Diyarbakır, Ankara, Mersin, Pain, Siirt, Istanbul, and Balıkesir respectively (TSI, 2018d).

Red meat production in Turkey in early 1990, had a share of 33% of small ruminant meat. In the last years, this share has decreased and in 2018 it reached 10%. The reasons for this can be listed as the increase in large ruminant breeding, intense migration of the people from rural to urban areas, and small ruminant breeding is more troublesome than large ruminant breeding. That is why large ruminant meat production constitutes 90% of the red meat production in 2018.

In Turkey, because of people's religious beliefs, red meat sources are beef, buffaloes, goats, and sheep. In this section, only those types of animals are taken into account.

4.1.2.1. Red meat production

Red meat production in Turkey in 1991 was 466 562 tons. 66.35% (309 563 tons) of beef, 27.57% (128 626 tons) of sheep, 4.19% (19 570 tons) of goat meat, and 1.89% (8 803 tons) of red meat production were buffalo meat. The production in 2018 was 1 118 695 tons; 89.73% (1 003 859 tons) of beef, 9.01% (100 831 tons) of sheep meat, 1.22% (37 525 tons) of goat meat, and 0.04% (402 tons) consists of buffalo meat (Table 4.22.; Figure 4.14.).

Red meat production increased by 139.77% in 2018 compared to 1990. While the share of beef in total production increased, a decrease was observed in the production of buffalo, sheep, and goat meat. In 2018 compared to 1990; beef production increased by 224.28%, buffalo meat production decreased by 95.43%, goat meat by 30.49%, and sheep meat by 21.61% (Table 4.22.).

Table 4.22. Cattle, buffalo, goat and sheep meat production (tons) in Turkey between 1991 and 2018

Years	Meat Production According to Animal Breeds				Total
	Beef	Buffalo meat	Goat meat	Sheep meat	
1991	309563	8803	19570	128626	466562
1992	300652	7967	17286	122887	448792
1993	296066	7131	16166	112806	432169
1994	316654	8162	14908	126306	466030
1995	292447	6094	14124	102115	414780
1996	301828	3140	12274	98127	415369
1997	379541	5640	15592	116104	516877
1998	359273	4762	23429	144703	532167
1999	349681	5196	23693	132476	511046
2000	354636	4047	21395	111139	491217
2001	331589	2295	16138	85661	435683
2002	327629	1630	15454	75828	420541
2003	290455	1709	11487	63006	366657
2004	364999	1950	10301	69715	446965
2005	321681	1577	12390	73743	409391
2006	340705	1774	14133	81899	438511
2007	431963	1988	24136	117524	575611
2008	370619	1334	13752	96738	482443
2009	325286	1005	11675	74633	412599
2010	618584	3387	23060	135687	780718
2011	644906	1615	23318	107076	776915
2012	799344	1736	17430	97334	915844
2013	869292	336	23554	102943	996125
2014	881999	526	26770	98978	1008273
2015	1014926	326	33990	100021	1149263
2016	1059195	351	31011	82485	1173042
2017	987482	1339	37525	100058	1126404
2018	1003859	402	13603	100831	1118695

Source: FAO, 2017b; TURSTAT 2018a

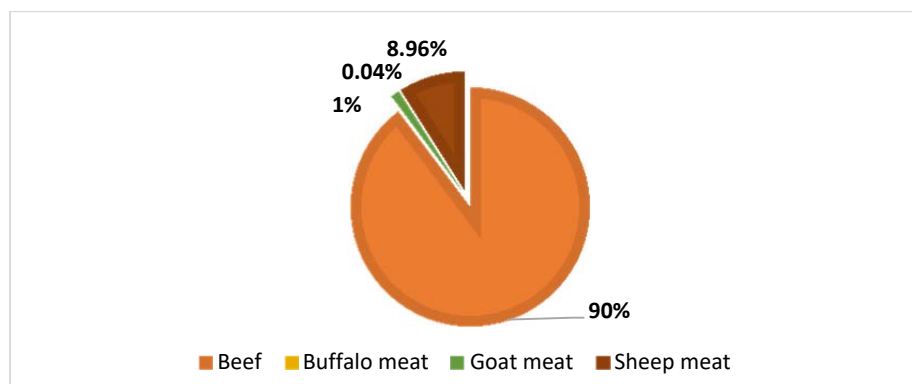


Figure 4.14. Distribution of red meat production in Turkey according to animal species in 2018 (TurkStat, 2018)

When red meat production is examined between 1991 and 2018; while beef production shows an overall increase until 2007, it shows a downward trend in 2008 and 2009 under the influence of the 2008-2012 global economic crisis. In 2010, it started to increase with the support of foreign trade. Beef production, which increased until 2016, decreased in 2017 and increased again in 2018 (Figure 4.15.). The rapid decrease in the presence of buffaloes caused a decrease in buffalo meat production over time. Imports underlie high production in 2010 compared to previous years (Figure 4.15.).

Goat meat production decreased until 1998 but increased in 1998 and 1999, but decreased again in 2000. The increase in small ruminant production in 2007 is also reflected in goat meat. Under the influence of the 2008-2012 global economic crisis, goat meat production, which declined again in 2008-2009, increased again with imports in 2010 and experienced a decline again in 2012. Goat meat production, which started to increase between 2013 and 2017, decreased by 63.75% in 2018 compared to 2017. (Figure 4.15.).

Sheep meat production tended to decline between 1991 and 1996, but increased again between 1997 and 1999 and decreased between 2000 and 2005. Although the increase in sheep meat production started in 2006, a rapid increase in

2007, it decreased again under the influence of the global economic crisis in 2008-2009. It increased by 81.8% in 2010 with the support of imports and followed a fluctuating course between 2011 and 2018 (Figure 4.15.). In general, as a result of the decreasing number of small ruminants and small ruminant production, the production of small ruminant meat decreased, while the production of beef increased.

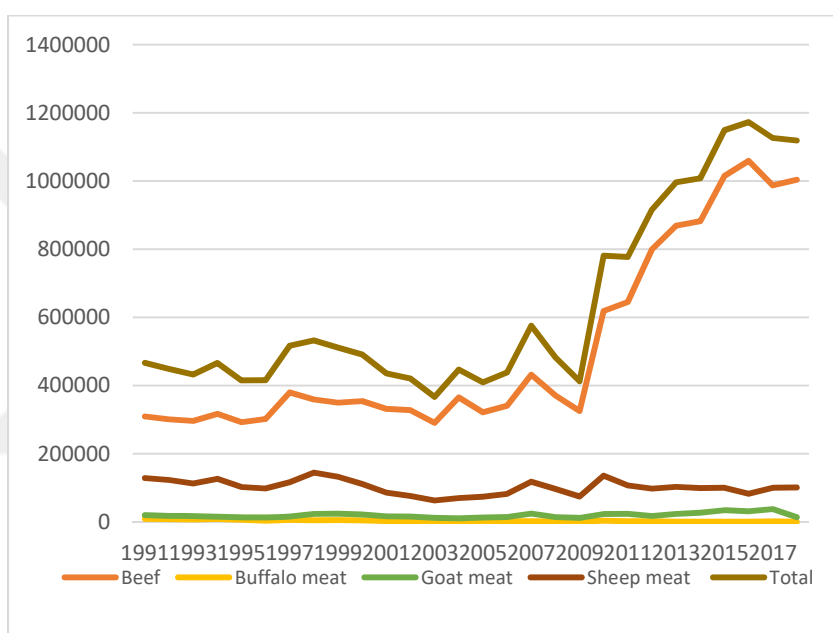


Figure 4.15. Changes in red meat production by animal species between 1991 and 2018 (tons) (TURKSTAT 2018a)

4.1.2.2. Red meat consumption

In 1990, red meat consumption was 744 590 tonnes. 51.26% (381 700 tons) of red meat consumption consists of large ruminants and 48.74% (362 890 tons) of small ruminants, in Turkey. Red meat consumption was 1 620 500 tons in 2018; with 75.83% (1 228 800 tons) of large ruminants and 24.17% (391 700 tons) of small ruminants (Table 4.23.; Figure 4.16.).

Consumption in Turkey of large ruminant meat increased in parallel with an increase in the production, also a decrease in the production of small ruminant meat decrease with the consumption of small ruminants meat. As a result, it is impossible to say that there has had an increase in real terms of red meat consumption.

Red meat consumption increased by 117.64% compared to 1990. In 2018 compared to 1990; large ruminants consumption increased by 212.93% and small ruminants by 7.94% (Table 4.23.). In Turkey, large ruminants consumption increased in the parallel with a rapid increase in production, but the decreased production of small ruminants consumption, as a result, is not possible to say that has an increase in real terms.

Table 4.23. Large ruminant and small ruminant meat consumption in Turkey between 1990 and 2017 (tons)

Years	Red Meat Consumption by Animal Groups		Total
	Large ruminants meat	Small ruminants meat	
1990	381 700	362 890	744 590
1991	373 000	363 520	736 520
1992	337 800	360 270	698 070
1993	334 300	359 370	693 670
1994	311 100	324 560	635 660
1995	309 400	408 500	717 900
1996	323 300	364 840	688 140
1997	385 000	376 100	761 100
1998	363 600	372 190	735 790
1999	354 700	366 640	721 340
2000	358 500	372 990	731 490
2001	331 400	350 540	681 940
2002	328 900	332 490	661 390
2003	301 000	312 000	613 000
2004	375 900	318 010	693 910
2005	327 200	315 050	642 250
2006	346 100	315 150	661 250
2007	431 900	322 920	754 820
2008	375 000	320 160	695 160
2009	322 100	299 600	621 700
2010	613 500	274 600	888 100
2011	632 700	295 400	928 100
2012	779 500	322 070	1 101 570
2013	846 400	351 260	1 197 660
2014	867 300	376 740	1 244 040
2015	1 023 900	378 990	1 402 890
2016	1 101 600	380 990	1 482 590
2017	1 194 000	382 990	1 576 990
2018	1 228 800	391 700	1 620 500

Source: OECD, 2018a

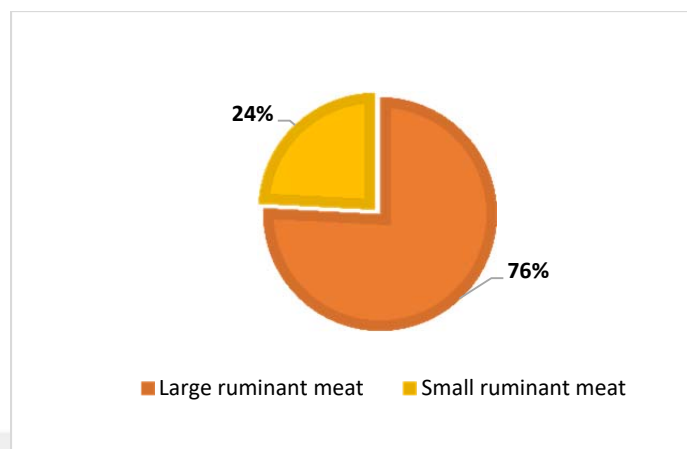


Figure 4.16. Distribution of red meat consumption according to animal groups in Turkey in 2018 (OECD, 2018)

When red meat consumption is examined between 1990 and 2018; it is seen that large ruminant consumption increased only 4 years in the 19 years covering 1990-2008 and decreased in the other 15 years. Large ruminants consumption, which did not show a significant change between 2003 and 2008 period, decreased by 13.17% in 2008 and 25.42% in 2009 due to the effects of the 2008-2012 global economic crisis. In 2010, it started to increase with the support of foreign trade and in 2010 it increased by 90.47% compared to the previous year. The upward trend that started in 2010 continued at a rapid pace until 2018 (Figure 4.17.). Considering the current situation in the production of buffalo meat, it is thought that a very small share of the mentioned consumption consists of buffalo meat, and the predominant part consists of beef. The main reason for the increase in red meat consumption after 2010 is the increase in per capita income.

Small ruminant consumption followed a fluctuating course in the 29 years covering the years 1990-2018 but did not show any real change. Small ruminant consumption, which increased in 1991, decreased between 1992 and 1994 and reached the highest consumption value of the last 29 years in 1995. Between 1996 and 2000, it has increased and decreased. After the decrease in 2001, there was not

much change in the 2002-2008 period. Under the influence of the global economic crisis, the consumption of small ruminant red meat also decreased in 2008 and 2009, and this decline continued in 2010 as well. In this context, it is thought that the effective factor here is the increasing prices and weakening of purchasing power with the 2008-2012 global economic crisis. The increase in small ruminant consumption after 2011 increased only 7.94% in 2018 compared to 1990 (Figure 4.17.). The reason for that increase is the food security decision taken by the government to import red meat in 2010. In general, the change in red meat consumption is parallel to the consumption of large ruminant meat in 2010. The main reason here is the decrease in the supply of small ruminant meat as a result of the decrease in the presence of large ruminants, as well as the increase in the large ruminant supply of ruminant meat as a result of the priority given to large ruminants breeding.

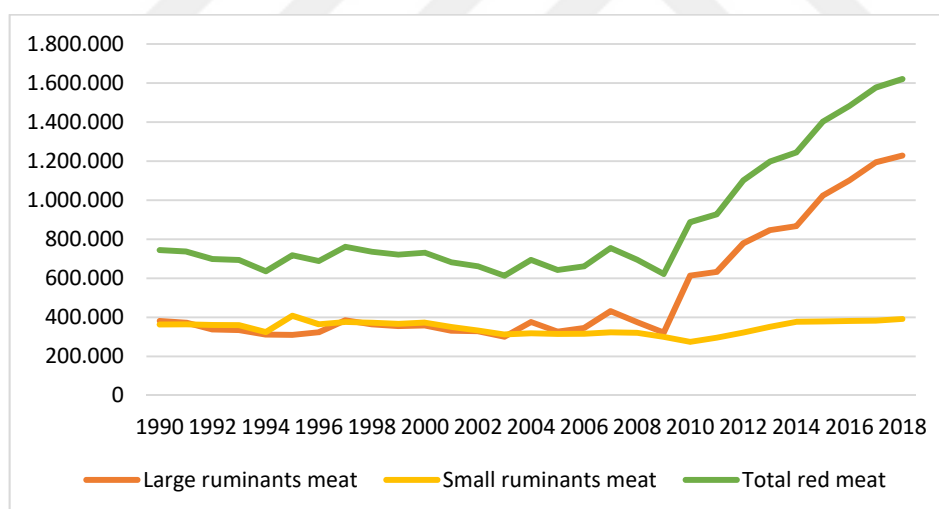


Figure 4.17. Changes in consumption of red meat according to animal groups between 1990 and 2018 (ton) (OECD, 2018a)

In 1990, per capita consumption of red meat in Turkey was 10.88 per kg. 54.46% (5.92 kg) of small ruminants and 45.54% (4.95 kg) of large ruminants were consumed. In 2018, per capita red meat consumption was 14.71 kg; 71.38% (10.50 kg) of large ruminants and 28.62% (4.21 kg) of small ruminants (Table 4.24 .; Figure 4.18.).

Red meat consumption per capita in 2018 increased by 35.33% compared to 1990. Large ruminants consumption increased by 112.12%, while small ruminant consumption decreased by 28.89%. (Table 4.24.). In Turkey, small ruminant consumption per person increased in parallel with the increase of large ruminant production after 2010, and a decrease in the small ruminant production has also a decrease of small ruminant consumption per person. The reason for that increase is the food security decision taken by the government to import red meat in 2010. In Turkey in general, although the increase in small ruminants consumption was 7.94%, per capita consumption decreased by 28.89%.

Table 4.24. In Turkey large ruminant and small ruminant consumption (kg) per person per year between 1990 and 2018

Years	Red Meat Consumption Per Capita According to Animal Groups		Total
	Large ruminants meat	Small ruminants meat	
1990	4.95	5.92	10.88
1991	4.76	5.83	10.60
1992	4.24	5.69	9.93
1993	4.13	5.58	9.72
1994	3.78	4.96	8.75
1995	3.70	6.15	9.85
1996	3.81	5.40	9.21
1997	4.46	5.48	9.94
1998	4.15	5.34	9.49
1999	3.99	5.18	9.17
2000	3.97	5.19	9.16
2001	3.61	4.81	8.42
2002	3.53	4.49	8.02
2003	3.19	4.16	7.35
2004	3.93	4.18	8.11
2005	3.37	4.08	7.46
2006	3.52	4.03	7.57
2007	4.34	4.08	8.43
2008	3.73	4.00	7.73
2009	3.16	3.70	6.86
2010	5.94	3.34	9.29
2011	6.03	3.54	9.57
2012	7.32	3.80	11.12
2013	7.82	4.08	11.91
2014	7.88	4.30	12.21
2015	9.16	4.26	13.50
2016	9.70	4.22	14.02
2017	10.35	4.17	14.59
2018	10.50	4.21	14.71

Source: OECD, 2018a

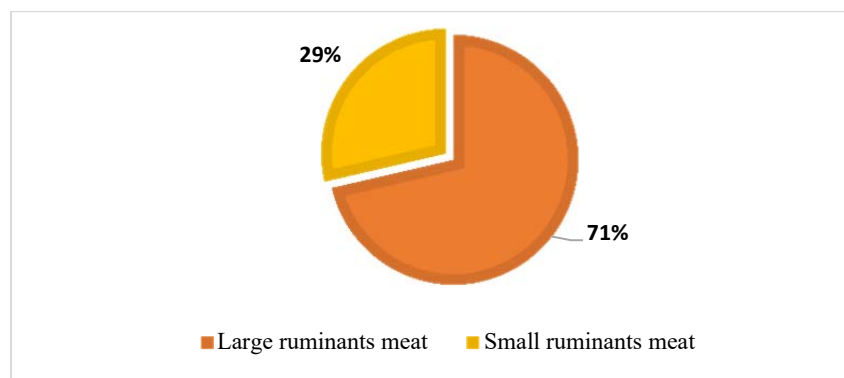


Figure 4.18. Distribution of consumption per person of red meat according to animal groups in Turkey in 2017 (OECD, 2018)

When the consumption of red meat per person was examined between 1990 and 2018; large ruminant meat consumption per capita decreased in the 1990-1995 period and increased again in 1996 and 1997. Consumption, which decreased in the 1998-2003 period, increased by 23.20% in 2004 compared to the previous year. Consumption decreased again in 2005 and increased in 2006 and 2007. As a result of the global economic crisis, it decreased by 14.06% in 2008 compared to 2007 and by 27.19% in 2009. In 2010, they started to increase with the support of imports and in 2010 it increased by 87.97% compared to 2009. The upward trend that started in 2010 continued until 2018 (Figure 4.19.).

Small ruminant consumption per capita increased by less than 2% in 1997, 2000, 2004, 2007 in the 21 years covering 1990-2010, and by 23.99% in 1995 alone, but decreased in the remaining 16 years. Consumption, which started to increase in 2011, decreased in 2015-2017, and increased by less than 1% in 2018 (Figure 4.19.). The change in red meat consumption per capita has been parallel to the consumption of large ruminant meat per capita since 1996. The main reason here is the decrease in the supply of small ruminant meat as a result of the decrease in the presence of small ruminants, as well as the increase in the large ruminant meat supply and the priority given to large ruminants breeding.

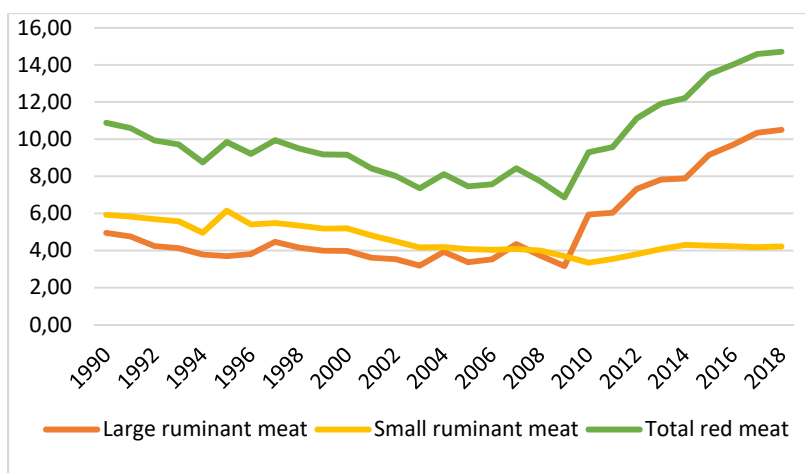


Figure 4.19. Changes in consumption of red meat per capita between 1990 and 2018 by animal groups (kg) (OECD, 2018a)

4.1.2.3. Trade of red Meat

4.1.2.3.(1). Red meat imports

In Turkey in 1990, a total of 9 829 tons of red meat imports worth \$ 13 682 000 was realized. Large ruminants had a share of 99.50% (13 613 000 \$) and small ruminants had a share of 0.50% (\$ 69 000) in the total import value. In 2018, the total red meat imports amounted to 55 753 tons with a value of \$ 260 108 000, all of which consist of large ruminants (Table 4.25.).

In 2018, red meat quantity imports increased by 467.40%, and import value increased by 1801.10% compared to 1990. Small ruminant imports have been realized in only 6 years of the last 29 years and have not been realized since 2002. In the 1997-2009 period, imports of large ruminants were made in small amounts for 3 years, while no imports were made for 9 years. The effects of the import ban, which started in 1997 with mad cow disease, are visible.

Imports of large ruminants started again in 2010 with the release of imports. Imports, which were \$ 249 257 000 in 2010, increased twice by 2011 and reached the highest import value in the last 29 years. In 2014, the value of imports declined to 5 257 000 \$ and realized as 104 916 000 \$ in 2015 and reached its second-highest value in the last 29 years with 260 108 000 \$ in 2018 (Table 4.25.).

Table 4.25. Large ruminant and small ruminants import values (thousand \$) in Turkey between 1990-2018 and quantity (tons)

Years	Red Meat Import Values and Amounts by Animal Groups				Total	
	Groups					
	Large ruminants meat		Small ruminants meat		Value	Quantity
	Value	Quantity	Value	Quantity		
1990	13 613	9 773	69	53	13 682	9 826
1991	31 823	24 934	68	40	31 891	24 974
1992	30 289	29 718	333	228	30 622	29 946
1993	30 884	31 901	-	-	30 884	31 901
1994	9 734	9 218	-	-	9 734	9 218
1995	76 259	45 102	276	177	76 535	45 279
1996	24 666	18 515	106	89	24 772	18 604
1997	395	548	-	-	395	548
1998	-	-	-	-	-	-
1999	1	1	-	-	1	1
2000	14	5	3	4	17	9
2001	-	-	112	202	112	202
2002	5	3	3	1	8	4
2003	-	-	-	-	-	-
2004	74	95	-	-	74	95
2005	-	-	-	-	-	-
2006	-	-	-	-	-	-
2007	-	-	-	-	-	-
2008	-	-	-	-	-	-
2009	-	-	-	-	-	-
2010	249 257	50 658	-	-	249 257	50 658
2011	511 868	110 731	-	-	511 868	110 731
2012	95 992	25 437	-	-	95 992	25 437
2013	24 272	6 141	-	-	24 272	6 141
2014	5 257	640	-	-	5 257	640
2015	104 916	17 574	-	-	104 916	17 574
2016	41 636	5 720	-	-	41 636	5 720
2017	85 282	18 879	-	-	85 282	18 879
2018	260 108	55 753	-	-	260 108	55 753

Source: FAO 2017d; UN Comtrade, 2019

When the period 1990-2018 imports of red meat in Turkey are analyzed; while it is not possible to talk about the presence of small ruminants imports in general, it is possible to mention that imports of red meat contain almost all of the large ruminant meat imports. In 2010, import amounts increased rapidly as a result of the release of imports to reduce red meat prices and the reduction of short-term customs duties from 135-225% to 0-30%. With the decisions taken in 2012, customs duties were increased again and this situation caused imports to fall again in 2013. According to Figure 4.46, the total red meat import curve and the large ruminant red meat import curves overlap (Figure 4.20.).

More reasons for the changes in red meat imports during 1990-2018 are given in section 4.1.2.3.

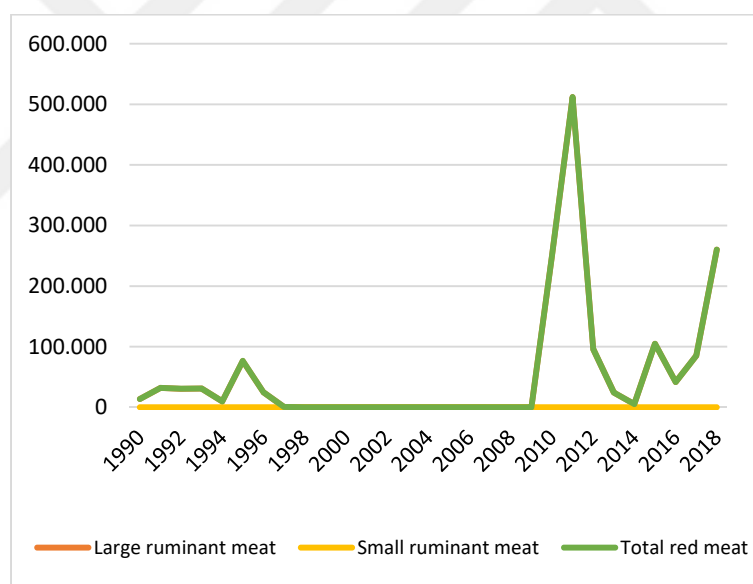


Figure 4.20. Changes of red meat imports by animal groups between 1990-2018 (thousand \$) (FAO 2017d; UN Comtrade, 2019)

Turkey is among the largest per country red meat importer in 2018. While with 176 622 000 \$ and 42 350 tons Poland ranks first, Bosnia and Herzegovina ranked second with an import worth \$45 751 000 worth and 6861 tonnes is located

in import amount. These countries are followed by Serbia, Ukraine, and Hungary respectively (Figure 4.21). Poland accounts for 67.90% of the current large ruminant red meat import value and 17.60% of Bosnia and Herzegovina.

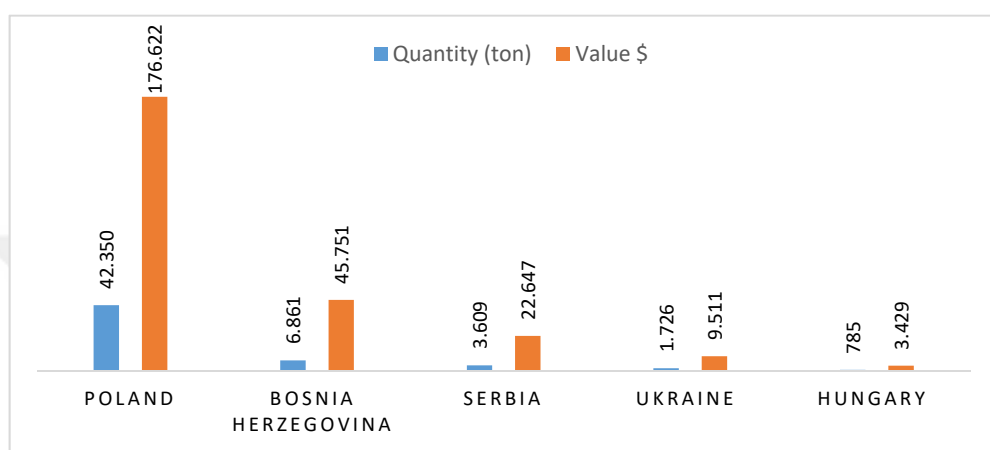


Figure 4.21. Imports (tons) and values (thousand) of the countries where cattle are imported as of 2018 (UN Comtrade, 2019)

4.1.2.3.(2). Red meat exports

Turkey in 1990, a total of 7 460 tons of red meat exports worth \$ 18 317 000 was realized. Small ruminants have a share of 93.53% (\$ 17 132 000) and large ruminants had a share of 6.47% (\$ 1 185 000) in the total export value. In 2018, total red meat exports amounted to 2 227 000 \$ with 157 tons and consisted of 52.36% (1 166 000 \$) small ruminant red meat and 47.64% (1 061 000 \$) large ruminant red meat export (Table 4.22.).

In 2018, the red meat export amount decreased by 97.90% and export value by 87.84%. Small ruminants' export value decreased by 93.19% and large ruminants by 10.46% compared to 1990 (Table 4.26.).

Table 4.26. Large ruminants and small ruminants meat export values (thousand \$) in Turkey between 1990 and 2018 and quantity (tons)

Years	Red Meat Export Values and Quantities by Animal Groups				Total	
	Groups					
	Large ruminants meat		Small ruminants meat		Value	Quantity
	Value	Quantity	Value	Quantity		
1990	1 185	295	17 132	7 165	18 317	7 460
1991	284	44	10 478	3 523	10 762	3 567
1992	1 413	324	16 895	4 962	18 308	5 286
1993	2 845	656	13 098	3 627	15 943	4 283
1994	104	22	21 370	8 436	21 474	8 458
1995	170	36	9 976	2 673	10 146	2 709
1996	382	113	5 721	1 247	6 103	1 360
1997	93	35	7 509	1 903	7 602	1 938
1998	36	13	7 783	1 806	7 819	1 819
1999	159	33	5 776	1 357	5 935	1 390
2000	294	59	4 070	1 018	4 364	1 077
2001	222	54	1 857	658	2 079	712
2002	119	32	43	13	162	45
2003	591	91	30	4	621	95
2004	187	39	23	2	210	41
2005	304	33	195	26	499	59
2006	129	21	101	16	230	37
2007	704	184	269	42	973	226
2008	1 269	267	152	18	1 421	285
2009	605	61	50	5	655	66
2010	841	66	35	3	876	69
2011	638	59	97	5	735	64
2012	845	80	209	14	1 054	94
2013	621	59	218	11	839	70
2014	445	38	53	3	498	41
2015	458	40	399	18	857	58
2016	700	64	1 495	65	2 195	129
2017	467	41	1 405	58	1 872	99
2018	1 061	109	1 166	48	2 227	157

Source: FAO 2017d; UN Comtrade, 2019

Considering the period 1990-2018 red meat exports in Turkey; While in the first half of the 90s it was over \$ 10 000 000, it declined gradually in the following years. Red meat exports decreased to less than \$ 1 000 000 in 2002 and increased again to the level of \$ 2 000 000 in the 2016-2018 period. In the 1990-2001 period, it is possible to say in general the export was only small ruminant meat Figure 4.22.).

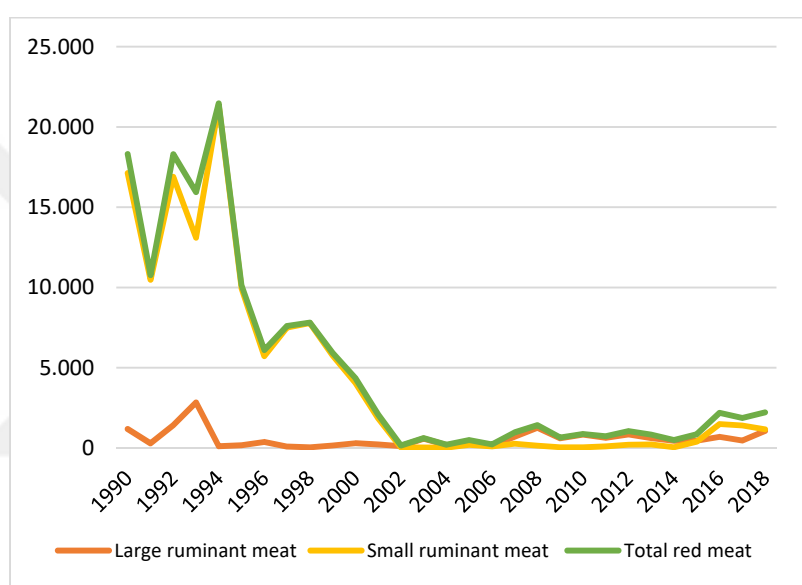


Figure 4.22. Change of red meat export values by animal groups between 1990-2018 (thousand \$) (FAO 2017d; UN Comtrade, 2019)

Turkey is among the countries where large ruminants' exports in 2018. \$ 474 000 value with 53 tons of exports Cyprus while in the first place, with \$ 301 000 and 27 tons of exports the United Arab Emirates is in second place. These countries are followed by Qatar, Iraq, Antigua, and Barbuda respectively (Figure 4.23). Cyprus constitutes 44.67% of the current large ruminant red meat export value and 24.36% of the United Arab Emirates.

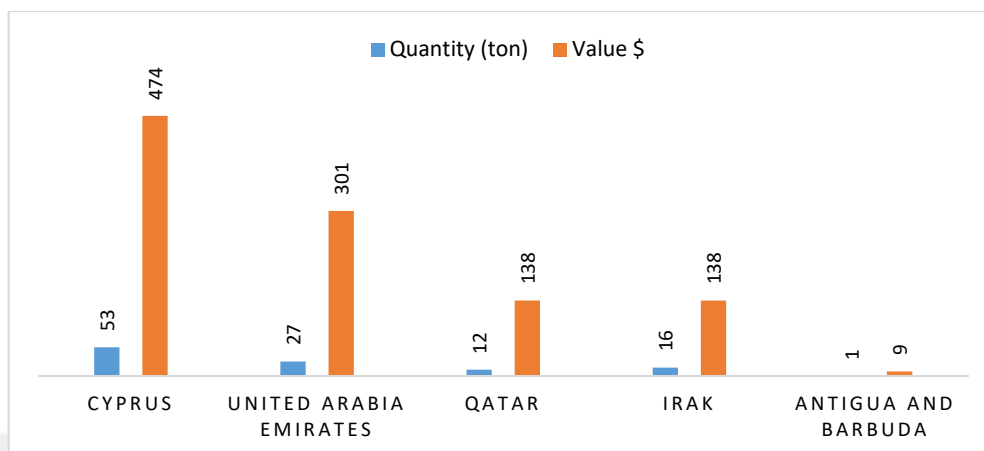


Figure 4.23. Export quantities (tons) and values (thousand \$) of countries where cattle are exported in 2018 (UN Comtrade, 2019)

Turkey is among the countries which in 2018 exported small ruminant meat. With a worth of \$ 524 000 and 22 tons of exports, while the United Arab Emirates is in the first place, Kuwait is in second place with a value of \$ 373 000 and 15 tons of exports. These countries are respectively Oman, Qatar, and Iraq (Figure 4.24). The United Arab Emirates accounts for 44'94% of the current small ruminants export value and Kuwait accounts for 31.99%.

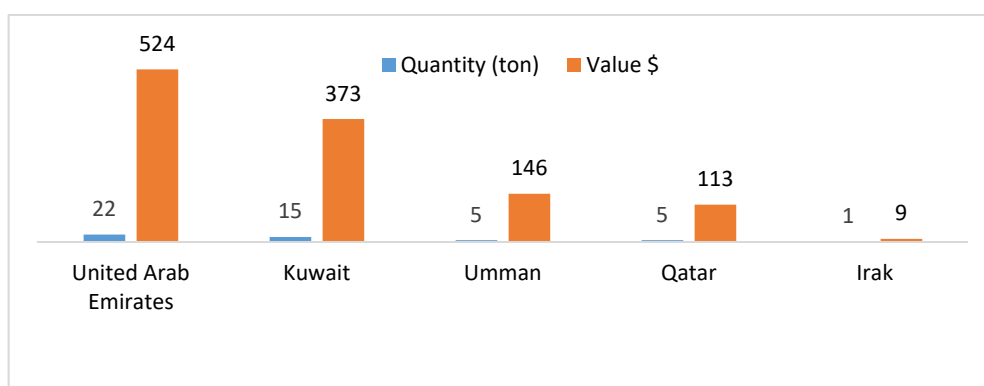


Figure 4.24. Export quantities (tons) and values (thousand thousand) of small ruminant red meat exported countries in 2018 (UN Comtrade, 2019)

4.1.2.4. Livestock, red meat policies and supports

In Turkey, to support livestock improvements new agricultural policy instruments are taken every year, although the country has not reached yet the desired level of husbandry. Throughout history, animal husbandry supports have increased gradually with new additions and revisions. Input subsidies applied in the animal husbandry sector, meat and milk incentives, artificial insemination, support purchases, low-interest credit applications, export incentives, and import restrictions have failed because of insufficient implementation and sustainability (Ikikat Tümer and Birinci, 2011).

The change in animal husbandry after 1980 can be accepted as the turning point of “1980 economic stability measures”. Within the scope of these measures; imports were gradually liberalized, import permits were abolished, customs duties were reduced and animal products were excluded from the scope of support (Yurdakul, 2014). But with the measures and the changes in foreign trade policies, cuts were made above the animal potential of the butchery and the presence of living animals decreased rapidly (Aydın et al., 2011).

Having played an important role in livestock and animal products markets before 1980, YEMSAN, EBK, and SEK lost their influence as a result of the liberalization studies started in 1984 and was included in the scope of privatization in 1992. While YEMSAN was fully privatized in 1994 and SEK was fully privatized in 1995, EBK was partially privatized (Saçlı, 2007). These actions have created an insecure environment in animal product markets for the producer.

In 1998, the Association Council Decision on trade in agricultural products signed with the EU and the IMF a Stand-by Agreement in 1999, and this have been a turning point in terms of animal husbandry in Turkey. The Stand-by Agreement 2000/467 is supporting Animal Husbandry with supportive improvements for the livestock of the country. The decree has been implemented for 5 years since 2000. In 1997, the ban on imports as a result of mad cow disease in the UK prevented the red meat imports committed to the EU in 2005 by the Association Council

Decision (Anonymous, 2001; Sağlı, 2007). Implementation Decree No: 2000/467, which expired in 2005, continued until 2010 with the Decree no. 2005/8503, which contains some differences as a result of the decision of the Council of Ministers (Korkut, 2017).

Starting in 2011; 2011/1430 in 2011, 2012/3106 in 2012, 2013/4463 in 2013, 2014/6091 in 2014, 2015/7495 in 2015, 2016/8791 in 2016, 2017/10465 in 2017, and 2018/11460 in 2018 will be the number of subsidies of decisions the Council of Ministers have been taken regularly every year. These decisions have been prepared with the aim of extending environmentally sensitive agricultural production, increasing the efficiency and quality, ensuring the effectiveness of the policies implemented, contributing to the solution of priority problems of the sector, ensuring sustainability, and keeping the agricultural records up to date and covering the issues related to the agricultural supports to be implemented in the said year (Anonymous, 2012; 2013; 2014; 2015; 2016; 2017b; 2018b).

The planning of the entire country by crop production activities, leaving discarded before sowing the crop area, for the protection of the wastage of manufactured products and the supply-demand balance "Turkey's National Agricultural Support Model" related studies were launched in 2016 by the Agriculture and Forestry Ministry. Within the scope of the model, watershed-based support practices were determined for 21 products including forage crops, and as a result of the decision support system related to these products, the production distribution of 941 watersheds was determined in 2017 and the model was put into practice (Anonymous, 2019a).

As we can see many policies are made to help the production of red meat in Turkey. These policies had impacts on red meat production. In the aim to know consumer's attitudes toward red meat consumption, the particular case of Adana was chosen to make our study.

4.2. Result about fieldwork**4.2.1. General information about consumers and their households**

In this part of our research, we analyze consumer's age, sex, education, profession, and family total member according to their income.

The age average, in general, is 39.75. The average age in the low-income household is 41.68, in average income household it is 38.96 and in the high-income household, it is 39.58 years old (table 4.27.).

Table 4.27. Age Average of consumers (year old)

	Lower-income	Average-income	High-income	Total
Average of consumer's Age	41.04	38,96	39,58	39,75

In this research, the male consumer is about 60.0 % and the female consumer is about 40.0% (table 4.28.). The survey was conducted with those who decided or participated in the purchase of red meat in the household. In other words, no survey was conducted with people who did not have any knowledge about the purchase of red meat in the household and who did not have any decision about it.

It has been determined that the people who make decisions regarding the purchase of red meat in households are mostly male. This value is 52.5% in low-income households, 60.5% in average-income households, and 67.8% in high-income households.

Table 4. 28. Gender distribution of consumer %

	Lower-income	Average-income	High-income	Total
Male	52.5	60.5	67.8	60.0
Female	47.5	39.5	32.2	40.0
Total	100.0	100.0	100.0	100.0

In Table 4.29 we have information about consumer education. 22% of consumers went to primary school, 10.2% middle school, 40% High school, 9.5% Associate degree, and 18% went to university.

Education level varies according to income groups. While 30.5% of the low-income group surveyed were primary school graduates, this ratio was 4.3% in the high-income group. Similarly, the proportion of those with a university degree is 8.5% in the low-income group and 40.9% in the high-income group (table 4.29).

Table 4.29. Education of consumers (%)

	Low income	Average income	High income	General
Illiterate	0.8	0.0	0.0	0.2
Primary school	30.5	28.1	4.3	22.0
Middle school	9.3	9.6	12.2	10.2
High school	41.5	45.5	30.4	40.0
Associate degree	9.3	7.8	12.2	9.5
University	8.5	9.0	40.9	18.0
Total	100.0	100.0	100.0	100.0

Firstly 20% of consumers are officers, 31 % workers, 9.5 % retired (Table 4.30.). On the other hand, 19% are housewives, 12% Artisan, 4% freelance, 3.2 % jobless, and 1.2 % of farmers. The distribution of professional groups of consumers differs according to income groups.

While 41.7% of those in the high-income group were Officers, this proportion was 15% and the low-income group was 5.9%.

While Officers were 41.7% in the high-income group, this proportion was 15% in the average income group and 5.9% in the low-income group.

For Workers in low income, it is 31.4% while in the average income group it is 41.9 % and in the high-income group, it is 14.8 %. The rate of retirees decreases as the income group rises.

Table 4.30. Profession distribution of consumers (%)

	Low income	Average income	High income	General?***
Worker	31.4	41.9	14.8	31.0
Officer	5.9	15.0	41.7	20.0
House wife	31.4	16.8	9.6	19.0
Artisan	5.1	14.1	15.7	12.0
Retired	16.1	7	6.6	9.5
Freelance	1.7	2.4	8.7	4.0
farmer	1.7	1.8	0.4	1.2
Jobless	6.8	1.2	2.6	3.2
Total	100.0	100.0	100.0	100.0

The average number of people living by households in the study area was determined as 3.07 person (table 4.31.). There is 3.07 person in the low-income group, 3.10 person in the average-income group, and 3.04 person in the high-income group. 50.94% of the population in the households are male and 49.06% are female.

In this research, red meat consumers and no-meat consumers are important. But in this research, from the people who answer the questions, we did not find any household who do not consume red meat.

Table 4.31 Gender distribution in households and the number of individuals

	Lower-income		Average-income		High-income		General	
	Number	%	Number	%	Number	%	Number	%
number of individuals	3.07	100.00	3.10	100.00	3.04	100.00	3.07	100.00
number of men	1.49	48.54	1.57	50.64	1.63	53.62	1.56	50.94
number of women	1.58	51.46	1.53	49.36	1.41	46.38	1.51	49.06

In the research conducted, the average income of the households was determined as 3 887.75 TL per month (Table 4.32.). The average monthly income of households in the low-income group is 2 172.03 TL, the average monthly income of the households in the middle-income group is 3 379.64 TL and the average monthly income of the households in the higher- income group is 6 386.09 TL.

The food expenditure of households is shown in Table 4.3. It has been determined that the amount of food expenditures increases as the income level rises, and the corresponding ratio decreases. In general, food expenditure is 29.16% of the average household income.

Table 4.32. Income and food expenditure of households

	Lower-income		Average income		Higher-income		Total	
	TL/month	%	TL/month	%	TL/month	%	TL/month	%
Income	2172.03	100	3379.64	100	6386.09	100	3887.75	100.0
Spending on food	711.55	32.76	912.50	27.00	1596.52	25.00	988.12	29.16

4.2.2. Information on households red meat consumption

In this study, the average annual red meat consumption by households was determined as 67.88 kg (Table 4.33.). There are significant differences in the annual meat consumption of households by income groups. While the annual meat consumption is 42.35 kg in the low-income group, it is 50.71 kg in the average income group and 110.6 kg in the high-income group. Red meat consumption of households in Adana is based on small ruminant meat.

Red meat consumption increased as the income of the households examined increased.

Table 4.33. Meat consumption of households (kg/year)

kg/year	Lower-income consumption	Average-income consumption	High-income consumption	average
Large Ruminant	3.30	4.81	8.76	5.62
Small Ruminant	32.24	37.47	95.32	55.01
Processed Meat	5.49	7.83	4.75	6.02
Sacrifice	1.32	0.6	1.77	1.23
Total red Meat	42.35	50.71	110.6	67.88

One of the most important factors affecting meat consumption is the number of individuals in the household. In this study, the average number of individuals in households was determined as 3.07. Throughout the region in general, everybody consumes red meat. We found out annual meat consumption per capita is 22.05 kg in Adana. This ratio is 13.77 kg in the low-income group, 16.15 kg in the middle-income group, and 36.03 kg in the high-income group (Table 4.34).

Table 4.34. Red meat consumption per capita (kg/year)

kg/year	Lower-income consumption	Average-income consumption	High-income consumption	Total average
Large Ruminant	1.07	1.55	2.85	1.82
Small Ruminant	10.50	12.08	31.05	17.88
Processed Meat	1.78	2.52	1.55	1.95
Sacrifice	0.42	0.19	0.58	0.40
Total red Meat	13.77	16.15	36.03	22.05
Khi-square analysis results	Khi square value (X^2)		P-value	
	59.122		0.042	

In Turkey, studies made in different times, and different regions show information relating to red meat consumption. In a study in 2019 Merve Ayyildiz found out in Tokat the annual red meat consumption per capita was 26.34 kg (Merve AYYILDIZ, 2017). Also, in a survey conducted in urban areas of Erzurum in 2013, it was determined that the annual red meat consumption per household was 59.76 kg and the consumption per person was 14.16 kg (Kiziloglu and Kiziloglu, 2013). In a research conducted in Isparta in 2007, red meat consumption per person was determined as 7.20 kg (Hatirli et al., 2007). In another study conducted in Urfa in the same year, the annual red meat consumption of the households was 70.32 kg (Karli and Bilgiç, 2007). In a study conducted in Izmir in 2010, it was concluded that the consumption of beef per person per year was 7.93 kg (Cankurt et al., 2010). In a study conducted in Van in 2006, the total red meat consumption of households was determined as 71.23 kg (Ceylan, 2006). Also, in a study conduct in Adana in 2007 by Seval MUTLU red meat consumption was 19.68 kg per year per capita.

On the other hand, a Chi-square analysis showed that there was a difference between income and red meat consumption. Accordingly, it was found that high-income households consumed red meat above the average, and medium-income households consumed red meat below the average.

Another factor that is effective on the amount of red meat consumption, as well as the income level, is the education level. Table 4.35. contains information about the relationship between education and red meat consumption. According to the chi-square analysis, the amount of red meat consumption of consumers varies according to their education levels. It has been determined that a consumer with an education level of Associate degree and above prefers red meat over the average (22.05). There was a significant relationship between the amount of red meat consumption and the level of education a 5% significance level. Based on these findings, it is concluded that the amount of red meat consumption increases as the education level of the consumer increases.

Table 4.35 Relationship between education level and consumption

	Primary school and under	Middle school and high school	Associate degree and above	Total average
$\mu>$	35.6	20.2	27.9	25.5
$\mu<$	64.4	79.8	72.1	74.5
Total	100.0	100.0	100.0	100.0
Khi-square analysis results	Khi square value (X^2)		P-value	
	7.251		0.027	

Consumers' red meat and meat products purchasing frequency by income were examined (Figure 4.25). The graph shows that in the high-income group people consume red meat at least once or three times a week. For the low- and average-income groups it is mostly once a month or between three and five times a month.

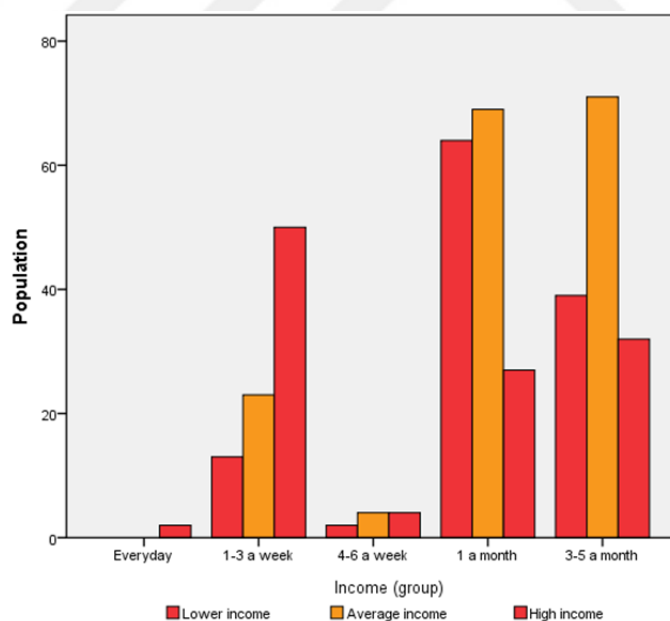


Figure 4.25. Average purchase frequency of consumers' red meat and meat products

On the other hand, consumers' preferences of types of red meat and meat products purchased income were examined and the graph (Figure 4.26) was made. The graph shows that no matter the income group consumer prefers boneless meat.

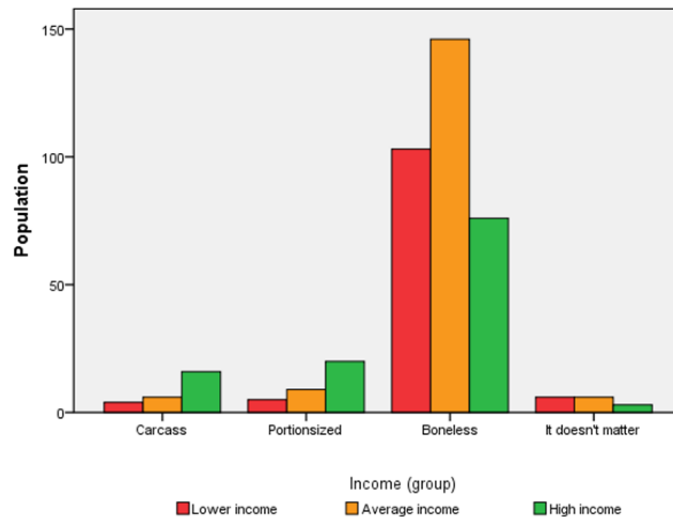


Figure 4.26. Red meat-type preferred by income group

4.2.3. Reasons of changes in red meat consumption in households compared to previous years

Meat consumption plays an important role in human nutrition and household food expenditure. Red meat prices in the long-term have fluctuation. Also, it is possible to experience increases and decreases in household's income over time. It can be said that red meat prices and household income have a significant impact on red meat consumption. From this point of view, it is important to know what kind of change has occurred in the consumption of households in recent years. Information is given in Table 4.36. While 90% of households stated that there was a change in red meat amount, increased (13.8%), or decreased (76.2%) in recent years, 10% stated that there was no change. The change in red meat consumption meat has a difference significative. Red meat

consumption decreased by 83.1% in the lower income group, by 79% in the middle-income group, and 65.2% in the high-income group. On the other hand, in the high-income group, 27% of households reported an increase in red meat consumption in the years while this ratio was 4.2% in the low-income group and 11.4% in the middle-income group.

In the last years, the percentage of households who stated that there was no change in the amount of red meat consumption was 12.7% in the low-income group, 9.6% in the middle-income group, and 7.8% in the high-income group.

According to the chi-square analysis, the change in the amount of meat consumption in households varies according to income groups. According to the level of households, in the high income and middle-income groups, a significant relationship was found between the change in red meat consumption and income at the level of 1% significance.

Table 4.36. Change in the amount of red meat consumption compared to previous years (%)

Years (%)		Low income	Average income	High income	General
Increase	%	4.2	11.4	27.0	13.8
No change		12.7	9.6	7.8	10.0
Decrease		83.1	79.0	65.2	76.2
Chi-square analysis		Chi square value (X ²)		P-value	
		27.200		0.000	

The reasons for the increase or decrease in the amount of consumption are given in Table 4.37 and Table 4.38. The most important reason for those who stated that red meat consumption has decreased in recent years is price increases (57.4%). This was followed by the lack of income with 29.4%, health problems with 7.1%, and the lack of hygiene and reliability with 6.1 %. The above rates show significant changes according to income groups. Among the reasons for the

decrease in red meat consumption, the price increase was 46.9% in the low-income group and higher in the middle-income group (59.7%). In the high-income group, it is 68.4%. In normal conditions, the main reason for the decrease is expected to be a price increase. However, the situation is different according to income groups. In the low-income group, in addition to price increases, income insufficiency was also shown as an important reason (43.4%). However, in the high-income group, hygiene-related issues (10.1%) are the most important after the increase in price and lack of income. But in the middle-income group, the most important is health-related (10.4) issues after price increases (59.7%) and lack of revenue (23.9%).

Table 4.37. Reasons for the decrease in red meat consumption in households compared to previous years (%)

		Low income	Average income	High income	General
Price increases	%	46.9	59.7	68.4	57.4
Lack of income		43.4	23.9	19.0	29.4
Health problems		6.2	10.4	2.5	7.1
Lack of hygiene and reliability		3.5	6.0	10.1	6.1

Of the 400 households surveyed, 55 (13.8%) reported an increase in red meat consumption in recent years. Since the number of variables was low, no need to analyze according to income groups. Table 4.38 data in general evaluation; Among the most important reasons of the households which stated that red meat consumption increased in recent years, red meat is beneficial for health (52.1%), income increase of households (39.4%), decrease in meat prices (4.2%), red meat quality increase (4.2%).).

Table 4.38. Reasons for the increase in red meat consumption in households compared to previous years (%)

	Low income	Average income	High income	General
Decrease of red meat price	0.0	0.0	11.1	4.2
Increase in income	25.0	25.0	63.0	39.4
Increased meat quality	0.0	3.1	7.4	4.2
Finding beneficial for health	75.0	71.9	18.5	52.1

4.2.4. Consumers' red meat shopping place preferences and reasons

In Table 4.39 the only butcher, the market, and the rates of both shoppers are given. 60.5% of consumers stated that they shop only from the butcher shop. Although there is no significant difference between the income groups, the ratio of the shoppers from the butcher shop is higher in the low-income group. The rate of those who prefer only the market is 22% and the percentage of those who prefer only the market is high in the high-income group. The rate of shopping for both of them is 14.2% and there is no significant difference between income groups. In the research, the ratio of those who prefer both butchers and grocery stores, and also the rate of those who cut or cut themselves, and the proportion of those receiving help were determined as 3.2 % and this rate was higher in low-income households.

Table 4.39. Distribution of those who prefer only butcher, market or both (%).

	Low income	Average income	High income	General
Butcher	63.6	56.3	63.5	60.5
Markets	22.0	25.1	17.4	22.0
Both the butcher and the market	11.0	15.6	15.7	14.2
Others (butcher, market, Self-cutting or cutting, etc)	3.4	3.0	3.5	3.2

The relationship between red meat purchase preference and education was investigated and Table 4.40 was created. It was determined that there was a significant relationship between the red meat purchase place and the education level. The proportion of those who only shop from the butcher decreases as the level of education increases. While 63% of primary school and under consumers prefer the only butcher, this rate is 55.6% for high-school consumers. As the level of education increases, the ratio of those who prefer only the market increases. While only 7.4% of primary and lower school consumers preferred the market, 37.1% of the consumers who had education at the university level stated that they shop at the market. It is seen that there is no significant difference between the ratio of those who prefer both a butcher shop and market and education levels. It was determined that the ratio of those who prefer both butcher shop and grocery store, and the ratio of those who cut themselves and those who received aid was higher in consumers with low educational level (14.1%). This rate is 3.1% for those with higher education.

Table 4.40. Relationships between educational level and red meat purchase place (%)

	Primary school and under	Middle school and high school	Associate degree and above	Total average
Butcher	63.0	55.6	46.7	55.1
Markets	7.4	23.2	37.1	22.5
Both the butcher and the market	15.1	18.2	13.2	15.5
Others (butcher, market, Self-cutting or cutting, etc)	14.1	3.0	3.1	6.9

There are many reasons why consumers prefer a butcher shop or a grocery store. Table 4.41, detailed information about these reasons. The opinions of consumers about purchasing place preferences were evaluated by a Likert scale.

To determine the place of purchase, the fact that the meat is fresh in the place has been determined as the most important factor that consumers take into consideration (96.6%). It can be stated that there is no significant difference between income groups. At the same time, the average score was high in each group and 3.41 in the overall average.

72% of consumers care about red meat prices being more affordable at the sale place. There is no significant difference between income groups. The average score was 3.18, 3.2, and 2.89, respectively.

In the preference of red meat purchase place, the rate of those who did not care that the owner of the place purchased was familiar is 42.1%. In today's conditions, red meat is considered to have an important rate in butchery as well as in grocery stores. In the choice of red meat buying place, the consumer must recognize the owner of the place due to the widespread butcher culture in the past, this culture continues despite the development and settlement of the market phenomenon. Taking into account the working area, red meat is often preferred

when the butchers are known to be familiar that is why 57.9% said it was important. It is determined that there is no significant difference in purchasing place preference concerning income groups.

It can be said that it is important that the place of purchase is close to consumers' homes or workplaces. The rate of those who think this issue is significant is 58.7%. And 41.3% of consumers don't care that the red meat selling place is close to home or workplace. The average score for purchasing place preference was determined as 2.71. This value is below the average of 3 points so consumers do not care about the proximity of the butcher or grocery store to their home or workplace according to income groups.

Consumers who give importance to the place of buying red meat by habits was 72.4%. There is no significant difference between income groups. The average score was 2.80, 2.87 and 2.89 respectively.

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Table 4.41. Factors determining red meat buying place

	Degree of importance		Low income		Average income		High income		General	
Because it's fresher	Strongly not important	%	1.8	5.4	0.0	2.5	0.0	2.9	0.5	3.4
	Not important		3.6		2.5		2.9		2.9	
	Important		50.0	94.6	49.7	97.5	55.8	97.1	51.6	96.6
	Very important		44.6		47.8		41.3		45.0	
	Average		3.37		3.45		3.38		3.41	
Because prices are more affordable	Strongly not important	%	1.8	20.6	0.6	18.4	2.0	32.4	1.3	22.9
	Not important		18.8		17.8		30.4		21.6	
	Important		39.3	79.4	41.4	81.6	44.1	67.6	41.5	77.1
	Very important		40.1		40.2		23.5		35.6	
	Average		3.18		3.21		2.89		3.11	
Because the butcher is familiar	Strongly not important	%	12.5	41.1	8.9	42.0	11.5	43.2	10.7	42.1
	Not important		28.6		33.1		31.7		31.4	
	Important		30.3	58.9	30.6	58.0	35.6	56.8	31.9	57.9
	Very important		27.6		27.4		21.2		26.0	
	Average		2.75		2.76		2.66		2.73	
Being close	Strongly not important	%	8.9	41.0	1.9	39.5	7.7	44.2	5.6	41.3
	Not important		32.1		37.6		36.5		35.7	
	Important		35.7	59.0	44.6	60.5	42.3	55.8	41.3	58.7
	Very important		23.3		15.9		13.5		17.4	
	Average		2.73		2.75		2.62		2.71	
Habit	Strongly not important	%	8.9	33.0	2.5	28.6	3.9	20.4	4.8	27.6
	Not important		24.1		26.1		16.5		22.8	
	Important		44.6	67.0	53.5	71.4	66.0	79.6	54.3	72.4
	Very important		22.4		17.9		13.6		18.0	
	Average		2.80		2.87		2.89		2.85	

In this study, the binary logit regression model, which is one of the limited dependent variable models, was used to determine the probability of consumers who prefer to buy red meat on the market or not and also to determine the factors affecting these possibilities.

Six variables were found to be statistically significant in a single variable model trial for a total of eight independent variables (Table 4.42). These variables are; income, education, amount, proximity, fresh meat, affordable price. All statistically significant variables were tested with multiple models and only four variables (education, amount of meat, being close, being fresh) were found to be statistically significant due to the effect of the final modeled variables on each other. Finally, the logit model;

Preference place = $\beta_0 + \beta_1 \text{education} + \beta_2 \text{meat amount} + \beta_3 \text{Being close} + \beta_4 \text{Fresh}$ formed and given in table 4.42.

The likelihood ratio (Loglikelihood: 354.823) and the Goodness of fit of multiple models were found to be sufficient with R^2 value (Cox&Snell R^2 : 24%; Nagelkerke R^2 : 34%).

Table 4.42. Defining variables

Variables	Definition
<i>The dependent variable</i>	
Place of purchase (preferred place)	0 = not market, 1 = market
<i>Independent variables</i>	
Revenue (revenue)	Average monthly income of the consumer
Education	1 = primary school and below 2 = middle school and high school 3 = Associate degree and university
Amount of red meat (quantity)	Amount of red meat per capita kg/year
Being close	1 = not important 2 = neither important nor not 3 = important
Fresher at the place of purchase	1 = not important 2 = neither important nor not 3 = important
Because prices are more affordable	1 = not important 2 = neither important nor not 3 = important

When buying red meat, it was a question of revealing the possibility for consumers to prefer the market or not. In the dependent variable, those outside the market (0) are determined as the reference category. This indicates that consumers may prefer to buy red meat outside the market. The results of the binary logit model are given in Table 4.43.

Education can be seen as an important factor for consumers to choose whether to buy red meat in a market or not.

The relationship between the level of education and the possibility for individuals or households to prefer red meat when buying meat was found to be statistically significant at the 5% level. Consequently, as the level of education increases, the probability that consumers choose the market instead of those outside the market increases by 2.28 times (Table 4.43).

The amount of red meat being consumed is influential on the consumers' choice of place of purchase. The meat quantity variable is statistically significant at the level of 5% in the purchase place preference. The coefficient of the meat amount was negative. In this context, as the amount of red meat consumed decreases, it is seen that the probability of people choosing the market instead of those other than the market increases by 0.98 times (Table 4.43).

The freshness of the meat is a very important factor in the consumer's choice to choose the market or not at the level of 1%. As the freshness of the meat increases the probability of preferring the market increase by 1.35.

The closeness of shopping is an important factor at a 5% level for consumers to choose red meat buying places. As the closeness of the shopping increases, the probability of preferring the market to those other than the market is 1.56 higher.

Table 4.43 Binary logit model results

Variables	Coefficient	S.E	Wald	df	Significance level (P)	Exp (Coefficient)
Education	0.251	0.218	1.327	1	0.024	2.286
Red meat quantity	-0.018	0.14	1.508	1	0.022	0.982
Freshner	-1.029	0.253	16.549	1	0.000	1.358
Being close	0.495	0.178	7.690	1	0.006	1.563
C (constant)	2.004	1.020	13.859	1	0.000	7.422
Loglikelihood: 300.477 Cox&SnellR ² : 0.072 NagelkerkeR ² : 0.122						

4.2.5. Consideration of some important factors in red meat consumption

Some of the factors that consumers appreciate in red meat consumption are given in table 4.44. These can be classified as red meat price and quality, characteristics of the slaughtered animal, services offered by the place of sale.

The family member's preferences are an important factor for consumers. 91.8% state that they consider the household preference before they purchase red meat. The average score is also high at 4.30. Although there is no significant difference between income groups, the more the income increases more they care about the family preference.

Evaluation of competition and food control studies under today's conditions show that meat price is an important factor for consumers. 83% of consumers stated that the price was important for meat consumption. This rate is much higher in the low-income group (87.3%). When the average score of the price are analyzed, it is seen that it is generally 4.22 and 4.35 in the low-income group.

Although in general, it is important to know the origin of the animals (in which region they were raised), it is not the case for consumers to have this information. Only 34% of consumers stated that they care about this issue. It is

observed that as the income level rises, the rate related increases too. The average score for this issue was 3.03.

In this study, the size of the packaging was found to be not important. 78.8 do not care about the size of the packaging. The average score was quite low at 2.08.

93.5% of consumers stated that they care about the way the animal was cut. It is observed that there is no significant difference in income groups. The average score value for this was determined at 4.30. That can be easily explained by the fact that religion is Islam.

It has been determined that consumers highly (98.5%) care about the expiration date. The average score is 4.30 and there is no significant difference between income groups.

One of the most important factors that consumers care about in the process of consumption is hygiene conditions. Hygiene is an important element for consumers in the process from production to sales. In the study, it is seen that 97.2% of consumers care about hygiene conditions. Although there is no significant difference between income groups, it is determined that the overall average score is very high (4.40).

Consumers highly (97.2%) appreciate the quality of the meat whether the meat is fresh or not by observing the physical appearance of the meat. Although there is no data for those who prefer fat or lean meat, it is known that consumers' preferences generally non-fat meat. Considering to buy meat at the prices in the market, it is expected that consumers will prefer to consume better quality meat for the price they pay. The average score is determined as 4.23 and it is seen that there is no significant difference between income groups.

It was determined that the origins of the animals, as well as the feeding style (pasture or stable), are important. 89.5% of consumers stated that they care about the feeding of the animals. The average score for this is 3.18. It is observed that there is no significant difference between income groups. In the observations

made during the survey study, it has been determined that when the animals grazed on the pasture the consumers have a broad belief that the meat is healthier and more delicious. On the contrary, it is believed that the meat quality of the animals that are grown in the herd and do not go to the pasture is low.

The fact that red meat was recommended by experts (butcher or department representative) does not have a very important effect on consumers. The rate of those who care that experts recommended the meat is 49%. And more the income increase less they care. The average score is 3.30 and there is no significant difference between income groups.

Table 4.44. Consideration of some factors in the red meat consumption process

	Degree of importance		Low income		Average income		High income		General	
Family members' preferences	Strongly not important	%	0.0	4.2	0.0	1.2	0.9	3.5	0.2	2.7
	Not important		4.2		1.2		2.6		2.5	
	Neither important nor not important		7.6		6.0		2.6		5.5	
	Important		44.9	88.1	46.1	92.7	63.5	93.9	50.8	91.8
	Very important		43.2		46.7		30.4		41.0	
	Average		4.27		4.38		4.20		4.30	
	Price	Strongly not important	%	0.0	0.8	0.0	1.2	0.9	8.7	0.2
Not important		0.8		1.2		7.8		3.0		
Neither important nor not important		11.9		12.0		18.3		13.8		
Important		39.0		87.3	37.1	86.8	45.2	73.0	40.0	83.0
Very important		48.3			49.7		27.8		43.0	
Average		4.35		4.35		3.91		4.22		

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In which region the animal is raised	Strongly not important	%	6.8	34.8	4.2	35.9	4.3	26.0	5.0	32.8
	Not important		28.0		31.7		21.7		27.8	
	Neither important nor not important		29.7		35.9		33.0		33.2	
	Important		30.5	35.6	21.0	28.2	32.2	40.9	27.0	34.0
	Very important		5.1		7.2		8.7		7.0	
	Average		2.99		2.95		3.19		3.03	
Size of the packaging	Strongly not important	%	36.4	81.3	26.3	81.4	25.2	72.2	29.0	78.8
	Not important		44.9		55.1		47.0		49.8	
	Neither important nor not important		3.4		7.8		11.3		7.5	
	Important		11.9	15.3	9.6	10.8	14.8	16.5	11.8	12.8
	Very important		3.4		1.2		1.7		2.0	
	Average		2.01		2.04		2.21		2.08	
Way of Cutting	Strongly not important	%	0.0	0.0	0.0	1.8	0.9	3.5	0.2	1.7
	Not important		0.0		1.8		2.6		1.5	
	Neither important nor not important		2.5		6.6		4.3		4.8	
	Important		52.5	97.5	49.7	91.6	67.0	92.2	55.5	93.5
	Very important		45		41.9		25.2		38.0	
	Average		4.42		4.32		4.13		4.30	
Production and last consumption date (expire date)	Strongly not important	%	0.0	0.0	0.0		0.9	0.9	0.2	0.7
	Not important		0.0		1.2		0.0		0.5	
	Neither important		0.8		0.6		0.9		0.8	

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	nor not important									
	Important		56.8	99.2	56.9	97.2	47.0	98.2	54.0	98.5
	Very important		42.4		41.3		51.2		44.5	
	Average		4.42		4.38		4.38		4.42	
Hygiene conditions	Strongly not important	%	0.0	0.8	0.0	0.6	0.9	0.9	0.2	0.7
	Not important		0.8		0.6		0.0		0.5	
	Neither important nor not important		1.7		3.0		0.9		2.0	
	Important		52.5	97.4	57.5	95.4	47.8	98.2	53.2	97.2
	Very important		44.9		38.9		50.4		44.0	
	Average		4.42		4.35		4.47		4.40	
The physical appearance of meat (colour, fat ratio, arrangement in the window etc.)	Strongly not important	%	0.0	0.8	0.0	0.6	0.9	0.9	0.2	0.7
	Not important		0.8		0.6		0.0		0.5	
	Neither important nor not important		1.7		3.0		0.9		2.0	
	Important		52.5	97.4	57.5	96.4	47.8	98.2	53.2	97.2
	Very important		44.9		38.9		50.4		44.0	
	Average		4.21		4.23		4.23		4.23	
Kind of Animal feeding (pasture or stable)	Strongly not important	%	0.8	0.8	0.0	1.2	0.9	1.8	0.5	1.2
	Not important		0.0		1.2		0.9		0.8	
	Neither important nor not important		9.3		5.4		7.8		7.2	
	Important		56.8	89.9	62.3	93.4	54.8	89.4	58.5	89.5
	Very important		33.1		31.1		35.6		33.0	
	Average		3.21		3.13		3.23		3.18	

Advice from the department representative/butcher	Strongly not important		2.5	17.8	0.6	15	0.9	33.1	1.2	21
	Not important		15.3		14.4		32.2		19.8	
	Neither important nor not important	%	30.5		34.7		22.6		30.0	
	Important		47.5	87.7	47.9	50.3	41.7	44.3	46.0	49.0
	Very important		4.2		2.4		2.6		3.0	
	Average		3.36		3.37		3.13		3.30	

4.2.6. Concerns of consumers for red meat consumption

Concerns regarding some issues related to red meat consumption of consumers are shown in Table 4.45.

It has been determined that 90% of consumers care about animal diseases. The average score is 4.22. There are no significant differences between income groups. Despite the high level of concern for animal diseases, sustaining red meat consumption can be explained as one of the most basic costs of meat. In addition to the lack of information on this topic, the concerns that arise from animal diseases that occur from time to time should not be ignored. Both in red meat and white meat in Turkey and different parts of the world bird flu, mad cow disease, stalk, brucella animal diseases such as stalkers means that this perception continues to worry.

When the media reports that meat is unsafe 87.3% of consumers care. The average score was 4.16.

It was determined that 83.3% of consumers were concerned about hormone use in animal production. There is a high level of concern that hormones are present in feeds and medicines used. The average score is 4.34. It can be said that the safety of domestic breed meat which meets all the red meat consumption in general and fed under natural conditions has decreased in time. The increase in the use of artificial additives in the breeding and feeding of imported animals,

especially in the breed of culture, is the main reason for the decrease in this security. 69.3% of the consumers stated that they were worried about feeding animals with food that has artificial additives. It is seen that the concern about this issue increases as the income level increases. The average score was 4.36.

The rate of consumers who are worried about the use of antibiotics in the treatment of animals is 79.3%. The overall average score is 4.32. In connection with this issue, the rate of those who are worried about the lack of veterinary control during animal diseases and slaughterhouses is quite high (72.2%). It is seen that the average score is 4.14 and the concern increases as the income level increases. And also 8.2% is concern about the use of chemicals for red meat preservation. There is no difference significant between income groups. The average score is 4.2 and the concerning increase as the income increase.

80.3% of the consumers stated that they were concerned about the reliability of imported meats. The average score is 4.26 and there is no significant difference between the income groups. Also, 87.8% of consumers show that they are concerned about the mixing of meats with other meats and selling them.

Despite carrying out audits on this issue, it can be said that the news in the media is effective in increasing the level of concern.

Table 4.45. Consumers' levels of concern about red meat

	Degree of worry		Low income		Average income		High income		General	
Animal disease	Strongly don't worry	%	0.8	3.3	0.0	4.2	1.7	10.4	0.8	5.8
	Don't worry		2.5		4.2		8.7		5.0	
	Neither worry nor don't worry		2.5	2.4	3.5	2.8				
	Worry		52.5	90.3	55.7	92.2	59.1	86.1	55.8	90
	Strongly worry		38.1		36.5		27.0		34.2	
	I don't know		3.4	1.2	0.0	1.5				
	Average		4.35	4.28	4.01	4.22				
News in the media that meat is not safe	Strongly don't worry	%	0.8	5.0	0.0	4.8	1.7	11.3	0.8	6.8
	Don't worry		4.2		4.8		9.6		6.0	
	Neither worry nor don't worry		1.7	5.4	5.2	4.2				
	Worry		53.4	89.8	55.7	88	58.3	83.5	55.8	87.3
	Strongly worry		36.4		32.3		25.2		31.5	
	I don't know		3.4	1.8	0.0	1.8				
	Average		4.30	4.21	3.95	4.16				
Use of hormones in animal production	Strongly don't worry	%	0.8	4.2	0.0	4.2	1.7	11.3	0.8	6.3
	Don't worry		3.4		4.2		9.6		5.5	
	Neither worry nor don't worry		2.5	4.8	5.2	4.2				
	Worry		38.1	84.7	40.7	82.6	53.9	82.6	43.8	83.3
	Strongly worry		46.6		41.9		28.7		39.5	
	I don't know		8.5	8.4	0.9	6.2				
	Average		4.52	4.46	4.01	4.34				
Antibio- tic use for animals health	Strongly don't worry	%	0.8	4.2	0.0	4.8	1.7	11.3	0.8	6.6
	Don't worry		3.4		4.8		9.6		5.8	
	Neither worry nor don't worry		5.1	5.4	9.6	6.5				
	Worry		37.3	79.7	40.7	79.6	50.4	78.2	42.5	79.3
	Strongly worry		42.4		38.9		27.8		36.8	
	I don't know		11.0	10.2	0.9	7.8				
	Average		4.50	4.44	3.96	4.32				
Not enough veterinary control in	Strongly don't worry	%	0.8	5.0	0.0	4.8	1.7	11,3	0.8	6.8
	Don't worry		4.2		4.8		9.6		6.0	
	Neither worry nor		10.2	15.0	10.4	12.2				

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slaughterhouses	don't worry									
	Worry		45.8	72.1	45.5	68.9	57.4	77.4	49.0	72.2
	Strongly worry		26.3		23.4		20.0		23.2	
	I don't know		12.7		11.4		0.9		8.8	
	Average		4.31		4.22		3.87		4.14	
Feeding of animals with artificial additives	Strongly don't worry	%	0.8	5.0	0.0	4.2	2.6	12.2	1.0	6.8
	Don't worry		4.2		4.2		9.6		5.8	
	Neither worry nor don't worry		7.6		8.4		11.3		9.0	
	Worry		33.1	66.2	37.7	70	49.6	71.3	39.8	69.3
	Strongly worry		33.1		32.3		21.7		29.5	
	I don't know		21.2		17.4		5.2		15.0	
	Average		4.57		4.50		3.94		4.36	
Imported meats	Strongly don't worry	%	0.8	2.5	0.0	2.4	1.7	8.7	0.8	4.3
	Don't worry		1.7		2.4		7.0		3.5	
	Neither worry nor don't worry		8.5		4.8		10.4		7.5	
	Worry		50.0	77.1	52.1		60.0	80.9	53.8	80.3
	Strongly worry		27.1		29.9	82	20.9		26.5	
	I don't know		11.9		10.8		0.0		8.0	
	Average		4.36		4.42		3.91		4.26	
Mixing meat with other meats for sale	Strongly don't worry	%	0.8	3.3	0.0	4.2	1.7	10.4	0.8	5.8
	Don't worry		2.5		4.2		8.7		5.0	
	Neither worry nor don't worry		2.5		2.4		6.1		3.5	
	Worry		29.7	89	32.3	90.4	51.3	82.6	37.0	87.8
	Strongly worry		59.3		58.1		31.3		50.8	
	I don't know		5.1		3.0		0.9		3.0	
	Average		4.59		4.53		4.04		4.41	
Use of preservative chemicals in meat preservation	Strongly don't worry	%	0.8	3.3	0.0	4.2	1.7	10.4	0.8	5.8
	Don't worry		2.5		4.2		8.7		5.0	
	Neither worry nor don't worry		6.8		9.0		9.6		8.5	
	Worry		49.2	77.2	44.9	82.6	59.1	80	50.2	80.2
	Strongly worry		28.0		37.7		20.9		30.0	
	I don't know		12.7		4.2		0.0		5.5	
	Average		4.39		4.29		3.89		4.20	

4.2.7. Effect of possible changes in red meat prices on purchase quantity

In this section, the extent to which red meat consumption of consumers will be affected against the increase and decrease in meat prices by 10% and 30% has been investigated. 7.3% of consumers stated that they would not be affected by the 10% increase in red meat prices. The rate of those who stated that they would be affected by was 37.5%. In contrast to the 30% increase in prices, 2.2% of consumers will not be affected and 93.0% will be affected.

Significant differences were found in terms of income groups against possible increases in red meat prices. Accordingly, the increase in prices by 10% is seen to be more affected by consumers in the low-income group (55.1%) than in the middle (35.3%) and high income (9.6%) consumers.

Similarly, it was determined that the consumers in the low-income group (95.8%) were more affected than the consumers in the middle (80.0%) and high-income groups (65.7%) against the 30% increase in prices. When the data on the general environment is evaluated, it is seen that the rate of affected consumers increases between 10% and 30% increase (Table 4.46.). According to the results of the chi-square analysis, it was determined that the level of 10% and 30% price increase affected consumers differently according to income groups. Accordingly, it has been found that there is an inverse relationship between income level and consumers being affected by the price increase. Accordingly, it has been found that there is an inverse relationship between the income level and the situation where consumers are affected by the price increase. The effect of the decrease in red meat prices on the amount of purchase.

Table 4.46. Effect of the increase in red meat price on the amount of purchase

	Degree of effect		Low income		Average income		High income		General	
10% increase in prices	Strongly doesn't affect	%	0.8	5.0	0.6	3.0	4.3	15.6	1.8	7.3
	Doesn't affect		4.2		2.4		11.3		5.5	
	Neither affect nor doesn't affect		39.8		61.7		46.1		55.2	
	Affect		36.4	55.1	31.7	35.3	11.7	9.6	34.2	37.5
	Strongly affect		15.3		3.6		2.1		3.2	
	Average		3.37		2.35		1.25		2.32	
Chi-square analysis results			Chi-square Value X^2				Significance level (p-Value)			
			20.311				0.000			
30% increase in prices	Strongly doesn't affect	%	0.8	1.6	0.6	6	1.7	5.2	1.0	2.2
	Doesn't affect		0.8		5.4		3.5		1.2	
	Neither affect nor doesn't affect		2.5		15.8		29.1		15.8	
	Affect		31.4	95.8	29.5	80.0	31.3	65.7	32.2	80.5
	Strongly affect		64.4		50.5		34.4		60.8	
	Average		4.58		4.53		4.39		4.51	
Chi-square analysis results			Chi-square value X^2				Significance level (p-Value)			
			10.142				0.000			

Table 4.47. shows that the red meat consumption of consumers with a decrease of 10% and 30% in prices will be affected. 45.2% of the consumers stated that their consumption would not be affected against the 10% price decrease and 36.8% would be affected. In the case of the 30% decrease in prices, 20.0% of consumers stated that their consumption would not be affected and 74.6% said they would be affected.

The effect of the price decrease varies according to income groups. A 10% decrease in price will affect the consumption by 38.8% of the low-income group, 39.9% of the average-income group, and 23.9% of the high-income group. The decrease in meat prices by 30% will affect the low, average- and high-income consumers by 83.3%, 81%, and 59.5% respectively. It is seen that price decreases will affect, especially on middle-income consumption. When the average score of consumers about the effect of price decreases is examined, the values for the average-income group are higher (3.26 for 10% decrease and 4.54 for 30% decrease). It can be said that the sensitivity of the consumers in the low- and high-income groups to price decreases is lower than the middle-income group. This situation can be interpreted as the middle-income consumers tend to have more red meat consumption in the case of price decreases. Assuming that red meat consumption of high-income households is at a sufficient level, it can be considered that consumption is not affected by the decrease in meat prices as much as the middle-income group. On the other hand, even if low-income households do not have sufficient income, this means that their consumption will increase in the case of a decrease in red meat prices.

As a result of chi-square analysis, it was determined that the 10% and 30% decrease in red meat prices had an effect on consumption and showed differences according to income groups. Accordingly, it was found statistically that consumers in low-income groups could increase their consumption amounts against price decreases and it was found significant at a 1% level.

Table 4.47. Effect of the decrease in red meat prices on the amount of purchase

	Degree of worry		Low income		Average income		High income		General	
10% decrease in prices	Strongly doesn't affect	%	20.0	44.2	10.6	33.6	26.7	57.8	0.8	45.2
	Doesn't affect		24.2		23.0		31.1		4.2	
	Neither affect nor doesn't affect		11.0		25.9		18.3		18.0	
	Affect		34.8	38.8	29.3	39.9	20.9	23.9	32.2	36.8
	Strongly affect		4.0		10.6		3.0		4.2	
	Average		3.31		3.26		3.24		3.27	
Chi-square analysis results			Chi-square value X^2				Significance level (p-Value)			
			6.922				0.0000			
30% decrease in prices	Strongly doesn't affect	%	10.0	10.8	6.2	11.8	19.7	42.3	19.0	20.0
	Doesn't affect		0.8		5.6		22.6		21.0	
	Neither affect nor doesn't affect		5.9		7.2		6.2		6.4	
	Affect		31.4	83.3	29.3	81.0	27.8	59.5	29.5	74.6
	Strongly affect		61.9		61.7		61.7		44.8	
	Average		4.50		4.54		4.45		4.50	
Chi-square analysis results			Chi-square value X^2				Significance level (p-Value)			
			4.750				0.000			

4.2.8. Consumers attitude toward meat reliability

The relationship between consumer willingness to pay meat with the label "it was produced from animals that were raised under conditions that are suitable for animal welfare" and the income was investigated and the table 4.48 was created. It was determined that there was a significant relationship between them. The proportion of those who wanted the label increase as the income increases.

While in the high-income group 47.2% of consumers want the information "It was produced from animals that were raised under conditions that are suitable for animal welfare" to be on the product, in the low- and middle-income group it was in the high income and 31.7% respectively. While in the low-income group 50% of the consumer never thought about it, in the middle-income group it is 46.7% and in the high-income group, it is 37.4%.

And almost 20% of people don't care about the label or don't want it.

Table 4.48. People wanting the label "It was produced from animals that were raised under conditions that are suitable for animal welfare" on the product

	Lower-income	Averag-income	Higher-income	Average
I want	24.6	31.7	47.8	34.2
I don't want	15.3	10.2	5.2	10.2
Never think about it	50.0	46.7	37.4	45.0
It doesn't matter	10.2	11.4	9.6	10.5

One of the important issues that consumers should pay attention to is when buying red meat, the safety of the meat. The reliable and institutional identity of the butchers or grocery stores where the meat was bought is the most important factor in this regard. Beyond this goal, if the certificate is given that the red meats are safe, 13% of consumers in the low-income group accept to pay more of the meat price, 46.9% of consumers in the middle-income group, and 30.1% in the high income (table 4.49.).

Table 4.49. Proportion of consumers willing to pay more if the meat is safe

	Yes
Lower income	13.0
Average income	46.9
High income	30.1

In the case of a document showing that red meats are safe, consumers in the low-income group accept to pay 5.19% more of the meat price, consumers in the middle-income group accept 13.33%, and consumers in the high-income group 15.02% (table 4.50).

Table 4.50. Consumers willingness to pay more in case of guaranteeing red meat reliability (%)

	Average (%)	Standard deviation
Lower-income	5.19	6.67
Average-income	13.33	7.94
High-income	15.02	9.85
Average	11.18	7.34

It is known that the traceability of red meat from farm to consumer is very difficult. Especially the increase in the vehicles strengthens the traceability and the recording may cause distortion.

The length of the supply chain in red meat leads to the inclusion of loops that are unregistered in the chain, and while the risks related to food security increase, it becomes difficult to ensure traceability. In this context, food security can be ensured by creating supply chain management. The supply chain process should be of a farm, abattoir, storage, processing, packaging, shipment, and sale. Also, the establishment of the label system that will ensure the traceability of the product and providing information about the production and processing process to

the consumer are among the factors that will increase the reliability of the product (Gunes, 2004).



5. CONCLUSION AND SUGGESTIONS

Consumption of red meat is considered an element of development in the world and it is observed that the consumption amount has been increasing especially in the developing countries in recent years. According to the WHO, red meat consumption should be around 33 kg per capita per year. But in Turkey, this amount is hardly around 12.4 kg. In our study in Adana, the average is 22.02 kg per capita per year which is above the average of Turkey. That can be explained by the consumers' habit of living in the area, income level, livestock potential in the region, regular functioning of the market structure.

In fact, after 1990, the changes in the foreign trade regime, the importance of crop production in agricultural policies, the steps were taken towards the privatization of SEK, YEMSAN, and EBK, which were effective in the animal products markets, had a negative impact on the livestock sector in Turkey.

The livestock sector in Turkey, have the majority of family-type businesses consisting of individuals living in rural areas, opening herbal production of range and pasture land. Animal production began to shrink with the rural development, the migration from rural to urban areas, illegal animal products from border countries. Also, it is seen that one of the biggest reasons for the shrinkage in the livestock sector after 1990 is the complete disappearance of state authority in the market with the privatization of the institutions operating until that period. In this context, the negative consequences of this step taken with the idea of the free economy have dragged the livestock of the country into an even narrower throat today.

The rapid decline in animal assets after 1990 shows itself, especially in small ruminant breeding. With the mad cow disease that emerged in 1997, a change was made in the foreign trade regime, and banning the import of live animals and red meat continued until 2010.

The livestock sector, which could not produce at a level to meet the increasing demand in the said period, experienced a rapid shrinkage, especially in the 2007-2009 period. Red meat production, which was 575 611 tons in 2007, decreased to 412 599 tons in 2009. The rapid decline in supply was accompanied by a rapid rise in prices. Imports of livestock and red meat were released in 2010 to prevent rising animal prices in the market, and after the EBK, private sector quotas were increased and customs duties were lowered.

The policies implemented from 1990 through 2018 did not give the desired result and the country has become more and more foreign dependent.

As a result of the field research, it has been determined that the price is the most important factor affecting the consumption of red meat, although it varies according to income groups. It is concluded that the research results are parallel with the basic concepts related to the demand of the economy. Consumers will consume red meat in the face of price reductions and increase the amount of consumption with increased income. The fact that they are referring to the replacement products due to the increase in red meat prices is among the factors affecting the demand and the amount of demand.

It has been determined that 90% of consumers have experienced a change in red meat consumption in the past years and this change is mostly in the direction of decrease (76.2%). It was determined that the most important reason for the decrease in consumption amount was the price, but this rate was different compared to income groups and it was found that it was more effective especially in the lower-income group.

It is an expected result that the increase or decrease in red meat prices will affect the consumption amount. Possible decreases in prices are affected by the consumption of red meat consumers, according to income groups. It has been determined that the consumption in the middle-income group will increase more if there is a 10% and 30% decrease in red meat prices. It is determined that consumption in the low-income group will increase more. This situation can be

explained by the fact that the consumers in the lower-income group do not experience any change in the purchasing power, while the consumers in the high-income group have a sufficient level of consumption. On the other hand, the relationship between income growth and consumption amount can be considered linear when other factors are kept constant. Even if there is an inverse proportion between the price decrease and the amount of consumption, the fact that it is a compulsory and luxury food product is an important factor in red meat consumption. In addition, although food consumption is compulsory, the increase in consumption of red meat is limited, regardless of household level.

A conclusion about the red meat prices in the study is related to the change in the quantity of consumers' demand for other substitute products in the face of the increase in red meat prices. Besides the price, we have an income increase in households, consumer awareness, and preferences, demographic features, development of marketing channels, etc that affect consumption patterns.

In the research, the place of purchase of the consumers is handled from a different perspective and the factors that are effective in the choice of the consumers are investigated. According to the probability of binary logit model results, education, amount of red meat, meat freshness and closeness are the most important factor for the consumer while deciding to buy red meat whether in a shop or in a market.

In Turkey, the climate, soil, vegetation, geographical features, such as natural resources are quite favorable in terms of the development of the livestock sector. Policies aimed at increasing long-term production should be developed instead of short-term import policies in animal husbandry.

Turkey has structural problems such as the costs in the livestock sector, low productivity, hygiene and quality, market, and marketing issues. Along with the solution to the problems related to the sector, it is thought that it will also be successful in futures contracts to be carried out on animal husbandry.

Although it seems like a short-term solution to reduce import freedom and customs duties to prevent high meat prices in the market, it manifests itself as an application that harms the livestock industry. The only condition for supporting animal husbandry is rural development. In this context;

- Animal breeding, since there is at the desired level, animal production efficiency, decreases. Breeding work should be brought into a state policy. Ministry of Agriculture, Industry Organizations, and Universities should collaborate.
- Making arrangements to eliminate income inequality between rural and urban areas.
- Due to rising production costs, the number of cattle and sheep in Turkey has decreased significantly. Therefore, emphasis must be placed on feed costs. In particular, for the further deduction of feed costs, urgent measures should be taken. Businesses should be able to produce their own oath, to make silage.
- Preventing migration from rural to urban areas.
- Increased in recent years, the number of animals on the run. Not subjected to any control, such animals cause a significant reduction in the number of animals and animal diseases increased. Food, Agriculture and Livestock Ministry by, No. 2015/04 Combating Animal Disease Control and Animal Movement Circular was issued. This circular should be applied rigorously.
- To combat animal diseases, veterinary services should be expanded first. Vaccination programs should be organized. In particular, the spread of disease areas should be determined. These animals should be kept under quarantine or should be culled. The cost of these animals must be paid timely and fully.
- Public investments to meet the needs of rural people.

- Increasing the training and extension studies for animal husbandry.
- Increasing the support for fattening cattle, Purchase guarantee for living animals and red meat produced, in other words, a market must be found for producers
- For animal production in Turkey, a system of incentives based on different regions, are implemented. In incentives for the agricultural sector, the share allocated to the livestock sector is quite high. Enough to take advantage of these incentives should be given to training activities (Mustafa Kaymakçı et al, 2000:780).



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ATTACHMENTS



**ADANA İLİ KENTSEL ALANDA KIRMIZI ET TÜKETİM YAPISI VE TÜKETİCİ
DAVRANIŞLARI**

ANKET NO:.....

TARİH:/...../.....

Anketör:.....

İL:..... İLÇE:..... Mahalle:.....

1. GÖRÜŞME YAPILAN KİŞİ VE DİĞER AİLE BİREYLERİNE İLİŞKİN BİLGİLER

	Cinsiyet	Yaş	Eğitim durumu	Mesleği	Hangi tür kırmızı et tüketimini tercih ediyor (*)	Kırmızı Et Tüketmiyorsa nedeni (**)
1						
2						
3						
4						
5						
6						
7						
8						

(*) 1) Dana eti 2) Koyun eti 3) Keçi eti

(**) 1) Sağlık Sorunu 2) Vejeteryan olması 3) Sevmemesi 4) Ekonomik durum 5) diğer.....

2. Ailenin ortalama aylık geliri:.....TL

3. Ailenin ortalama aylık gıda harcaması:.....TL

4. Ailenin ortalama aylık gıda harcaması içinde KIRMIZI ET için tüketimine yapılan harcaması:.....TL

5. Kırmızı Et ve et ürünlerini ortalama ne kadar tükettiğinizi belirtir misiniz?

Ürünler	Satın alınan miktar (kg/ay)	Evde kesilen veya kestirilen miktar (kg/ay)	Dışarıda tüketilen (restorant, piknik vs.) (kg/ay)	Satınalma Sıklığı (*)	Satınalınan Yer (**)	Harcanan Tutar (TL/ay)
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Sığır eti	Kıyma						
	Kuşbaşı						
	Parça et (but, kol, kaburga vs.)						
	Bonfile, pirzola, biftek vs.,						
	Diğerleri						
Koyun & Keçi eti	Kıyma						
	Kuşbaşı						
	Parça et (but, kol, kaburga vs.)						
	Bonfile, pirzola, biftek vs.,						
	Diğerleri						
Sucuk, pastırma vs et ürünleri							
Sakatat							

(*) **Satınalma Sıklığı :** 1) Haftada bir, 2) haftada 2-3 kez, 3) 15 günde bir, 4) ayda bir 5)diğer.....

(**) **Satınalınan yer :** 1) Kasap, 2) Küçük market, 3) Süpermarket 4) Diğer.....

6. Son yıllarda kırmızı et tüketim miktarınızda ;

Eğer azalma varsa nedenleri	☐ Kırmızı et fiyatlarının artması ☐ Gelir yetersizliği ☐ Sağlık sorunları ☐ Hijyen koşulları ve güvenilirlik yetersizliği ☐ İthal ürün kalitesini beğenmeme ☐ diğerleri.....
Eğer artış varsa nedenleri	☐ Kırmızı et fiyatlarının azalması ☐ Gelir artışı ☐ Et kalitesinin artması ☐ Sağlık açısından yararlı bulma ☐ diğerleri.....

7. Aylık kırmızı et tüketiminizin yeterli olduğunu düşünüyor musunuz?

Fazlasıyla yeterli	Yeterli	Ne yeterli ne değil	Yetersiz	Oldukça yetersiz

8. Kırmızı et satın alınırken dikkat edilen hususlar

	1	2	3	4	5
A Aile üyelerinin tercihleri					
B Fiyat					
C Hayvanın hangi bölgede yetiştirildiği					
D Ambalajın büyüklüğü					
E Kesim şekli					
F Üretim ve son tüketim tarihi					
G Hijyen koşulları					
H Etin fiziki görünümü (rengi, yağlılık oranı, vitrindeki düzenleme vb)					
I Hayvanın beslenme türü (merada veya beside)					
J Reyon görevlisinin/kasabın tavrı ve et konusundaki bilgi düzeyi					
K Reyon görevlisinin/kasabın tavsiyesi					
L Hayvan türü					
M Diğer					

1) Hiç önemli değil, 2) Önemli değil, 3) Ne önemli ne önemsiz, 4) Önemli, 5) Çok önemli

9. Kırmızı eti genellikle ne şekilde satın alırsınız?

A) Karkas B) Porsiyonluk C) Kemiksiz D) Diğer.....

10. Kırmızı eti tüketim sıklığı

A) Hergün B) Haftada 1-3 C) Haftada 4-6 D) Ayda 1 E) Ayda 3-5 F) Diğer

11. Kırmızı eti tüketim şekli

A) Izgara B) Haşlama C) Sebzeli D) Farketmez E) Diğer.....

12. Kırmızı et fiyatları ile ilgili düşünceler

	1	2	3	4	5
Sığır Eti					
Koyun Eti					
Keçi Eti					
Et ürünleri (pastırma, sucuk vb)					
Sakatat					

1) Çok ucuz, 2) Biraz ucuz, 3) Normal, 4) Biraz pahalı, 5) Çok pahalı

13. Bir önceki yıla göre kırmızı et tüketimindeki değişim

A) Arttı B) Değişmedi C) Azaldı

14. Eğer, kırmızı et fiyatları düşerse tüketiminde değişme olur mu?

A) Artar B) Değişmez C) Azalır D) Bilmiyorum

15. Eğer, geliriniz artarsa kırmızı et tüketiminde değişme olur mu?

A) Artar B) Değişmez C) Azalır D) Bilmiyorum

16) Kırmızı Eti Kasaptan Satın Alıyorsanız - Alma ve Almama Nedenleri

a) Kasaptan Satın Alma Nedenleri

	Önemsiz	Biraz önemli	Önemli	Çok önemli
Daha taze olduğu için				
Fiyatları daha uygun olduğu için				
Kasap tanıdık olduğu için				
Veresiye imkanı olması				
Yakın olması				
Alışkanlık				
Đstenilen özellikte satın alabilme				
Điđer (belirtiniz)				

b) Kasaptan Satın almama nedenleri

	Önemsiz	Biraz önemli	Önemli	Çok önemli
Hijyenlik konusunda şüphem olduğu için				
Etle birlikte diğer ihtiyaçlarımı temin etme olanağım olmadığı için				
Alışveriş ortamının rahat olmadığını düşündüğüm için				
Güvenilir bulmadığım için				
Diğer (belirtiniz)				

17. Kırmızı et ürünleri satın alırken ürün etiketinde “hayvan refahına uygun şartlarda yetiştirilmiş hayvanlardan üretilmiştir” bilgisi ister misiniz?

A) Evet isterim B) Hayır istemem C) Hiç düşünmedim D) Fark etmez

18. Hayvan refahı kriterlerine uygun bir şekilde yetiştirilmiş hayvanlardan elde edilen ürünler için fazladan ücret öder misiniz?

A) Evet B) Hayır

Evetse, % kaç daha fazla ödemeye razı olursunuz?

%.....

19. Güvenli ve Kaliteli olduğunu bildiğiniz Kırmızı et ve ürünlerine fazladan ücret öder misiniz?

A) Evet B) Hayır

Evetse, % kaç daha fazla ödemeye razı olursunuz?

%.....

20. Tükettiğiniz ürünlerle ilgili GIDA GÜVENİLİRLİĞİ düşünceniz

	1	2	3	4	5
Sığır Eti					
Koyun Eti					
Keçi Eti					
Et ürünleri (pastırma, sucuk vb)					
Sakatat					

1) Hiç güvenmiyor, 2) Güvenmiyor, 3) Fikri yok, 4) Güveniyor, 5) Çok Güveniyor

21. Kırmızı et ile ilgili olarak aşağıda belirtilen konular sizi ne derece endişelendiriyor?

	Hiç endişelen-dirmiyor	Endişelen-dirmiyor	Ne endişelen-diriyor ne değil	Endişelen-diriyor	Çok fazla endişelen-diriyor	Bilgim yok
Hayvan hastalığı						
Medyada etlerin güvenilir olmadığına dair haberler						
Hayvansal üretimde hormon kullanımı						
Hayvanların tedavisinde antibiyotik kullanımı						
Mezbalalarda veteriner kontrolünün yetersiz olması						
Satış yerlerindeki muhafazası ve değerlendirilmesi						
Hayvanların suni katkı maddeli yemlerle beslenmesi						
İthal edilmiş etler						
Etlerin başka etlerle karıştırılıp satışa sunulması						
Etlerin muhafazasında koruyucu kimyasal kullanımı						
Başka satış yerlerine göre ucuz olması						
Et ve Süt Kurumunun anlaşmalı marketler ile et satışı						

22. Kırmızı et fiyatlarındaki artış satın alma miktarınızı ne kadar etkiler?

Artış miktarı	Hiç etkilemez	Etkilemez	Ne etkiler ne etkilemez	Etkiler	Çok fazla etkiler
%10					
%20					
%30					

23. Kırmızı et fiyatlarındaki azalış satın alma miktarınızı ne kadar etkiler?

Azalış miktarı	Hiç etkilemez	Etkilemez	Ne etkiler ne etkilemez	Etkiler	Çok fazla etkiler
%10					
%20					
%30					