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Factors Affecting the Domestic and Imported Cattle Meat Consumption Probability of Consumers in Turkey

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ABSTRACT

The purpose of this study was to determine the socio-economic and intellectual factors affecting the imported meat preferences of consumers and to reveal the personal prioritized preferences of buyers consuming domestic meat and imported meat. The study was carried out in Izmir, the third city of Turkey, where face-to-face interviews were conducted in 300householdswhose occupants shop at hypermarkets where domestic and imported meat is sold. 28.7% of those participating in the study prefer imported meat. As a result of logistic regression, the approach related to the share of cattle meat in the total meat spend, the age factor and the belief that the price of imported cattle meat is low positively affect the probability of consuming imported meat. The consumption of chicken and lamb and marital status has negative effects. The religious belief factor and the perception of taste in those consuming imported meat take priority in the personal preferences of domestic meat consumers. Long-term policies that will ensure stability in the market as a whole are needed in the livestock sector in Turkey. Improvement of meat quality, classification and the rising awareness of consumers regarding quality and farming according to nutritional requirements and the development of certification also have significant importance.

Keywords: Cattle meat, Consumer preferences, Imported cattle meat, Logistic regression, Turkey.

INTRODUCTION

The average meat consumption per person in the world was 33.7 kg in 2013, 65 kg in developed countries and 25.9 kg in developing countries (OECD-FAO, 2013). According to FAO data, while the world consumption average of animal protein is 31 g/cap/day, this amount is 29 g cap^{-1} d^{-1} in Turkey and the consumption of winged meat is around 21 kg. The share of Turkey in world production is 0.86% in cattle and buffalo meat, 2.2% in lamb and goat meat and 1.6% in winged meat (FAO, 2014). In Turkey, it was declared by the government that the price of meat raised too much in 2010-2012 and the import of livestock and meat began. In the period 2010-2012, the livestock import value increased as much as 22 times more than the average in three years, the export value decreased by 0.5 times. While the meat and offal import value increased 330 times, the export value increased four times (TÜİK, 2014). In the import of livestock (cattle), while Uruguay, Hungary, Australia and France have significant market share, Poland, Germany, France, Latvia and Italy have also attained significant shares in meat imports (TÜİK, 2014).

When international studies related to preferences for domestic and imported red

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meat for the current period are examined, it is noticeable that studies related to cattle meat are in the majority. In a study conducted in Louisiana in the USA (Schupp and Gillespie, 2001), the attitudes of consumers towards the country of origin labels in fresh and frozen cattle meat were examined and it was determined that consumers prefer domestic cattle meat instead of imported meat in restaurants and shopping malls. It was detected that in America, the perception that the safety and quality of domestic meat are higher is dominant among consumers and for this reason; consumers prefer to pay for domestic meat instead of imported (Umberger, 2004). However, it was also stated that some consumers may make their selections according to the feeding certificates of the cattle, relying on Certified US corn-fed beef or Certified Australian grass-fed beef, and for this reason, they request meat from other countries (Umberger *et al.,* 2001). In the studies carried out in Europe it was determined that the origin of meat increases the trust of consumers (Vukasovič, 2009).In a study conducted in England, consumer preferences for domestic meat over imported meat were examined and it was determined that most consumers prefer domestic meat. The perception of patriotism is thought to be important in their probability of preferring domestic meat (Meas, 2014). Together with this, in a study conducted in London, Frankfurt and Paris (Glynn *et al.,* 2003), it was determined that consumers prefer beefsteak certified to be without GMO and hormones by the USDA instead of their own domestic steak in London and Frankfurt. In Paris, consumers prefer respectively those of domestic origin but with labels, beefsteaks certified to be without GMO and hormones by the USDA and typical domestic beefsteaks. In studies conducted in Chile, it was detected that consumers give priority to the country of origin in cattle meat, and the slaughtering and presentation of the meat, health of the animal, price and brand come after this criterion (Schnettler *et al.,* 2008; Schnettler *et al.*,2014). In the lamb meat preferences of consumers in Albania (Imami *et al*., 2011), when the origin, price, weight and food safety of the meat are taken into consideration, it was determined that there is more acceptance of paying higher prices for meat of domestic origin. In another study conducted in Italy and Norway, it was determined that consumers prefer the meat of lambs that had grazed in mountain meadows and domestic lamb meat more (Hersleth *et al.,* 2012). In a study conducted in the USA on goat meat, it was determined that consumers are prepared to pay $1.50 more for fresh goat meat instead of imported meat; however, they pay attention respectively to the slaughtering of the meat (cube, chop steak, full carcass, semi-carcass) and after that the source of the meat (fresh domestic, frozen domestic, imported) (Hill, 2013). In a study conducted in Malaysia, attention was drawn to the fact that 77% of consumers prefer domestic goat meat (Kaur, 2010). In the studies carried out for the consumption of poultry meat inMiddle and South-Eastern Europe regions, it was determined that the origin of country plays an important role in the decision of purchase (Vukasovič, 2011; 2012). There is a strong belief that healthy and tasty meat is found in domestic products (Vukasovič, 2016).

There are lots of studies conducted on red meat consumption and the factors affecting it in Turkey (Karlı and Bilgiç, 2007; Karakuş *et al.,* 2008; Cankurt *et al.,* 2010; Şeker *et al.*,2011; Ergönül, 2011; Lorcu and Bolat, 2012a; Akçay and Vatansever, 2013). There are studies in limited numbers related to the import of red meat. In the study conducted by Cevger and Sakarya (2006), it was determined that the situation in which red meat was imported caused a decrease in domestic production in the years1976-1999 and had negative impacts such as the acceleration of price increases. In another study (Aydın *et al.,* 2011), red meat prices in the years1985-2010 were examined and the impact of entering 24% of red meat production into the market on prices together with the start of imports in Turkey

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were assessed in long-term and short-term. It was stated that ensuring stability in prices and stopping imports are only possible with policy precautions being taken in stockbreeding. In some studies, the status of stockbreeding and the impact of imports on the stockbreeders and prospective solutions have been given (Aydın *et al.*, 2010; Karakuş, 2011). Nonetheless, there are only two studies in Turkey searching for the preferences of consumers for domestic and imported meat. However, these studies were conducted in Turkey's eastern region; they don't represent the western region. This study has three main objectives,

-Revealing the existing status of consumers related to their probability of consuming domestic or imported cattle meat,

-Determining the economic, social and intellectual factors affecting consumers' probability of preferring imported cattle meat,

-Determining the priority order of the personal preference reasons of consumers consuming domestic meat or imported meat (such as taste, food safety, belief, Bovine Spongiform Encephalopathy (BSE) and revealing the factors that are most effective among these preference reasons.

According to these aims, behaviour in purchase of domestic and imported cattle meat in Turkey will be put forward. Apart from policy makers in Turkey, foreign firms which carry out business in different regions of the world will be used in the sense of marketing and new investments in the study results.

MATERIALS AND METHODS

Izmir, the city in which the study was conducted is the third largest city of Turkey and is a metropolis with a population of 4,061,000. It is in Western Turkey in the Aegean Region. In this study, red meat consumers shopping from hypermarkets were determined as the target audience. There are two main reasons for this situation; the first is that imported and domestic cattle meat could be labeled and sold in the same aisle. The fact that there is no labeling of imported or domestic meat in other small markets or butchers caused them to be out of the research scope. The second reason is that there is a permanently increasing interest in hypermarkets in Izmir. When the results of previously conducted studies were examined, the increase in income per person, the increase in owning cars resulting from this, the spread of the use of the credit cards and the increase in the urban population, the number of working women, technology and education levels had all increased the interest in such markets (Tosun and Hatırlı, 2009; Dursun and Azabaoğlu, 2008). With the spread of supermarkets and hypermarkets, ensuring the ease of purchasing all the needs of the customers in a single place has become the most significant reason of preference (Tosun and Hatırlı, 2009).When sampling was made by calculating that the total population (4,061,000) of Izmir is divided into households with at least three occupants, approximately 1,353,667 households were accepted as the main audience and the number of the householders to be within the study was accepted as 296 people with the confidence interval of 99% and error margin of 0.075($Z_{\alpha/2}$ σ_{px}= 0.075; σ_{px}= 0.075/2.58). 300 people were interviewed according to the proportional sampling given below (Newbold, 1995).

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

Where, *n*: Sample volume, *N*: Population, *p*: Number of houses (p ratio has been taken as 0.50 to be able to reach maximum sample volume), σ_{px}^2: Variance.

The socio-economic and intellectual factors affecting the imported meat consumption probability of the households were determined with the logistic regression model. The imported meat consumption status was used as the dependent variable. Within this scope, those consuming domestic meat, namely those not consuming imported meat, were taken as (0) and those

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consuming imported meat were taken as (1). The independent variables of the model are the gender and education level of the interviewed person (the respondent), marital status, state of work, household size, the amount of meat consumed in the house (amount of cattle meat, amount of lamb meat, amount of chicken meat), household income, the share spent on cattle meat in the total meat expenses of the household and the belief that the price of imported meat is lower when compared to domestic meat. Descriptive statistics related to independent variables are given in Table 1.

In the logit model, the dependent variable (z_i) expressing the natural logarithmic value of the ratio of selecting a certain option to not selecting is discrete and changes between the values of 0 and 1. Logit model is expressed as follows (Gujarati, 1995).

$$P_i = F(z_i) = F(\alpha + \beta X_i) =$$

Table 1. Descriptive statistics of the variables.

Dependent variable (Y)	Type of Variable	Description	Frequency	Percent (%)
	Dichotomus	0 Domestic meat con.		71.3
		1 Import meat con.		28.7
Independent variables (X)		Mean	st dev	-
Age of the respondent (AGE)		41.39	11.2490	-
Household size (HS)		3.11	1.193	-
The share spared for the cattle meat in the total meat expenses of the household (%) (ME)		50.4	5.29	-
Amount of Cattle Meat consumed kg (Monthly) (Household) (CM)		4.22	1.010	-
Amount of Chicken Meat consumed kg (Monthly) (Household) (CHM)		6.20	1.10	-
Amount of Lamb Meat consumed kg (Monthly) (LBM) (Household)	Dichotomus	0: No consumed	221	73.6
		1: Consumed	79	26.4
The Gender of the Respondent (GR)	Dichotomus	0 : Male	142	47.3
		1 : Female	158	52.7
Education level of the respondent (EDU)	Ordinal	1: Primary school	17	5.7
	Categorical	2: Secondary school	30	10.0
		3: High school	114	38.0
		4: University	139	46.3
Household Income (TL) (INCM)	Ordinal	1: x≤ 3999	83	27.7
	Categorical	2: 4000-6999	175	58.3
		3:7000- ≤ x	42	14.0
State of Work (Of the respondent) (WS)	Dichotomus	0: No	94	31.3
		1: Yes	206	68.7
Marital Status of the respondent (MS)	Dichotomus	0: Unmarried	64	21.3
		1: Married	236	78.7
Is the respondent the winnerat homemost revenue? (RW)	Dichotomus	0: No	138	46.0
		1: Yes	162	54.0
The belief that the price of the imported meat is lower when compared to the domestic meat (IMLP)	Categorical	1: No	28	9.4
		2: I don't know	170	56.5
		3: Yes	102	34.1

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$$\frac{1}{1+e^{-(zi)}} = \frac{1}{1+e^{-(\alpha+\beta X_i)}} \quad (1)$$

Where, P_i= The probability of i^{th} individual in selecting a certain option, f= Cumulative probability function, z= α+βXi, α= Fixed coefficient, β= The parameter to be estimated for each explanatory (independent) variable, X_i= i^{th} independent variable.

The following equation is attained by taking the natural logarithm of two sides of the equality above.

L=

ln

$$\left[\frac{P_i}{(1-P_i)}\right] = z_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots\ldots\ldots\ldots\ldots\ldots + \beta_n X_n \quad (2)$$

The hypotheses formed to test whether the model is important statistically are as follows.

H_0: The variables do not have any impact on the preference probability of the cattle meat as imported. H_1: At least one variable has an impact on the preference probability of the cattle meat as imported. According to the attained data, the model is generally meaningful at the level of P< 0.01. Given this situation, H_0 hypothesis has been rejected.

To test the goodness of fit in the logistic model, we examined whether it forms the high probabilities of the observed results according to the log likelihood. -LL and -2LL are desired to be small in the model. Hosmer and Lemeshow say that *Chi*-square goodness of fit test assesses the fitness of the logistic regression model as a whole and shows whether the model-data fit is at a sufficient level (Chi-square 4.007, P> 0.05). This value being meaningless shows that the model with two variables has an acceptable fit and the model estimations are not different from the observed situation (Garson, 2008, Cukur *et al.*, 2015). In the examined logistic regression, it was found with both tests that the logistic regression model is meaningful and the Odds ratios belonging to the model (the ratio of the realization number of an event to the unrealized number of that event) have been interpreted.

L=ln

$$\left[\frac{P_i}{(1-P_i)}\right] = z_i = \alpha + \beta_1 GR + \beta_2 AGE + \beta_3 MS + \beta_3 WS + \beta_5 RW + \beta_6 NH + \beta_7 ME \ldots\ldots + ui \quad (3)$$

The prioritized personal preference reasons of the respondents preferring domestic meat and imported meat in the study (factors such as perception of taste, food safety, belief and BSE) were additionally asked and the factors having distinguishing properties on these reasons were analyzed with *Chi*-square tests.

RESULTS AND DISCUSSION

In this study, 28.7% of the included households preferred imported cattle meat. The average age of the consumers is 41, the average number of household size is 3.11, the share of cattle meat expenses out of total meat expenses is 50.4%, the cattle meat consumptions of the household is 4.22 kg on average, their consumption of chicken meat is 6.20 kg and their consumption of lamb meat is 0.78 kg (only 79 houses consume and it is 1.48 kg on average). Consumption per person is 16.28 kg yr^{-1} in cattle meat and 23.92 kg yr^{-1} in chicken meat. 53% of the interviewed people are women. 46% of those participating in the questionnaire are graduates from university, 6% of them are graduates from primary school. The average income of 58% of the houses is between 4,000-6,999 TL. 34% of the surveyed people think that the prices of imported meat are lower than the prices of domestic meat, and 57% of them state that they do not know the prices of imported meat. According to the results of logistic regression (Table 2), age,

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Table 2. Results of the logistic regression model.

	B	*SE*	*Wald*	*df*	*Sig*	*Exp(B)*
GR	0.499	1.260	0.157	1	0.692	1.647
AGE	0.198	0.098	4.085	1	0.043*	1.219
MS	-7.659	2.906	6.945	1	0.008**	0.000
WS	-3.038	2.133	2.029	1	0.154	0.048
RW	1.155	1.323	0.762	1	0.383	3.173
NH	0.295	0.621	0.225	1	0.635	1.343
ME	0.170	0.073	5.404	1	0.020*	1.185
CM	0.395	0.532	0.552	1	0.458	1.485
LBM	-2.039	0.940	4.707	1	0.030*	0.130
IMLP	3.781	1.678	5.078	1	0.024*	14.858
CHM	-2.121	0.953	4.948	1	0.026*	0.120
INCM	.316	0.347	0.828	1	0.363	1.371
EDU	-1.286	1.843	0.487	1	0.485	0.276
Constant	-6.079	5.704	1.136	1	0.287	0.002
Variables in the Equation Model Summary	1.555	0.284	29.930	1	0.000	4.733
Model Summary	-2 Log likelihood 38.593(a)		Cox and Snell *R* Square 0.379		Nagelkerke *R* Square 0.628	

**Significant at $P< 0.01$, * Significant at $P< 0.05$.

marital status, the share of cattle meat expenses among all meat expenses, the belief that imported meat prices are low, and also the consumption of chicken meat and lamb meat, affect the consumption probability of imported cattle meat. The age factor, the share of the meat expenses among all food expenses and the increase in the belief that their price is low positively affect the probability of consuming imported meat. The consumption of chicken meat and lamb meat and the marital status affect negatively. The age factor increases the probability of imported meat consumption 1.2 times, the increase in the share of cattle meat expenses among the total meat expenses increases it 1.1 times and the increase in the belief that the prices of imported meat are lower increases it approximately 14.8 times. The consumption of lamb meat decreases the probability of imported meat consumption 7.69 times and the consumption of chicken meat decreases it 8.33 times. In addition, these findings reveal that in Izmir where cattle meat is especially consumed, consumers prefer lamb and chicken cuts that are cheaper compared to cattle meat instead of consuming imported meat. In the study conducted in the city of Tokat (Karabaş, 2013), it was determined that the fact that the price of imported red meat is low increases the consumers' probability of consuming imported animal products 4.13 times and, contrary to the results of this study, the consumption of chicken meat does not affect the probability of consuming imported red meat.

In this study, while the ratio of those preferring imported meat was 28.7%, it was 24.4% in a study conducted in the city of Erzurum (Kızıloğlu and Kızıloğlu, 2013). The results of two studies conducted in Izmir in the West of Turkey and in Erzurum in the Eastern Anatolian Region of Turkey show that the probability of preference for imported meat is too low when compared to domestic meat. As has been detected in the studies of many countries, consumers generally prefer red meat products with the domestic label of origin (Schupp and

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Gillespie, 2001; Umberger, 2004; Schnettler *et al.*,2014; Imami *et al.*, 2011; Hill, 2013; Kaur, 2010; Kızıloğlu and Kızıloğlu, 2013). In the study carried out for poultry meat in Slovenia, origin is the primary reason of preference of consumers among other factors (quality, safety, use by date, taste and price) (Vukasovič, 2009).However, consumers may prefer meat certified as fed by green-grass or which is without GMO or hormonesinstead of domestic meat (Umberger, 2001; Glynn *et al.*,2003).Respectively, the perception that imported meat is tasty (39.5%), has a low price (29%), the idea that there is no difference between domestic meat and imported meat (18.6%) and the fact that they find imported meat of better quality and healthier (12.8%) have taken place in the sequencing of those consuming imported meat. When the reasons for preferring imported meat and the educational level are examined, it was determined that there is a statisticaldifference (Pearson Chi-Square, 19.747, P< 0.05). It is noticeable that all of those graduated from primary school (100%) and 60% of those graduated from secondary school prefer imported meat because the prices of imported meat are low. Also, a statistical difference was found between the income groups and reasons for preferring imported meat (Pearson Chi-Square, 22.174 P< 0.01). However, while the reason behind imported red meat consumption of 60% of the households in the first income group, namely with income up to 3,000 TL, is finding the price cheap, the reason has a share of only 9% in the high income group. In the high income group, imported meat being healthy withhigh quality are among the priorities of 36.4% and the taste of imported meat is among the priorities of 36.4%. In the study conducted in the city of Erzurum (Kızıloğlu and Kızıloğlu, 2013), it was determined that the preference for imported meat decreases as the income level increases.

In addition, in the same study, 15.33% of the participants have stated that whether the meat is imported or domestic is not important to them. According to the findings of this study, the reason of 18.6% of those consuming imported meat is the idea that it does not have any difference from domestic meat.74.4% of the imported meat consumers have stated that their consumption of meat has not increased after starting to consume imported meat. However, there is a statistical difference among the group thinking that the price of imported meat is low, the group thinking that it is not low and the group stating that they do not know the prices (Pearson Chi-Square, 9.597, P< 0.01). While approximately 45% of the group thinking that the price of the meat is low state that meat consumption has increased, approximately 12-15% of the households in the other group have stated that their consumption of meat has increased.

In their priorities, the reasons for the buyers consuming domestic meat instead of imported meat are the fact that Muslim conditions are applied in domestic meat (43.7%), the perception that domestic meat is tastier when compared to imported meat (22.1%), the idea that there is little price difference between imported and domestic meat (1.4%), the idea that domestic meat is healthier with a higher quality (16.4%), and the fact that there is no Bovine Spongiform Encephalopathy (BSE) in domestic meat (16.4%) according to the order of priority.

CONCLUSIONS

The preference for imported cattle meat is generally low in the city of Izmir. However, it is noticeable that the consumption of imported meat may increase due to the fact that the price of imported meat is significantly lower than the price of domestic meat. In the preferences for domestic meat in the city of Izmir, the ratio of those showing the religious belief factor as the priority among the total consumer participants is 32% and their share among those preferring domestic meat is 43.7%. Moreover, for consumers preferring domestic meat there is the perception that imported meat is unhealthy and of lower quality and there

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may be BSE in the meat.. In the city of Izmir, it is evident that the perceptions related to the factors except for the religious factor that is leading the preference reasons of the domestic meat consumers may change to the advantage of the importer countries by means of their promotions related to quality and hygiene, that they are without GMO and hormones and are organic and healthy. Cattle-raising in Turkey leans towards milk breeds or combined efficient breeds and the carcass weights are lower when compared to the meat breeds. The policies or negative events applied in dairy farming also directly affect stock farming. This situation shows that the applied policies should be handled together. On the other hand, serious inspections are necessary related to animal diseases and the quality of meat in Turkey. In this issue, animal breeders should be trained and at the same time the product range should be developed with breeding that is certified according to the eating preferences of consumers. Raising awareness in consumers related to the quality of the meat also has significant importance.

Apart from this, the subject provides important contributions in the sense of meat marketing and meat consumption behaviours in scientific fields. Comprehending behaviour of Turkish consumers could enable removing problems in meat market. This study is restricted with domestic and imported cattle meat. In the future it would be interesting to carry out simultaneous studies with other types of meat and focus on perceptional characteristics of individuals.

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عوامل موثر بر احتمال مصرف گوشت گاو داخلی و وارداتی در مصرف کنندگان ترکیه

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چکیده

هدف از این مطالعه تعیین عوامل اجتماعی-اقتصادی و روانی موثر بر ترجیح مصرف گوشت وارداتی ونشان دادن عوامل ترجیح دادن هر یک از این دو محصول می باشد. مطالعات در Izmir، سومین شهر ترکیه و با ۳۰۰ مصاحبه حضوری از خانواده هاییانجام شد که خریدهای خود را از هایپرمارکت های دارای گوشت داخلی و وارداتی می کنند، ۲۸.۷٪ این افراد گوشت وارداتی را ترجیح می دادند. در نتیجه رگرسیون لجستیک نشان داد که درصد نسبت گوشت گاو در کل گوشت، سن و قیمت مناسب از عوامل تاثیر گذار مثبت بر مصرف گوشت های وارداتی است. مصرف مرغ و گوسفند و وضعیت تاهل خانواده، دارای اثرات منفی هستند. عامل باور دینی و درک و سلیقه در طعم و مزه نیز از عوامل ترجیح در مصرف کنندگان گوشت های وارداتی نسبت به گوشت های داخلی است. سیاست های طولانی مدت در ترکیه در بخش دام که تضمین کننده پایداری در بازار به عنوان یک کل شود، مورد نیاز است. بهبود کیفیت گوشت، طبقه بندی و افزایش آگاهی مصرف کنندگان در مورد کیفیت و کشاورزی با توجه به نیازهای غذایی و توسعه گواهی نامه ها نیز اهمیت قابل توجهی دارد.

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