Consumer behaviors on food purchasing places: A case study of red meat consumption in Turkey

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ABSTRACT

This study aimed at doing an econometric analysis of red meat consumption patterns, socio-economic characteristics of the consumer and red meat purchasing places of the households living in the central district of Erzurum province. The results obtained through factor analysis were used as explanatory variables in multi-logit regression analysis. According to analysis results, it was observed that red meat purchase places, market, supermarket, and hypermarket had a negative relation with age and educational background with respect to butchers, the traditional place of purchase, market and supermarket had a positive relation with income of the consumer in comparison with butchers.

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INTRODUCTION

There has been a significant change in consumer preferences for the places of purchase depending on the developments in retail sector especially in the last two decades. Increase in car ownership, widespread use of credit cards, and increase in urban population, the number of working women, technology and level of education due to the increased per capita income have boosted the demand for high street stores. All of these developments have played a major role in changing the consumer preferences for food purchasing places and, therefore, those of red meat[17]. In recent years, the tendencies of the consumers regarding red meat purchasing places have shown a change from butchers, considered to be the traditional places of purchase, to supermarkets and hypermarkets. Among the reasons for this change in preferences are the spread of modern mar-

keting insights, increase in the consciousness about product and consumer health, the spread of self-service shopping and supermarkets, developments in packaging industry, increase in consumer dominance in the market, rising income levels, product diversification, rigorous attention to shelf life and conservation conditions of products, increase in the number of working members in the family especially those of working women and shortening shopping hours as a result of this, widespread use of credit cards, and mass shopping opportunities[1]. The change in the socio-economic structures of societies is also reflected in consumption patterns. In other words, the food culture of a society develops and changes under the influence of various factors such as geography, climate, agriculture, animal husbandry, industrialization and the spread of mass media[2,3,11].

This study aimed at doing an econometric analysis of red meat consumption patterns, socio-economic char-

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acteristics and red meat purchasing places of the households living in the urban area of Erzurum province by taking their socio-economic features into account.

Many researchers have analyzed factors affecting consumer preferences for place of food purchase and used logit regression.Quagrainie et al[19] using the multinomial nonlinear nested logit model the results have confirmed that factors such as the age of the consumer, income of the household and size of the family had important effect on red meat demand.

Resurreccion[20] focused on sensory aspects of consumer choices for meat and meat products. McEachern and Seaman[14] studied the logit modeling procedure and found that knowledge of underpinning standards was limited. Primary sources of meat were the major supermarket groups with a distinct bias towards older consumers among those who preferred to shop in small butcher shops. Attitudes towards producers were mainly positive but some consumers remained skeptical about producer behavior during hard times.

Yee et al.[22] focused on livestock farmers and investigate the causal relationship between the factors that determine consumer trust, regarding food safety and in turn their purchase likelihood. Pundo and Fraser[18] used discrete multinomial logit analysis models to study the probability of household cooking fuel choice, without analysis of the quantity consumed.. Kizilaslan et al[11] studied on factors influencing meat purchasing places. The multinomial logit model was used to measure the effect of the independent variables on the dependent variable. Tosun and Hatirli[17] investigated main socio-economic factors affecting red meat purchasing sources of households in Antalya. From the collected household survey data, a logit model was estimated. Results of the estimated model showed that all variables meat the expected sings. Moreover, except the income and price variables included in the model, the education level of head of household, distance to market, purchasing frequency, club membership, availability of using credit card, freshness of meat, were found statistically significant.. Kilic et. al.[9] studied on consumer characteristics associated with preferences toward fluid milk alternatives. In this study, using consumer survey data from Samsun province of Turkey and Multinomial Logit model, unpacked and packed fluid milk pre-ferences were analyzed. Kadanali et al.[10] used logit model in their study to analyze the effect of factors on the level of

place of red meat purchase. The aim of the paper by Cankurt et al.[4] was to explore the influential factors on beef consumption in Izmir. The data of the study were randomly obtained from the consumers by face to face interviews. Logistic regression analysis was used in the study.. Ergonul[6] studied meat consumption and buying behaviors of consumers living in Manisa city center, Turkey.

MATERIAL AND METHOD

This study used cross-sectional data obtained from one-to-one interviews with families dwelling in the urban area of Erzurum province in 2011. The proportional approach was used to determine a sample size which would best represent the universe of the study[15].

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

where n=sample size (79048)[16], N=population size, t=96 % (Table value: 1.96), d=error ratio (0.05), p=red meat consumption likelihood (0.50), q= likelihood of not consuming red meat (0.50)[21].

It was determined as a result of the sampling study that 287 households should be interviewed. Before the survey was carried out, the districts in the central county of Erzurum city were divided into three groups based on a low, medium and high income group scale so that the households to be interviewed could represent Erzurum province center best. In the study, the socio-economic factors affecting the red meat consumption and purchasing places of households in Erzurum city were analyzed using multinomial logit model. For this purpose, the place of red meat purchase (butcher, supermarket, and hypermarket) was chosen as dependent variable of the model.

In many research affecting consumers' red meat demands and sales point preferences, it is seen that age, training, size of the household, place of residence, status of the mother and income factors constitute key factors[11].

In this study, the independent variables of the model were as follows: age of the householder, educational background of the households, income and purchase frequency, price of red meat, purchase method, freshness, hygiene, cholesterol, dealer effect, membership card, marital status, and number of individuals. Some

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of the statistical data and definitions of the dependent and independent variables in the model are presented in TABLE 1.

Survey results revealed that households had more than two choices for place of red meat purchase: butcher, supermarket, delicatessen and hypermarket. If there are a finite number of choices greater than two, multinomial logit estimation is appropriate to analyze the effect of exogenous variables on choice.

TABLE 1 : The variables used in the model and some statistical indicators

Variables and their definitions Sample size (n=287)	Frequency	Percent	Mean
Place of purchase			2.49
Butcher=0	68	23.7	
Supermarket=1	83	28.9	
Delicatessen =2	47	16.4	
Hypermarket=3	89	31.0	
AGE (age group of the consumers)			2.35
18-30=1	32	11.1	
31-45=2	122	42.5	
46-+=3	133	46.3	
EB (Educational background)			2.76
Literate and primary school =0	64	22.3	
Secondary school =1	47	16.4	
High school =2	84	29.3	
University =3	76	26.5	
Post graduate=4	16	5.6	
IN (Income)			2.05
0-1000=1	78	27.2	
1001-2000=2	116	40.4	
2000-+=3	93	32.4	
HS (household size)			3.14
1-2=1	37	12.89	
3=2	55	19.16	
4=3	77	26.83	
5=4	67	23.35	
6+=5	51	17.77	
PF (Purchasing Frequency)			2.56
2-3 times a week =1	37	12.9	
Once a week=2	104	36.2	
Once a fortnight =3	94	32.8	
Once a month=4	52	18.1	
PR (Price)			0.58

Variables and their definitions Sample size (n=287)	Frequency	Percent	Mean
doesn't have an effect=0	121	42.2	
has an effect=1	166	57.8	
PM (Purchasing Method)			2.18
Cash=1	2	0.7	
Credit card=2	55	19.2	
Credit=3	123	42.9	
Other=4	107	37.3	
FG (effect of freshness on meat purchasing)			0.86
doesn't have an effect=0	41	14.3	
has an effect=1	246	85.7	
HG (effect of hygiene on meat purchasing)			0.52
doesn't have an effect=0	137	47.7	
has an effect=1	150	52.3	
CH (has cholesterol)			0.21
doesn't have an effect=0	227	79.1	
has an effect=1	60	20.9	
SI (effect of the seller's image on meat purchasing)			0.87
doesn't have an effect=0	37	12.9	
has an effect=1	250	87.1	
MC (Membership Card)			0.26
Not using=0	212	73.9	
using=1	75	26.1	
MS (Marital Status)			0.93
Single=0	26	9.1	
Married=1	257	89.5	
Divorced=2	2	0.7	

In this study, we followed a standard random utility model as its theoretical basis[7,13]. The households face a choice decision among products that is assumed to be generated from the household's utility maximization.

Multinomial logit equation is shown below:

Definition of Y: 0,1,....j. (Assuming Y response variable is a nominal variable with J category) defined as:

$$\log = \left(\frac{\Pi_{ij}}{n_i} \right) \beta_i \check{S}_i (i=1,2,3,\ldots,N; j=0,1,\ldots,J)$$

where π_{ij} ;P(Y=j|x) likelihood. This likelihood is

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$$\Pi_{ij} = \frac{\exp(\beta_j x_i)}{\sum\limits_{j=1}^{j} \exp(\beta_j x_i)}.$$ In this model, $\text{prob}(Y_i=j|x)$

$$= \frac{\exp(\beta_j x_i)}{1 + \sum\limits_{j=1}^{j} \exp(\beta_j x_i)}.$$ Where $J:2,\ldots,J-1$ and $i:1,\ldots,N$ [7]

$$U_{ij} = X_i^1 \beta_j + \varepsilon_{ij} \quad (i=1,2,3,\ldots,N;\ j=0,1,\ldots,J)$$

This research is exploratory in nature; there are a few previous researches to help in selecting exogenous variables that might have an effect on the choice of place of red meat purchase alternatives.

Multinomial logit regression is used when dependent variables are more than two, and nominal[8]. Multinomial logit model is used to measure the effect of independent variables on the dependent variable with no ranking simultaneously as a whole[8,12]. LIMDEP package programs were used to estimate the empirical model results.

RESULTS AND DISCUSSION

The households surveyed were divided into three groups in terms of average monthly income with the help of frequency distribution. The first income group involves families with 1.000 TL/month or less income, the second income group consists of families with 1.001-2000 TL/month income and the third income group is made up of families with 2001 TL/month or over income. It was determined that monthly average income per family in 287 families surveyed was 2.033 TL and that the total number of family members was 4.219. The average monthly income values for 1st, 2nd and 3rd income group families were found to be 746 TL, 1676 TL and 3,558 TL respectively. The share of the least income group in the total sample was 27.18 %, whereas that of the highest income group was 32.40 % (TABLE 2).

The frequency of red meat purchase in families surveyed was found to be more than once a week, once a

TABLE 2 : Distribution of income groups

Income groups	Income (TL/month)	The number of household	Share in the total (%)	Average monthly income per household (TL)	Total number of family members
Low	1000 and less	78	27.18	746	4.026
Medium	1001-2000	116	40.42	1.676	4.050
High	2001 and over	93	32.40	3.558	4.032
Total / mean		287	100.00	2.033	4.219

TABLE 3 : Places of consumers buying red meat

Income groups	Market		Supermarket		Butcher		Hypermarket	
	Frequency	%	Number	%	Number	%	Number	%
Low	6	7.69	6	7.69	17	21.79	47	60.26
Medium	36	31.03	26	22.41	30	25.86	38	32.76
High	41	44.09	19	20.43	21	22.58	27	29.03
Mean	27.67	28.92	17	17.77	22.67	23.68	37.33	39.03

*exceeds a total of 100 as responses had more than one choice

week, once a fortnight, and once a month with respect to family income levels. It was determined that, on average, 18.12% of the families purchased red meat once a month, 32.75 % once a fortnight, 36.24% once a week and 12.89% more than once a week. This revealed that families largely purchased red meat once a fortnight

TABLE 3 presents the places where families surveyed purchased red meat. It was also found out that, on average, 28.92% of the consumers purchased red

meat from market, 17.77 % from supermarket, 23.68 % from butcher and 39.03 % from hypermarket. It was determined that the consumers with the highest income largely purchased red meat from market (44.09 %), whereas the share of the market and supermarket in those with the least income was lower (7.69 %).

The results obtained from the Multinomial Logit model are given in TABLE 4. The model was statistically significant at the 1% level. The model was statistically significant in terms of the chi-squared

(136.0726) criteria. When the variables in the model were analyzed in terms of level of significance, it was observed that the price, form of purchase, hygiene, cholesterol and membership card variables were not statistically significant in any one of the models. Age and educational background variables had a significance level of 1 percent in 3 models. The effect on seller variable had a significance level 10% in the market model. The freshness variable had a significance level 10% and

TABLE 4 : Estimates of multinomial logit model

Variables	Market	Supermarket	Hypermarket
Constant	-0.96	-0.86	2.39
	(-0.59)	(-0.48)	(1.54)
AGE	-0.58***	-0.77***	-0.55***
	(-1.77)	(-2.15)	(-1.69)
EB	-0.45**	-0.51**	-0.52*
	(-2.24)	(-2.15)	(-2.51)
IN	1.36*	1.29*	-0.23
	(3.76)	(3.13)	(-0.68)
HS	0.17	-0.51*	-0.21
	(1.07)	(-2.74)	(-1.35)
PF	-0.28	0.14	0.15
	(-0.14)	(0.61)	(0.71)
PR	0.47	0.22	-0.13
	(1.27)	(0.52)	(-0.35)
PM	0.99	0.79*	0.31
	(0.36)	(2.37)	(1.09)
FG	0.21	0.14	0.66
	(0.41)	(0.24)	(1.23)
HG	0.12	-0.13	0.21
	(0.31)	(-0.30)	(0.55)
CH	1.10**	0.68	-0.93
	(2.37)	(1.25)	(-0.18)
SI	-0.80	-1.02	0.56
	(-1.34)	(-1.56)	(0.86)
MC	-0.40	0.55	-1.02**
	(-0.10)	(1.24)	(-2.30)
MS	0.12	0.95	-0.34
	(0.18)	(1.93)	(-0.52)
Chi-squared (X^2):			136.0726
Significance level:			0.000
Log likelihood function:			-322,0992
Rest. log likelihood:			-390,1355
Mc Fadden Pseudo (R^2)			0.175

*, **and *** indicate the significance level of 1 %, 5 % and 10 % respectively

purchasing frequency variable had a significance level 1% in the delicatessen-local market place model. Marital status variable had a significance level of 10 percent in the hypermarket-local market model. The income variable was found to be 1 percent meaningful in both models (market and Supermarket).

According to the results, age variable was among the factors affecting the preference of consumers for the place of meat purchase. The higher the value of the age variable, in other words, the older the consumer was, the lower the likelihood that the consumer would prefer butchers over the local market. In the study conducted by Resurreccion[11], it was stated that any changes in the demographical characteristics of the consumer might lead to important changes in the red meat demand. Also, research suggests that education, growth and demographic characteristics affect the number of food items demanded by consumers. Results obtained from the current study confirmed this view.

TABLE 5 : Estimated marginal probabilities

Variable	The place of red meat purchase			
	Butcher	**Market**	**Super market**	**Hyper market**
Constant	-0.74	-0.35	-0.18	0.60
AGE	0.12	-0.38	-0.53	-0.30
EB	0.97	-0.26	-0.24	-0.46
IN	-0.14	0.23	0.12	-0.22
HS	0.26	0.75	-0.68	-0.33
PF	-0.16	-0.24	0.14	0.26
PR	-0.38	0.97	0.14	-0.75
PM	-0.66	-0.41	0.89	0.18
FG	-0.73	-0.17	-0.21	0.11
HG	-0.19	0.13	-0.33	0.39
CH	-0.11	0.20	0.45	-0.14
SI	0.63	-0.16	-0.13	0.23
MC	0.58	0.49	0.12	-0.23
MS	-0.25	0.80	0.14	-0.12

Marginal probabilities obtained from the research results are given in TABLE 5. It is emphasized that marginal probability coefficients are the probabilities of changes in the places of purchasing resulting from one unit change in the variables.

When the age variable was increased one unit, there was a 0.38, 0.53 and 0.30 unit fall in the rate of preference for the others groups. Regarding red meat purchase places in Erzurum, it was understood that as the age increased, the tendency to purchase meat from

butcher, the traditional place of purchase, also increased.

When the education variable was raised one unit, likelihood of preference for local markets, delicatessen store and hypermarkets fell by 0.26, 0.24 and 0.46. Even though the education level of people got higher, they preferred to purchase meat from butcher, not giving up what they were used to.

When the income variable was increased one unit, there was a 0.23 and 0.12 unit rise in the rate of preference for the market and delicatessen store. These markets produce and sell meat in better organized and hygienic environments. Therefore, income may result from the meats sold under such conditions. As soon as the income level gets high tendency to go to supermarkets decreases. Tosun and Hatirli[17],emphasized that importance of price decreased when higher income levels. But butcher preferences increased in purchasing red meat because of thinking red meat freshness in butcher, habits of purchasing from butcher, distance of supermarket.

When the household size variable was raised one unit, there were a 0.68 and a 0.33 unit fall in the rate of preference for the delicatessen store and hypermarket, respectively. As the number of family members increased, butcher was preferred over delicatessen and hypermarket. Kizilaslan et al.[11],reported that the price of meat in the extended families is more important than compared with the nuclear families. Because in the extended families, both the meat consumption is higher and the price of the meat is important since income per capita is decreased. Therefore, purchasing meat from the hypermarkets is not preferred by the extended families.

When the purchasing method variable was raised one unit, there was a 0.89 unit rise in the rate of preference for the delicatessen store. When the cholesterol variable was raised one unit, there was a 0.20 unit rise in the rate of preference for the market. If a member of the family had cholesterol problem, market was preferred over butcher. When the membership card variable was raised one unit, there was a 0.23 unit fall in the rate of preference for the hypermarkets. That is, membership card is not attractive to people.

CONCLUSION

People whose income increases prefer more reli-

able and quality products. Therefore, interest in big shopping centers considered more reliable than ever is growing increasingly. In this study, econometric analysis was used, considering the socio-economic characteristics in the red meat consumption behaviors, families' socio-economic characteristics and preferences for the place of red meat purchase of households living in the urban area of Erzurum province.

It was determined that monthly average income per family in 287 families surveyed was 2.033 TL and that the total number of family members was 4.219. The average monthly income values for 1st, 2nd and 3rd income group families were found to be 746 TL, 1676 TL and 3,558 TL respectively. The share of the least income group in the total sample was 27.18 %, whereas that of the highest income group was 32.40 %.

The survey was conducted with 287 households. The households were divided into three groups in terms of average monthly income with the help of frequency distribution. It was determined in the survey conducted in the urban area of Erzurum province with 287 families that monthly average income per family in the sample surveyed was 2.033 TL and that the total number of family members was 4.219. With the highest share in educational background, 29.27 % of the householders were high school graduates. There was a relation between the educational background of the householders in families surveyed and income level (P<0.01). In addition, there was a significant relation between the income level of the consumers and the place of red meat purchase (market and hypermarket) (P<0.05). As the income level increased, people preferred to purchase meat from market. It was determined that there was a relation between butcher, the traditional place of purchase, and the level of income at 10 % confidence interval. This is an example that the people in Erzurum could not give up their habits completely regardless of their income level.

According to analysis results, it was observed that while, red meat purchase places, market, supermarket, and hypermarket had a negative relation with age and educational background with respect to butchers, the traditional place of purchase, market and supermarket had a positive relation with income in comparison with butchers.

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