



A Research on Red Meat Consumption and Preferences: A Case Study in Tekirdağ Province

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ARTICLE INFO

Article history:

Received 18 February 2015

Accepted 11 March 2015

Available online, ISSN: 2148-127X

Keywords:

Red meat

Consumption

Consumer decisions

Logit model

Tekirdağ

ABSTRACT

In this study, 384 persons have been subjected to questionnaire made in order to determine the red meat consumption and preferences of the people living in the central district of Tekirdağ province. In the study it was determined that all the consumers consumed red meat. According to the findings of the research, the annual red meat consumption per capita was determined to be 34.22 kg. Considering the red meat consumption of the people subjected to research, it was determined that beef meat was the most preferred kind among all the other kinds of red meat. In the study, it was determined that in red meat buying place preference consumers prefer traditional retailers such as butcher been specialized. Consumers prefer red meat due to be the most nutritious, respectively be healthy, delicious, habit and easy to access. It was determined that 47.5% of consumers participated in the study were ready to pay extra for red meat in the food safety. It was determined 75.6% people participated in the study consume more red meat if the price of red meat cheapens. A logit model was used for analyzing the factors that influence the red meat consumption of the families participating in this research. According to the logit model results, it was determined that the families' red meat consumption amount is affected from statistical variables such as; number of family members, education level, spouse's employment status, income, cheapening of the price of red meat.

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Introduction

All living beings have to feed themselves to survive (Yılmaz and Özkan, 2007). Food is deemed and cited among the most basic physiological needs of the human beings. Plant and animal origin food should be consumed as required by the metabolism for completion of physiological needs (Onurlubaş, 2011). Although, according to most studies on the socio-economically high income group, a healthy diet is considered to be one containing more fruit and vegetable and less fat and meat (Roos et al., 1996; Erkkila et al., 1999; Irala-Estevez et al., 2000; Villegas et al., 2003) 40-50% of the protein need should be of animal origin in a healthy and well-balanced nutrition. Meat plays significant share among the animal origin protein sources. Meat is food, which contains all amino acids of different type, quantity and rate which are necessary for growth, living and physiological functions of the human beings (Göğüş, 1986). It is, of course, a fact that proper and balanced nutrition along with training and health indicators is considered as a significant factor in term of socio-economic development (Yağmur and Güneş, 2010).

Income of the individuals is the most important factor determining purchase. Income inequality is the first one among the most important problems encountered by the undeveloped, underdeveloped and developing countries. This inequality income distribution also reflects consumption structure of the individuals. A measure of the development level of the countries is quantity of meat consumed per capita. While meat consumption per capita in Turkey is 12 kg annually, it is 96.1 kg for Argentina, 91.4 kg for Australia, 95.1 kg for Brazil, 82.7 kg for Canada, 77.1 kg for EU, 58.7 kg for Russia and 107.5 kg for USA (Fapri, 2012). One of the basic reason of such low consumption of red meat in our count TL, it is, as usual worldwide, expensive compared to other food items (Tömek, 1989).

Many studies have been made concerning red meat consumption (Çivi et al., 1993; Richardson, 1994; Kaabia et al., 2001; Yıldırım et al., 1998; Sanchez et al., 2001; Corsi and Novelli, 2002; Gossard and York, 2003; Gracia and Zeballos, 2003; Atay et al., 2004; Aygün et al., 2004; Kara et al., 2004; Cosgrove et al., 2005; Gündüz et al.,

2006; Guenther et al., 2005; Tosun and Hatırlı, 2009; Yıldırım and Ceylan, 2007; Sarıözkan et al., 2007; Karakaş, 2010; McAfee et al., 2010; Yaylak et al., 2010; Şeker et al., 2011; Ulaş, 2011). 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 beings, other factors affecting meat consumption by the consumers are also important. Conducted in the central district of Tekirdağ, this study examines the factors that affect consumption of red meat by determining household tendency of red meat consumption. Thus the red meat consumption preferences of the consumers and factors affecting the consumer preference and important of the red meat in the diet profile of the households will be determined.

Materials and Methods

Main material of the study is data from the survey conducted with the families in the central district of Tekirdağ in 2013. In order to determine number of families to be surveyed, the total population in the central district (150.112) was found from the official records. In this study, following formula was used to determine sample volume (Baş, 2008).

$$n = \frac{N * t^2 * p * q}{d^2 * (N - 1) + t^2 * p * q}$$

For determination of the sample volume, the study was based on 5% error tolerance within the confidence limit of 95%. As a result of the calculation, the sample volume was found as 384.

In the study, Logit model was used to determine the factors that affect quantity of red meat consumption by the consumers that consume red meat in the center district, Tekirdağ.

In the Logit regression analysis method, social and economical aspects have also been approached on the consumer profile such as consumer attitude and behaviours (Akyıldız and Marangoz, 2008; Özer and Lebe, 2008; İnal et al., 2006). Logit regression model is a nonlinear regression model that has been designed for at least two dependent variables. In other words, it is a nonlinear model that can be linearize with appropriate conversions (Stock and Watson, 2007).

Logit model has been used to identify the factors affecting families' red meat consumption amount in the central district of Tekirdağ. Logit model describing the logistic distribution function can be written as below (Greene, 2000).

$$P_i = E(Y_i = 1 / X_i) = \frac{1}{1 + e^{-(\alpha + \beta X_i)}}$$

In the study in order to describe the increase possibility in red meat consumption amount; annual average red meat consumption (12kg) amount for per capita in Turkey has been taken into account as a criteria. In this case the probability of red meat consumption over

12kg for per capita in a family will be (P_i), when it comes to the probability of red meat consumption in 12kg and under will be ($1 - P_i$). Accordingly; $P_i / (1 - P_i)$ is the ratio of the probability of consuming red meat of a family more than average (12kg) to the probability of consuming less red meat. Then; when Logit model is written as;

$$P_i = \ln\left(\frac{P_i}{1 - P_i}\right) = \beta_1 + \beta_2 X_i$$

β_2 will define the coefficient slope; X_i will define independent variables. According to them; it can be guessed that how a unit more red meat consumption probability in X changes logarithmic rate to less red meat consumption.

Research and Findings

Consumers surveyed were consisted of male by 50.3% and female 49.7%. Of the consumers, the bachelors were 15.4%, married 80.4% and divorced 4.2% divorced. In the survey, the persons were in the age group of 18-25 by 17.7%, 26-30 by 23.4%, 31-40 by 30.2, 51-60 by 8.1% and 61 and above by 3.4%.

As to the education status of the persons surveyed, they are illiterate by 2.9, illiterate by 0.8%, primary school graduate by 6.8%, secondary school by 10.4%, high school by 40.4% and university 37.2%, 1.0% master degree and 0.5% doctoral degree.

Of the persons surveyed, they are self-employed by 38.3%, worker by 24.5%, civil servant by 15.9%, housewife by 16.1% and unemployed by 5.2%. Of the consumers surveyed, number of family members is 4.03 in average. And 75.6% of the consumers had a working spouse.

Looking at the annual income of the consumers, it is 510 \$ by 6.0%, 511-765 \$ by 13.3%, 766-1020 \$ by 26.0%, 1021-1275 \$ by 27.9%, 1276-1786 \$ by 20.1% and 1787 \$ by 6.7%.

Monthly food expenditure of the consumers is 383 \$ in average. It was determined that all consumers participated in the study consumed red meat. In a study by (Yalçınkaya, 1999) on 140 families in Erciş district, city of Van, red meat consumption account for 50.87% of the animal origin food consumption by the families.

Red meat consumption per capita was 34.22 kg annually. In another study by Kara et al. (2004), it was found that monthly meat consumption per family in the city of Van was 5.5 kg/month in average and monthly meat consumption per capita was 980 g. In the study by Karakuş et al. (2008), it was found among the surveyed people in Gaziantep that 51.9% of the consumed less than 3 kg red meat in a month. Atay et al. (2004) recorded rate of the people consuming meat less than 3 kg was 63.4%. And Uluat (2002) determined in a study he conducted on 120 families in the central district of the city of Van that annual average of red meat consumption per household was 63.85 kg. According to the study, while 65.1% of the consumers considered red meat consumption as sufficient, 34.9% did not consider so.

75.6% of the persons surveyed stated that they would consume more red meat if it becomes cheaper.

Of the surveyed persons, 80.2% considered red meat consumption to be necessary for balanced nutrition, 2.5% did not consider it necessary and 17.2% had no idea about it.

According to the study, the consumers bought red meat from butcher by 37.2%, from supermarket by 26.3%, 25.8% from market and 10.7% from hypermarket. For purchase of fresh meat, the consumers still prefer traditional retailers specialized in the matter (Gracia, 2005). It was so according to many studies as well. In the study made by Onurlubaş (2011), it was established that the butchers are the first preference of the consumers to buy red meat (51.1%). Tosun (2006), in his study, stated that the consumers most preferred the butchers to buy red meat in Ödemiş. And in his study in the central district, city of Van, Uluat (2002) established that the 83.3% of the consumers bought the meat from the butchers and Yalçınkaya (1999), in his study in the district of Ercis, city of Van, found out that the 92.9% of the consumers bought red meat from the butchers.

The consumers participated the survey preferred the butcher to buy red meat for the following reasons: 59.4% freshness, 57.6% reliable, 43.5% hygiene, 40.4% delicious, 31.8% cheap, 25% diversity, 24.7% habit, 22.7% easy to find, 19.5% easy to access; 18.5% credit card option; 17.7% custom order and 10.2% credit facility. (Tosun and Hatırlı, 2009) stated that the families considered most the freshness and hygienic conditions when purchasing red meat.

22.9% of the consumers consume red meat 12 kg or less; 77.1% above 12 kg. While beef ranks first (75.5%) in the red meat consumption by type of animal, it is followed by sheep (19.8%) and goat (4.7%). In a study made by Gaytancıoğlu (1999), it is found out that 27.8% of the consumers preferred veal. In the study made by Atay et al., (2004), veal is the first preference of the families for red meat (80%). And (Yıldırım et al., 1998) determined that the families preferred sheep by 49.1%, beef by 34.22% and 16.7% without any special preference.

Looking at the way of consumption of the red meat, 62% consumed it in any way, 22.4% used it in the meal, 14.8% as grilled, 13.5% roasted, 8.1% as boiled and 6.8% as deep fried.

In the study, looking at the reasons why consumers preferred red meat, it is most preferred for its nutrition value (28.3%) followed by healthy (25.4%), delicious (23%), habit (18.3%) and easy accessibility (5%). In the urban area of the city of Tokat, the reasons of the consumers to consume meat and meat products include high nutrition value, habits, health and easy accessibility of the place to purchase (Karakas, 2010).

When the consumers buy red meat, they pay attention most to reliability (45.4%), freshness (35.1%), price (16.1%), fat-free meat (3.4%). Looking at the version of red meat the consumers prefer, 60.6% preferred it in large parts, 29.8% as minced and 9.6% as bony. Of the consumers that buy red meat in large parts, 64.8% preferred in small pieces, 13% as chopped steaks, 11.2% as beef steak and 10.5% as sirloin steak.

Out of the participants of the study, 47.5% was ready to pay more for the red meat certificated for food safety, 52.5% was not willing to make any extra payment for it. Those ready to make extra payment told they may pay more by 14.38% for the certificated red meat.

The study showed that 55.2% of the consumers consumed specialty meat and 44.8% did not. Consumers purchased specialty meat from the butcher (69.2%), supermarket (16.4%), market (9.3%) and hypermarket (5.1%). Specialty meats most consumed by the consumers are liver (49%), tripe (14.1%), kidney (10.3%), heart (10.2%), spleen (9.1%) and sheep's head and food (7.3%).

While 84.6% of the consumers consumed products soujouk, sausage and salami made of red meat, 15.4% did not. 25.3% of these consumers of the products such as soujouk, sausage and salami consumed them always, 59.4% sometimes and 15.3% rarely.

In the study, the quantity of red meat consumption was taken as dependent variable in the Logit model established to determine the factors that affect red meat consumption in the central district, city of Tekirdağ.

In this line, to describe possibility of increase in the consumption of red meat, the following variables were defined:

(KETM) = "0", (if a person consumes red meat 12 kg and less annually)

(KETM) = "1", (if a person consumes red meat 12 kg and above annually.)

Results of Logit Regression Model

Starting model was first established to determine the proper model. And then according to the results of statistical significance level of the variables in the starting model, the most suitable model was found by adding or removing a number of variables to and from the model.

The study used totally 12 variables in the starting model. As a result of the trial models, the most suitable model consisting of the variables statistically significant was found. The find the most suitable model, model trials were made by the variables in the range of those statistically significant levels near 10% and those drawing away from 10% (Tüzüntürk, 2007). Decision on the most suitable model was made by looking at Hosmer and Lemeshow test indicating chi-squared values and distribution. Table 1 shows the estimated results of the most suitable binary logit regression model. Examining the estimated results of the binary multi regression model given in Table 1, statistically significance levels were determined for 8 independent variables.

McFadden R^2 value that indicates the explanatory power of the model was determined as 0.769 and Likelihood value as 104.614.

According to the results of the logit model shown in Table 2, the variables EGTM, ESCLSMD, ABS, KEFYTUCZ were found statistically significant at level of 1%. And the variable G was found statistically significant at 5%. Sex, age and marital status were not found statistically significant.

Table 1 Starter model variables

Brief affirmation of variable	Scale	Descriptions of variable
KETM (Quantity of red meat consumption)	Discontinuous	Yes=1 (if a person consumes red meat 12 kg and above annually), No=0 (if a person consumes red meat 12 kg and less annually),
CNS (Gender)	Discontinuous	1=boy, 0=girl
Yas (Age)	Discontinuous	1=18-25, 2=26-30, 3=31-40, 4=41-50, 5=51-60, 6=60 ⁺
MH (Marital Status)	Discontinuous	1= Married, 2= Single, 3= Divorced
EGTM (Educational Status)	Discontinuous	1= Illiterate, 2= Literate, 3= Elementary school, 4= Secondary school, 5= High school, 6= University, 7= Master degree, 8= Doctoral degree
ESCLSM (Working Status of Spouse)	Discontinuous	Yes=1, No=0
ABS (Number of family members)	Continuous	Total number of individuals in the family in average
YB (Settlement Unit)	Discontinuous	1=Suburb, 2=Downtown, 3=Town-village,
G (Average monthly income of the family TL/month)	Discontinuous	1=0-1000, 2=1001-1500, 3=1501-2000, 4=2001-2500, 5=2501-3500, 6=3501 ⁺
MSLK (Profession)	Discontinuous	1=Civil servant, 2=Worker, 3=Self-employed, 4=Housewife, 5= Unemployed
AGHRCMS (Average monthly food expenditure TL/month)	Continuous	Average monthly food expenditure TL/month
KEFYTUCZ (Less expensive price of red meat)	Discontinuous	Yes=1, No=0

Table 2 The results of Logit model

	B	S.E.	Wald	DF	Sig.	Exp(B)
YS	0.073	0.213	0.12	1	0.73	1.076
CNS	0.13	0.571	0.052	1	0.82	1.138
MH	19.839	2.54	0.000	1	0.999	4.13
EGTM	0.679	0.254	7.126	1	0.008*	1.973
ESCLSM	2.101	0.599	12.305	1	0.000*	8.177
ABS	-0.69	0.195	12.556	1	0.000*	0.502
G	0.486	0.224	4.725	1	0.03**	1.626
KEFYTUCZ	4.806	0.652	54.286	1	0.000*	122.275

* Statistically significant at level of 1%, ** Statistically significant at level of 5%, B: Coefficient, S.E.: Standart Error, Wald: Wald Statistic, DF: Degree of freedom, Sig.: Significance level, Exp(B): Odds rate

In Table 2, EGTM variable coefficient was found positive and statistically significant at level of 1%. An increase in the education level by one unit increases possibility of increase in the quantity of red meat by the consumers by 1.973 times. When ESCLSM status increases, the quantity of red meat consumption by the consumer increases 8.177 times.

In Table 2, in the study, the variable G was found statistically significant at level of 5%. Coefficient of the variable G took positive value. When the monthly income of the family increases, the quantity of red meat also increases. Increase in the family income by one unit increases the quantity of red meat consumption 1.626 times.

Out of the variable in the model, it was also studied whether the variable number of individuals in the family had an effective variable on KETM. The study found the variable ABS as statistically meaningful at level of 1%. Odds ratio of ABS variable is 0.502 and it is necessary to use correction factor to remark. Odds ratio should be corrected as 1/Odds. The corrected Odds ratio is 1/0.502=1.992. Coefficient of the variable is negative. Accordingly, the increase in the ABS variable affects

KETM negatively. It was found that when number of individuals in the family increases, KETM decreases. The reason is considered to have arisen from the high price of the red meat.

In Table 2, KEFYTUCZ variable was found statistically significant at level of 1%. Coefficient of KEFYTUCZ variable took positive value. A decrease in the price of red meat by one unit increases quantity of red meat consumption 122.275 times.

Conclusion

Objective of the study was to determine the factors effective on the quantity of red meat consumption. It was determined that all consumers consumed red meat. Annual quantity of red meat consumption by the consumers was found 34.22 kg.

The study showed that the consumers preferred purchasing red meat from the butchers. The consumers most preferred beef as red meat. And the consumers preferred red meat due to the following reasons: most nutritious, healthy, delicious, habit and easy accessibility.

In the study, the quantity of red meat consumption by the consumers was examined and the factors that affect

change in the quantity of red meat consumption were analysed by help of logit model. According to the results of the model, the variables affecting quantity of red meat consumption by the consumers were found as EGTM, ESCLSM, G, ABS, KEFYTUCZ. The increased level of education of the consumers increases consumption of red meat as well. It is considered that as the educated people have higher awareness about healthy nutrition, they consume red meat more. And it was determined that those married with an employed spouse consume more red meat. And, on the other hand, the increased income results in consumption of red meat more. And the increased number of individuals in the family decreases consumption of red meat. We may associate it with the high price of the meat. Furthermore, it was also found out that the consumers consume red meat more when the price of red meat is cheaper.

For a healthy and quality society, balanced diet is significant. For this reason, training programs should be organized by the public organizations in charge of red meat and non-governmental organizations and the consumers should be encouraged for healthy and conscious nutrition.

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