

THE LIKELIHOOD OF SHEEP MEAT CONSUMPTION IN TURKEY

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ABSTRACT

The aims of this study are threefold: first, to determine the factors affecting the likelihood of sheep meat consumption; second, to determine the reasons for consumers' preferences; and third, to determine consumers' willingness to pay for quality-based labelling. The study conducted interviews with 300 households in Izmir province. According to the results of logistic regression analysis, gender, level of income, number of people in the household, beef consumption, and whether the interviewed individual has the highest income in his or her household affect the probability of sheep meat consumption. While the personal preferences of regular sheep meat consumers vary according to their red meat consumption, willingness to pay based on labelling is \$1.62/kg.

Keywords: consumer preferences, logistic regression, sheep meat consumption, willingness to pay

1. INTRODUCTION

According to OECD reports, worldwide consumption of sheep meat is increasing. In the year 2023, average world consumption of sheep meat per capita is expected to reach 1.91 kg, an increase of 12.3% compared to 2014 (OECD, 2015). Recently conducted studies also indicate that consumer demands for different types of meat are changing (BERNUÉS *et al.*, 2012, MONTOSI *et al.*, 2013). In particular, factors such as the relationship between red meat and cancer (NORAT *et al.*, 2002; CHAO *et al.*, 2005), an increase in other health-related concerns, changes in demographic structure, economic growth, and changes in meat's price, quality and image have been effective in driving this change (BERNABÉU and TENDERO, 2005; GRUNERT, 2006). The negative effect of red meat consumption on cardiovascular health and the recommended diet to maintain a healthy lifestyle are among the important factors affecting the preferences of consumers, especially in developed countries (LICHTENSTEIN *et al.*, 2006, DANIEL *et al.*, 2010).

There have been several studies of the factors that affect consumer preferences and willingness to pay for sheep meat (GRACIA *et al.* 2011). While some studies examine factors such as price, origin, certification, meat type and size, and feeding method (grain-fed, grass-fed and grain + grass fed) (SAÑUDO *et al.*, 2007; FONT I FURNOLS *et al.*, 2011; JOY *et al.*, 2012; BERNUÉS *et al.*, 2012), others primarily focus on the effects of factors such as the environment, animal welfare and food safety (DICKINSON *et al.*, 2003; NAPOLITANO *et al.*, 2007; NAPOLITANO, 2009; SEPÚLVEDA *et al.*, 2011). The results of these studies indicate that origin is a significant factor in meat consumption preferences; in particular, local meat is preferred (KAUR, 2010; FOINT I FURNOLS *et al.*, 2011; MEAS, 2014). In addition, studies concerning sheep meat consumption generally observe that origin is an essential factor in preferences and that consumers' willingness to pay is highly affected by the meat's origin (IMAMI *et al.*, 2011; GRACIA, *et al.*, 2011; HERSLETH *et al.*, 2012; MONTOSI *et al.*, 2013). However, BERNEUES *et al.* (2003) determined that, with regard to lamb meat preferences in France and Spain, the attention paid to animal feeding systems may be a stronger factor than the origin of the meat. On the other hand, PRESCOTT *et al.* (2004) report that the peculiar fat and smell of sheep meat are important reasons why it is rarely or never preferred in some countries or regions. It should be further noted that the culture, habits and beliefs of some countries may also affect sheep meat consumption (BONNE and VERBEKE, 2006; FONT I FURNOLS *et al.*, 2006; NAKYINSIGE 2012; MONTOSI *et al.*, 2013). Because studies of consumer behaviours related to sheep meat – and the factors that affect these behaviours – are closely related to several disciplines, including psychology, sociology, agronomics, food science and medicine, several relevant studies can be found in the literature. Nevertheless, in comparison to the number of studies conducted on other types of meat, the number of studies focused on lamb/mutton is still relatively low.

Although studies concerning meat consumption in Turkey are available, a robust database containing the production and consumption figures of animal products at the national level is missing (MFAL, 2015). Nevertheless, it was announced by the Meat and Milk Foundation (UKON, 2013) that meat consumption per capita in 2013 was 32.5 kg, with 60% (19.4 kg) of that being poultry meat consumption, 35% (11.4 kg) being bovine consumption and 5% (1.7 kg) being ovine consumption. In Turkey, anaemia is observed in 29% of women and 30% of children younger than 5 years. Annual per capita consumption of red meat in Turkey (29 g) is below the world average (31 g) (FAO, 2014).

There have been several studies of red meat consumption in Turkey and the factors that affect it (ATAY *et al.*, 2004; KARAKUŞ *et al.*, 2008; KAYA *et al.*, 2011; TÜZEMEN, 2012; ERDOĞAN, 2013). However, no study could be found that specifically examines the factors directly affecting sheep meat consumption and consumer preferences. As

mentioned earlier, off-the-book ovine breeding in Turkey and the fact that agricultural policy implementers are discussing whether the consumption gap in red meat can be closed with ovine meat not only require studies of production potential but also require that meat consumption amounts and consumer preferences be researched at both the regional and provincial levels. In this context, the main objectives of this study fall into two categories: first, to determine meat consumption patterns in the province of Izmir and to identify the socio-economic factors that affect the possibility of households' sheep meat consumption, and second, to identify personal reasons for preferring sheep meat among those who consume lamb regularly and to determine their willingness-to-pay based on quality-related labelling.

2. MATERIALS AND METHODS

The metropolis of Izmir is Turkey's third largest province, with a population of 4,061,000. The average household has three members (TSI, 2014). In this context, the population of the study was set to 1,353,667 households. The number of households to be included within the scope of the study was calculated as 296 according to the proportional sampling method (NEWBOLD, 1995, equation 1). Considering proportional losses based on the population's distribution among districts, interviews with a total of 300 respondents were completed.

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

where n is the sample size, N is the population size (1,353,667), and p is the prediction rate (0.5 for the maximum sample size) and the probability level confidence interval (99% confidence interval, σ_p : 0.02960 for 0.075 margin of error from the equation of $2.58\sigma_p$: 0.075).

A total of four districts in Izmir with high population densities were included within the scope. Accordingly, the sample size, determined as 300 people, was distributed per the respective populations of the districts. Thus, 151 people from the Balçova district, 76 people from the Karsiyaka district, 46 people from the Konak district and 27 people from the Menemen district were included in the sample. Because meat variety in hypermarkets is high, the survey was conducted among consumers who shop at hypermarkets in the research area. Moreover, the consumers participating in the survey were always responsible for shopping for their households. The questionnaire used for data collection included four main sections: (a) socio-economical characteristics of respondents (b) meat consumption of the households (c) the reasons for consumers' preferences (the reasons why consumers prefer sheep meat / the reasons for do not regularly consume sheep meat) (d) willingness to pay for a labelled product. In sections a and b, respondents were asked their age as well as open-ended questions regarding their education level, household, district, occupation, marital status, and amount of meat consumed in their household. However, income groups were divided into three categories to encourage the respondents to answer without hesitation. The scale was determined by the Turkish Statistical Institute's classifications. Therefore, the lowest income category included families of four with incomes at or below the poverty line (\$2270). Queries regarding consumer preferences consisted of multiple choice questions. Respondents were asked to select the most appropriate option. Finally, because there are no labelling or certification systems used for

sheep meat in Turkey, we attempted to determine whether consumers would be willing to pay a higher price for labelled (thus quality-assured) sheep meat. In this respect, sheep meat consumers were informed of the importance of labelling, and their willingness to pay for labelled meat was assessed. In this context, consumers in İzmir were told the average current price of sheep meat (\$15.71) and were asked whether they would pay extra for labelling. If the answer was positive, then they were asked to indicate the final price they were willing to pay.

In the present study, the factors that affect sheep meat consumption were determined by means of logistic regression analysis. As the dependent variable, while the respondents regularly consuming sheep meat were set as (1), those who do not regularly consume sheep meat were set as (0). In the logistic regression model, where the dependent variable has two categories, independent variables can be discrete, continuous and qualitative. The logistic regression model employed in this study is presented in equation 2.

$$\pi(x) = P(Y = 1 / X = x) = \frac{e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p}}{1 + e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p}} = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p)}} \quad (2)$$

where X is the data matrix with regard to the independent variable, and when X = x (when the value X is known), the probability of the occurrence is (Y=1) p. β is the constant, β_i is the parameter to be predicted for each explanatory (independent) variable, and X_i indicates the i^{th} independent variable.

The nonlinear logistic regression function given in the equation was subjected to logit conversion and linearized. Designing the model as per the data of the study produced the following equation,

$$g(x) = \ln \left[\frac{\pi(x)}{(1 - \pi(x))} \right] = \ln e^{\beta_0 + \beta_1 X} = \beta_0 + \beta_1 X \dots \quad (3)$$

where b_i indicates the variation in the dependent variable caused by 1 unit of change in the independent variable x, demonstrating how much change is caused by 1 unit of change in the x in the logistic model (ALDRICH and NELSON, 1984).

Within the scope of the study, the respondents' age, education, gender, marital status, employment status, household income, number of people in the household, whether the respondent contributes the highest income to the household, beef consumption of the household, chicken consumption of the household and whether there are any cardiac patients (family members taking medication) in the household were accepted as the independent variables (Table 1). The -2LLR value obtained for the model was 256.057, significant at a 5% margin of error (Table 2). With this value, the significance of the coefficients pertaining to the variable levels was tested.

In this study, the conditional valuation method is used. To apply this method, an imaginary market is created for a good or a service and people are asked how much they would pay in return for that good or service (CARSON, 2000). The price that consumers were willing to pay for labelled lamb/mutton products was determined by means of the lower bound mean method initially implemented by BLAINE *et al.* (2003).

$$LBM = \prod_0 (P_0) + \sum_{i=1}^k \prod_i (P_i - P_{i-1}) \quad (4)$$

where Π_0 is the cumulative percentage of willingness to pay, P_0 is the lowest payment boundary and K is the number of boundaries.

Table 1. Variables used in logit model and descriptive statistics of the variables.

| Dependent variable (Y) | Type of Variable | Description | Frequency | Percent(%) |
|--|------------------|----------------------|-------------|------------|
| | Dichotomus | 0 | 221 | 73.67 |
| | | 1 | 79 | 26.33 |
| Independent variables (X) | | Mean | Standard d. | |
| The respondents' age (AGE) | | 41.39 | 11.2490 | - |
| Number of people in the household (HS) | | 3.11 | 1.193 | - |
| Beef consumption of the household kg (Monthly) (BC) | | 4.22 | 1.010 | - |
| Chicken consumption of the household kg (Monthly) (CC) | | 6.20 | 1.10 | - |
| Gender of the respondent (GEN) | Dichotomus | 0: Male | 142 | 47.3 |
| | | 1: Female | 158 | 52.7 |
| Education of the respondent (EDU) | Ordinal | 0: Otherwise | 161 | 53.7 |
| | Categorical | 1: University | 139 | 46.3 |
| Income level of the household (INCM) | Ordinal | 1: $x \leq \$2270$ | 83 | 27.7 |
| | Categorical | 2: $\$2271 - \3974 | 175 | 58.3 |
| | | 3: $x \geq \$3975$ | 42 | 14.0 |
| Employment status of the respondent (ES) | Dichotomus | 0: No | 94 | 31.3 |
| | | 1: Yes | 206 | 68.7 |
| Marital status of the respondent (MS) | Dichotomus | 0: Other | 64 | 21.3 |
| | | 1: Yes | 236 | 78.7 |
| Whether the respondent brings the highest income to the household (HINCM) | Dichotomus | 0: No | 138 | 46.0 |
| | | 1: Yes | 162 | 54.0 |
| Whether there are any cardiac patients (family members taking medication) in the household (PIH) | Dichotomus | 0: No | 239 | 79.2 |
| | | 1: Yes | 61 | 20.3 |

3. RESULTS AND DISCUSSIONS

3.1. Factors affecting the likelihood of sheep meat (lamb/mutton) consumption

Among all households included in the study, 26.3% consume sheep meat (lamb/ mutton). The average age of the respondents is 41, 78.7% are married, and the total income of 58.3% of the households is between \$2,271 and \$3,974 per month. A total of 46% of the participating consumers have bachelor's degrees, approximately 53% are women, 54% contribute the highest income to their households, and 69% are employed.

According to the results of the study, among the meat preferences of the households in Izmir, poultry, beef and sheep meat have shares of 55% (6.22 kg/month), 38% (4.22

kg/month) and 7% (0.78 kg/month), respectively. None of the families consumed goat meat. On the basis of the types of meat in question, the consumption average of the households is 43.21 kg/year, or 3.60 kg/month. The annual average consumption of red meat, on the other hand, is 27 kg. While beef constitutes 89% of red meat consumption, sheep meat constitutes 11%. The average consumption of the 79 households that regularly consume sheep meat is 1.48 kg/month (while the same average among all households included in the sample is 0.78 kg/month). While 36.7% of the families that regularly consume sheep meat prefer sheep meat to beef, 20.3% of them prefer to consume solely sheep meat. On the other hand, among the whole population included in the study, 5.3% prefer to consume only sheep meat.

Examining studies conducted in other provinces of Turkey demonstrates that consumption patterns in Aydin province, which is also within the Aegean Region (ATAY *et al.*, 2004), and Erzurum province, located in the Eastern Anatolia Region (KAYA *et al.*, 2011), are similar to the pattern in Izmir province. However, it is also noteworthy that sheep meat consumption increases toward the regions of Central Anatolia and Southeastern Anatolia (KARAKUS *et al.*, 2008; TUZEMEN, 2012). According to the findings of the present study conducted in the Izmir region, average annual sheep meat consumption per capita is approximately 3 kg in this province. Although above the world average according to OECD data, this level of consumption is still below the average for Turkey. Furthermore, while consumers in Izmir mostly prefer spring lamb meat, towards Southeastern Anatolia, mutton is preferred (ÖNENÇ and ÖZŞENOĞULLARI, 2009). Indeed, in the present study, 58% of sheep meat consumers in Izmir reported that they prefer lamb.

Comparing – in terms of income groups – the rate of households that regularly consume sheep meat to those that do not demonstrates that while the rate is 10.84% in the lowest income group ($x \leq \$2,270$), in the middle-income group ($\$2,271-\$3,974$) and the highest income group ($\$3,975 \leq x$) the rates are 33.14% and 28.4%, respectively. Quantitatively examining the relationship between income groups and consumption amounts demonstrates that 100% of the consumption in the lowest income group is 2 kg or lower. The rates of the households consuming 4 kg and less in the middle and the highest income groups, on the other hand, are 88% and 75%, respectively. The households that consume more than 4 kg have shares of 12% in the medium income group and 25% in the high income group. According to the results of Pearson's chi-squared test (37.329), the income groups and consumption amounts of the households were significant at the level of 0.01. In a study conducted by PEARCE (2013), the findings of previous studies concerning Australia, the USA, EU and UK were evaluated, and it was suggested that the number of lamb meat consumers is higher in the medium income group. The highest rate of regular sheep meat consumers, compared to those who do not consume sheep meat in Turkey (33.14%), is also found in the medium income group.

The rate of households consuming sheep meat in the districts of Bornova, Karsiyaka, Konak and Menemen, compared to the total number of households, varies between 25% and 28%. The results of Pearson's chi-squared test (0.126) indicate that there is no significant difference between the districts of Izmir and sheep meat consumption at the level of 0.05.

According to the results of the logistic regression model (Table 2), the respondent's gender, whether he or she contributes the highest income to the household, total income of the household, amount of beef consumption, and number of people in the household were determined to affect the likelihood of sheep meat consumption.

Table 2. Statistical results of logit model.

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|-------------------|-------------|----------------------|-----------|---------------------|---------------|
| AGE | 0.004 | 0.020 | 0.034 | 1 | 0.854 | 1.004 |
| GEN | -1.648 | 0.619 | 7.088 | 1 | 0.008* | 0.192 |
| EDU | -0.153 | 0.402 | 0.144 | 1 | 0.704 | 0.859 |
| MS | 0.086 | 0.522 | 0.027 | 1 | 0.870 | 1.090 |
| ES | 0.287 | 0.391 | 0.537 | 1 | 0.464 | 1.332 |
| HINCM | -2.005 | 0.646 | 9.624 | 1 | 0.002* | 0.135 |
| PIH | -0.471 | 0.459 | 1.053 | 1 | 0.305 | 0.625 |
| INCM | 1.505 | 0.365 | 16.969 | 1 | 0.000* | 4.503 |
| CC | -0.116 | 0.162 | 0.514 | 1 | 0.474 | 0.890 |
| BC | -1.316 | 0.233 | 31.770 | 1 | 0.000* | 0.268 |
| HS | 0.701 | 0.178 | 15.571 | 1 | 0.000* | 2.016 |
| Constant | 1.063 | 1.616 | 0.433 | 1 | .511 | 2.895 |
| | B | S.E. | Wald | df | Sig. | Exp(B) |
| Variables in the Equation Model Summary | -1.001 | 0.132 | 57.910 | 1 | 0.000* | 0.367 |
| Model Summary | -2 Log likelihood | | Cox & Snell R Square | | Nagelkerke R Square | |
| | 256.057(a) | | 0.254 | | 0.369 | |

Hosmer and Lemeshow Test: Chi-square 13,801, df 8, p(0.087>0.05).

Women's probability of consuming sheep meat is 80.8% (0.192-1) less than that of men. As a matter of fact, according to the conclusions of the study conducted by PRÄTTÄLÄ *et al.* (2006) in countries with different cultures and economies (Finland and Baltic countries), it was reported that, in general, women consume less meat than men, and they usually prefer to consume vegetables and fruits. In addition, other studies (KUBBERAD *et al.*, 2002; SANTOS and BOOTH, 1996; HUGHES, 1995) report that, in particular, younger women tend to consume mostly white meat. UREÑA *et al.* (2008) reported that women and men display different attitudes and behaviours in buying food; in terms of lifestyle, women have a more positive attitude toward buying organic food and men tend to pay higher prices for organic food.

Households with total incomes above \$3,975 are 350% (1- 4.503) more likely to consume sheep meat than households with total incomes of less than \$2,271. The likelihood of consuming sheep meat increases in line with the increasing income of the household. However, it is noteworthy that the likelihood decreases by 86.5% (0.135-1) when considering sheep meat consumption in terms of the person who contributes the highest income to the household (Table 2). Furthermore, SHIFLETT *et al.* (2007) reported that in the USA, income has a positive effect on lamb meat consumption per capita.

In May 2015, beef carcass and lamb carcass prices in Izmir were \$8.40/kg and \$8.22/kg, respectively (UKON, 2015). The average prices in hypermarkets, on the other hand, are \$15.35/kg for beef meat and \$15.72/kg for lamb meat, indicating that because the recent prices of beef and lamb/mutton are quite close to each other, factors other than price affect

consumers' preferences for red meat. A one-kilo decrease in beef consumption in a household in Izmir increases the likelihood of sheep meat consumption by 73% (0.268-1). In a study by BYRNE *et al.* (1993), pork prices were found to affect demand for lamb meat, while the prices of chicken and beef were determined to have no effect on sheep meat demand. Pork is not consumed in Turkey because of religious beliefs. Because there is no habit of consuming goat meat in Izmir, this increases the chance of beef and lamb/mutton being consumed as each other's substitutes.

The presence of one additional person in a household increases the likelihood of consuming sheep meat by 101.6% (1-2.016).

Educational status, age, whether there are any cardiac patients in the household, employment status and poultry consumption of the household do not affect sheep meat consumption in a statistically significant way. On the other hand, while chicken consumption, the existence of a cardiac patient in the household and having a bachelor's degree are negatively correlated with sheep meat consumption, the age of the consumer and his or her marital status are positively correlated with sheep meat consumption (Table 2). According to the findings of a study conducted by RUSSEL and COX (2004), the meat preferences of middle-aged and older individuals differ; in comparison to younger individuals, elders' perceptions of processed food, roasted chicken and lamb and pork chops are more positive. In addition, PEARCE (2013) examined the results of studies conducted in Australia and the USA, EU and UK and reached the generalization that consumers older than 35 consume more lamb meat. In the present study, grouping the respondents into two groups (those that are younger and older than 35) produced no statistically significant difference in terms of lamb/mutton consumption. The rates of sheep meat consumption in groups of people both younger than and older than 35 are fairly similar and are between 26% and 27%. According to the results of Pearson's chi-squared test (0.034), there is no significant difference between age and sheep meat consumption at 0.05. On the other hand, the total rate of sheep meat consumption among families that have members 25 years of age or younger is 64%; lamb/mutton is consumed in 30.7% of these households. In families in which all members are older than 25, the rate of sheep meat consumption is 18.5%. Thus, the results of Pearson's chi-squared test (5.313) were significant at 0.05. While the rate of families with members 55 years of age and older is 18% among all families, 26% of them regularly consume sheep meat. The results of Pearson's chi-squared test (0.006) were not significant at 0.05. Accordingly, it was determined that in Izmir, the rate of families that have young members and regularly consume sheep meat is 12.2% higher than families that also regularly consume sheep meat but do not have young members.

The marital status of consumers in Izmir was determined to have no statistically significant effect on sheep meat consumption (Table 2). While PRÄTTÄLÄ *et al.* (2006), similarly, could find no effect of marital status in Finland and Latvia on meat consumption, the authors determined that married people in Estonia and Lithuania consume meat more frequently.

3.2. Individual Reasons for sheep meat consumption

As for the reasons why consumers prefer sheep meat, they were under the impression that lamb/mutton is healthier (29.1%) because sheep in Turkey are mostly fed in pastures, and it is believed that sheep breeding requires less medicine than bovine breeding. They also noted that sheep meat is considered tastier (41.8%) and is preferred for reasons of habit (29.1%) However, when grouping sheep meat consumers on the basis of their red meat consumption (as beef-heavy red meat consumption, lamb/mutton-heavy red meat consumption and exclusively lamb/mutton consumption) significant differences among

the groups were determined. Thus, the results of Pearson's chi-squared test (20.453) were significant at 0.01. While the group that exclusively consumes sheep meat as its red meat prefers sheep meat because of the belief that it is healthier (62.5%), in the beef-heavy consumption group, the preference for consuming sheep meat is less related to the perception of it being healthier (14%). In a study conducted by FONT I FURNOLS *et al.* (2011), it was reported that the belief that lamb/mutton is healthier is based on the fact that feeding with fresh grass is healthier, more natural and more environmentally friendly than intensive pellet feeding. In addition, consumers' perception that sheep meat is healthier is based on the fact that sheep are fed in pastures. It is also reported that consumers prefer animals bred in highland pastures to those bred in lowland pastures (IMAMI *et al.*, 2011; HERSLETH *et al.*, 2012; MONTOSSI *et al.*, 2013).

Approximately 77% of the participating sheep meat consumers stated that choosing meat of domestic origin is important to them. In some studies, consumers that considered meat origin to be important were older; in addition, gender has a distinctive effect on purchasing decisions (VERBEKE *et al.*, 2000; FONT I FURNOLS *et al.* 2011). However, no significant difference among consumers' age group (young, middle-aged or older groups) in Izmir was found in terms of regular consumers' preferences for meat origin. The results of Pearson's chi-squared test (2.170) were significant at 0.05.

3.3. The respondents who do not regularly consume sheep meat

Consumers' reasons for not consuming sheep meat include the lack of appeal of the specific smell and taste of sheep meat (53%), the consideration that it is fattier than beef and therefore unhealthy (35%), and not having the habit of consuming it because their families did not consume sheep meat (12%). In addition, according to the findings of several studies (PRESCOTT *et al.*, 2001, PRESCOTT *et al.*, 2004), the lack of the habit of consuming sheep meat and mutton and the factor of taste are important in terms of consumer preferences; factors such as how the animals are fed and deodorization by using spices are also worth considering.

3.4. Willingness to pay for a labelled product

When the consumers who prefer sheep meat were asked how much their willingness to pay would increase if the lamb/mutton were sold with labels indicating its quality, some of the consumers (13 respondents, 16.45%) stated that the price of sheep meat was already too high and that they could not pay more. As for the extra amount the willing respondents would pay for labelled products, this was calculated as \$1.62/kg by means of Blaine's method, as presented in Equation 3 (Table 3). DICKINSON *et al.* (2003) determined that 35% of consumers in the USA and 37% of consumers in Canada would be willing to pay \$1.35 and \$1.85, respectively, for certification of meat traceability, animal welfare and advanced food safety and that the demographic characteristics of the consumers affect this willingness. LYFORD *et al.* (2010), on the other hand, reported that among consumers from Australia, Japan, the USA and Ireland, the willingness to pay for quality is highest in Japan; the willingness to pay is higher among consumers aged 25 to 35 in all four countries; and the effects of the other demographic variables are relatively lower. In a study conducted by SÁNCHEZ *et al.* (2001) in Spain, it was determined that while willingness to pay more for lamb is based on meat origin, for beef it depends on food quality.

Table 3. Willingness to pay and the lower bound mean (LBM)*

| Consumers (number) | Payment willingness TL/ kg | % | Cumulative percentage % |
|--------------------|----------------------------|--------|----------------------------|
| 1 | 8 | 1.52 | 1.52 |
| 2 | 7 | 3.03 | 4.55 |
| 6 | 6 | 9.09 | 13.64 |
| 9 | 5 | 13.64 | 27.28 |
| 13 | 4 | 19.70 | 46.98 |
| 15 | 3 | 22.73 | 69.71 |
| 15 | 2 | 22.73 | 92.42 |
| 5 | 1 | 7.58 | 100.00 |
| 66 | | 100.00 | LBM= TL3.56/kg (\$1.62/kg) |

*1 US\$ = 2.192 TL.

4. CONCLUSIONS

The present study addressed preferences and willingness-to-pay among sheep meat consumers. According to the findings of the study, the likelihood of consuming sheep meat in the Izmir province is affected by gender, level of income, number of people in the household, beef consumption and whether the respondent is the member who contributes the highest income to the household. According to the model results, household income positively affects the possibility of sheep meat consumption. On the other hand, when the three income groups were compared, it was determined that the highest sheep meat consumption ratio (33%) was in the middle-income group (\$2271– \$3974). In this context, we can recognize the importance of developing marketing strategies aimed specifically at high-income groups. As goat meat and pork are not consumed in Izmir, and the prices of sheep meat and beef have recently become very similar, it was determined that factors other than price affect consumer preferences related to red meat. However, if, from the perspective of consumers, parity between cattle meat and sheep meat develops on behalf of sheep meat, the demand for sheep meat among low-income groups will also increase. In this context, analyses of the effects of supply-increasing policies in sheep breeding can be tested by new studies.

One of the important findings of this study is that women negatively affect the possibility of sheep meat consumption. If women are to prefer sheep meat, it is important to disseminate information about the change in fat ratio in the meat according to different carcass sizes and different rations, and about the frequencies with which sheep are allowed to forage.

One of the most prevalent reasons for not consuming sheep meat regularly is dislike of its smell and taste. Companies should test different meat types in the market according to consumer preferences (spiced and sauced meat, different methods of feeding, etc.)

The results of this study showed that the majority of consumers are willing to pay more for meat that uses quality-based labelling. In this context, if companies develop standards according to quality and especially if this becomes a legal obligation consumption of sheep meat will increase.

In conclusion, the possibility of sheep meat consumption may increase in Izmir, which represents the Aegean region. However, it is also understood from these results that the

increase in the possibility of consumption depends on a series of precautions that must be taken during the production stage.

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