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Determining the Meat Consumption Habits in Erzurum Province and the Factors Affecting the Case

[1]Tugba Erem Kaya, [2]Ayse Sezgin, [3]Hediye Kumbasaroglu and [1]Murat Kulekci
[1]The Department of Agricultural Economics, The Faculty of Agriculture,
Ataturk University, 25240 Erzurum, Turkey
[2]The Ministry of Agriculture and Rural Affairs, Erzurum Agricultural Directorate of Province,
Cemal Gursel Cad, 25100 Erzurum, Turkey
[3]The Ministry of Environment and Forestry, The Directorate of DSI VIII, Erzurum, Turkey

Abstract: This study aimed at determining the meat consumption habits in Erzurum province. To do this, a total of 150 questionnaires was conducted using unclustered one-stage simple random sampling method. The data obtained from the survey was analyzed using Ordered probit model to reveal the factors affecting the meat consumption habits of consumers. The findings suggested that 89.3% of the survey participants preferred meat and that 10.7% preferred white meat. It was determined that the most preferred type of meat was beef (86%), mutton (6%) and goat meat (0.7%), respectively. The form of consumption was 12% with vegetables, 8.7% grilled, 4% in oven. About 69.3% revealed no preference replying, it did not matter. It was found out that 41.3% of the meat consuming families consumed <3 kg of meat a month. According to the results of the survey, it was determined that the ratio of those who found the consumed meat delicious was 86% and that 14% found it tasteless. Meat consumption amount was taken as dependent variable in Ordered probit model analysis. According to the result of analysis, it was found that there was a significant and positive relationship between meat consumption and marital status, monthly income of consumers, popular meat type, hygiene conditions and balanced diet.

Key words: Consumption habit, Ordered probit model, meat, balanced diet, Erzurum, Turkey

INTRODUCTION

One of the most important requisites of a healthy and balanced diet is to meet 40-50% of the daily needed protein from animal sources (Gokalp, 1986; Gogus, 1986; Odabasioglu *et al*., 1995). Meat is more expensive than white meat (chicken and fish). Turkey (12 kg year^{-1}) is behind the USA (116.7 kg year^{-1}) and EU countries (62 kg year^{-1}) with respect to meat consumption per person.

There are some factors affecting the meat demand and consumption in our country. Some of these factors are income level of consumer, the price of meat and consumer preferences. In addition to this, it can be said that the socio-economic structure of the region is effective on consumer habits as well. Apart from efforts to increase meat production, determining the meat consumption habits of consumers also has great significance. As the population of our country increases rapidly, it is necessary to increase, improve and asses the food resources in the same way. Sufficient and balanced nutrition should be given necessary consideration to protect human health and grow healthy generations. With this respect, it will be possible to get better results by determining the consumption habits of people to discover how a balanced diet should be.

Erzurum province is one of the important settlements in the region. Moreover due to some reasons, migration of the village population to cities in recent years has increased the importance of Erzurum more; consequently, several economic and social problems have emerged. Especially, the rapid collapse of stockbreeding, the livelihood of the region in recent years has even increased the problems of the region, already in economic bottleneck. Depending on the gradual decrease of both sheep and cattle population, the deficit of animal protein has increased and this has perhaps become the most important of the problems. This study aimed at determining the factors affecting the meat consumption habits of consumers in Erzurum city. Meat consumption amounts of consumers were taken as consumption habit. Meat consumption amounts were classified into three

Corresponding Author: Ayse Sezgin, The Ministry of Agriculture and Rural Affairs, Erzurum Agricultural Directorate of Province, Cemal Gursel Cad , 25100 Erzurum, Turkey

categories in ascending order. Accordingly, the factors affecting the meat consumption of consumers were determined.

MATERIALS AND METHODS

A questionnaire form including 30 questions was designed to determine the meat consumption habits in the central counties of Erzurum province. The questionnaires were given to a total of 150 randomly selected people and families. The data obtained from the questionnaires was statistically analyzed in LIMPED standard software.

Sampling method: The sample size was determined using unclustered one-stage simple random sampling method (Sahin *et al*., 2001):

$$n = \frac{(t)^2}{(e)^2} \times (p \times q)$$

Where:

t = t table value matching 95% significance level (1, 96)
p = Likelihood of the mentioned case (the proportion of meat consuming families)
q = Unlikelihood of the mentioned case (the proportion of families not consuming meat)
e = Sampling error (0.05)

p and q values were assigned 0.89 and 0.11, respectively as 11 % of the cases in the pre-survey done to determine p and q values stated they did not consume meat. Accordingly, the following formula yielded the number of questionnaires as 150:

$$n = \frac{(t)^2}{(e)^2} \times (p \times q) ven = \frac{(1.96)^2}{(0.05)^2} \times (0.89 \times 0.11) = 150.44$$

Data analysis method: The data was analyzed in LIMPED standard software. The dependent variable in Ordered probit model was qualitative. In cases where dependent variable is categorical or ordinal, it is possible to use ordered logit or probit probability estimators. Ordered logit and probit models were originally used by Mckelvey and Zavoina (1975) in economy and finance fields. Both methods use maximum likelihood functions. While Ordered probit model is based on normal probability distribution, Ordered logit model is derived from standardized logistic probability distribution (Mckelvey and Zavoina, 1975). What distinguishes Ordered logit model from ordered probit model is that errors are distributed logistically. In this study, ordered logit model was not touched on as only Ordered probit model was used. Meat consumption was taken as an indication of meat consumption habits for Erzurum city in the study. The factors affecting this habit and their significance levels were determined. The functional form of Ordered probit model estimating the influence of the factors is as follows:

$$Y = (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12})$$

Where:

Y = The amount of meat consumption, 0: <3 kg, 1: 4-5 kg, 2: over 5 kg
X_1 = Place of residence (Aziziye, Palandoken, Yakutiye)
X_2 = Age of household head
X_3 = Marital status of household head
X_4 = Job of household head
X_5 = Education level of household head
X_6 = Total income of houshold
X_7 = Popular meat type
X_8 = The family's average monthly consumption expenditure
X_9 = The number of family members
X_{10} = Cholesterol state
X_{11} = Hygiene
X_{12} = The state of balanced nutrition

Meat consumption habits in Erzurum province: According to participant responses given to the questionnaires conducted to determine the meat consumption habits in Erzurum city, the gender distribution of the participants was 41.3% female and 58.7 male. Regarding the ages, 4% of the cases was 18-23, 20.7% was 24-30, 31.3% was 31-40, 22% was 41-50 and 22% was >51. Education level proportions of the cases were 0, 1.4, 33.3, 30, 23.3 and 12% for illiterate, literate, primary education, high school, university and post-graduate, respectively.

The proportions of profession distribution were 33.3, 24, 22.6 and 6.7% for officers, housewives, workers and self-employed, respectively. The rest included other job groups. As shown in Table 1, 89.3% of the survey participants preferred meat, 10% chicken and 0.7% preferred fish. About 59% of the meat consumers was male and 41% female. Regarding the hometowns of the consumers, 90.3% was from Erzurum and 9.7% was from other provinces. The income distribution of the consumers was 4.5% (<500), 20.2% (501-800), 18.6% (801-1000), 15.7% (1000-1500) and 41% (>1500) TL. About 40% of the meat consumers stated they consumed, it for reasons of taste, 31.4% believed its

Table 1: Results regarding meat consumption habits in central county of Erzurum province

Questions	Choices	Percentage
Popular meat type	Fish	0.7
	Chicken	10.0
	meat	89.3
Meat consumption preference	Not consuming	0.0
	Delicious	40.1
	Nutritious	31.4
	Easily available	0.0
	Habitual	25.3
	Other	5.2
Meat consumption frequency	Everyday	11.3
	1-3 times a week	43.3
	4-5 times a week	12.7
	Once a month	20.0
	2-4 times a month	12.0
	1-3 times a year	0.7
	Never	0.0
Meat type preference	Mutton	6.0
	Beef	86.0
	Goat meat	0.7
	All	7.3
Form of consumption	Boiled	3.3
	In oven	4.0
	Fried in oil	2.7
	Grilled	8.7
	With vegetables	12.0
	In any form	69.3
Place of purchase	Live animal	0.7
	Any butcher	21.3
	Supermarket	30.7
	A particular butcher	36.0
	Industrial complex	4.0
	From any place	7.3
Purchase criteria	Type of meat	14.0
	Freshness	59.3
	Price	25.3
	Packaging	0.0
	Other	1.4
Form of purchase	Carcass	0.0
	Portion	38.7
	Bony	0.7
	Minced	60.6
Which has more cholesterol	Red meat	95.3
	White meat	4.7
Monthly meat consumption	<3 kg	41.3
	4-5 kg	25.4
	Over 5 kg	33.3
Hygiene of the purchased meat	Yes	50.0
	No	50.0
Taste of the purchased meat	Yes	86.0
	No	14.0

nutritional value, 25.3% stated it was a habit and 5% reported they consumed it for other reasons. The most prefer meat type was beef (86%), mutton (9%) and goat meat (0.7%). 7.3% preferred all.

The answer to the question about the place of meat purchase was 36% from a particular butcher, 30.7% from a supermarket, 21.3% from any butcher, 4% from industrial complex and 7.3% from any place and 0.7% stated they bought live animals. About 59.3% of the cases stated freshness was their primary criterion for meat purchase. The responses to meat purchasing form were 60.6% minced meat, 38.7% portion meat and 0.7% bony meat (Table 1).

Two of the questions in the questionnaire were the amount of purchased meat and the frequency of meat consumption. Responses to the amount of purchased meat were 41.3% (<3 kg a month); 25.4% (4-5 kg a month) and 33.3% (>5 kg a month). The frequency of consumption received interesting responses. A majority of the participants (43.3%) stated they consumed meat 1-3 times a week; 12.7%, 4-5 times a week; 11.3%, daily; 20%, once a month; 12% 2-4 times a month and 0.7% 1-3 times a year. The responses to consumption type were 69.3% in any form; 12% with vegetables; 8.7% grilled; 2.7% fried in the pan; 4% in oven and 3.3% boiled.

As shown in Table 1, the question regarding which type of meat contained more cholesterol was responded as meat by 95.3% and white meat by 4.7%.

It was determined that 86% of the survey participants found the meat produced in Erzurum delicious and that 14% did not. In addition, it was found that meat consumptions of 56% of the participants did not change in comparison to that of previous year. According to the results, 5.3% of the cases constantly consumed meat based products (sausages, pastrami and salami), 46% consumed them occasionally and 48.7% never consumed them.

About 84.7% acknowledged that meat was necessary for a balanced diet however, 15.3% did not agree this. While 20.7% responded positively to tail fat consumption, 79.3% responded negatively to it. About 98% of the cases who responded yes to offal consumption answered live.

Analysis results for Ordered probit model: Meat consumption amounts of the consumers were divided into 3 groups and classified as 0 for <3 kg, 1 for 4-5 kg and 2 for >5 kg consumption. Meat consumption amount was taken as a dependent variable to indicate meat consumption habits of consumers. Ordered probit model was used to analyze the factors affecting the consumption habits. Results are shown in Table 2.

The likelihood hypothesis test, needed for the acceptability of model's overall statistical significance in meat consumption and for the expressiveness of the resulting equation is as follows:

$$LR = -2\,(LogLikelihood_{limited}) - (LogLikelihood_{unlimited})$$
$$LR = -2(-161,883) - (-85,764)$$
$$LR = 152,238$$

According to the test, LR value was bigger than the critical value of $\chi^2_{(8)}$: 21.03 at 95% significance level. That is the explanatory aspect of the estimated model was

Table 2: Analysis results for Ordered probit model

Variables	Factors	Standard Error	Marginal affects		
			Prob (y = 0)	Prob (y = 1)	Prob (y = 2)
Constant	-6.7987**	1.3121	-	-	-
Residence	-0.1433	0.1436	0.0538	-0.0241	-0.0297
Age	-0.2174	0.1205	0.0817	-0.0366	-0.0451
Marital status	1.4992*	0.6618	-0.5412	0.3639	0.1774
Job-dummy (officer: 1, others: 0)	0.1829	0.3111	-0.0679	0.0286	0.0393
Education status of householder	0.1741	0.1751	-0.0654	0.0293	0.0361
Monthly income	0.7825**	0.2206	-0.2940	0.1317	0.1623
Popular meat type	1.0201**	0.3842	-0.3894	0.2590	0.1304
Monthly average expenses on consumption	0.2329	0.1309	-0.0875	0.0392	0.0483
Number of family members	0.1163	0.1035	-0.0437	0.0196	0.0241
Cholesterol state	-0.3033	0.3836	0.1140	-0.0510	-0.0629
Hygiene conditions	0.6001*	0.2657	-0.2225	0.0975	0.1251
The state of balanced diet	1.2152**	0.3430	-0.4554	0.3011	0.1543
Threshold value (Mu)	1.4900**	0.2174	-	-	-

Model $\chi^2_{(12)} = 152.238$ (*) significant at 0.05, (**) significant at 0.01

accepted. The threshold value was statistically significant. When the results of regression analysis regarding meat consumption amount in Erzurum city, explained in twelve independent variables are examined, it can be seen that the factors of the parameters are significant.

The residences of the consumers were listed as Aziziye, Palandoken and Yakutiye. There was a negative relation between the place of residence and meat consumption with respect to this feature and it was found that the consumers residing in Aziziye consumed more meat. The relation between the place of residence and meat consumption did not yield a statistically significant result. Similarly, the relation between consumer age and job, the education status of the householder and meat consumption did not yield a statistically significant result, either. It was determined that the consumers who were officers consumed more meat than consumers of other jobs. It was also found that the relation between marital status and meat consumption was at 95% significance level and that the significance between monthly income and meat consumption was statistically significant at 99%. The study revealed that meat consumption increased as the consumer income increased. It was also determined that there was a 99% statistical significance between popular meat type and the consumption and that meat lovers consumed more meat.

It was found that meat consumption increased as monthly average expenses on consumption and the number of family members increased. However, these relations were not found to be statistically significant. Similarly, consumers who thought meat included excess cholesterol consumed less meat; therefore, this relation did not yield a statistically significant result, either. It was found that there was a 95% statistically significant relation between hygiene condition and meat consumption and that consumers who thought meat was processed under hygienic conditions and inspected by authorized personnel consumed more meat. The relation between balanced diet and meat consumption was statistically significant at 99%. Consumers who thought meat was necessary for a balanced diet consumed more meat. When the marginal affects of the variables which were statistically significant in ordered probit model were examined, it was found that marital status, monthly income and popular meat type, hygiene conditionFebruary 20, 2011 and balanced diet affected the increase in meat consumption 1.7, 1.6, 1.3, 1.2 and 1.5%, respectively.

RESULTS AND DISCUSSION

Erzurum is one of the important settlements in East Anatolian region. It was found that the rate of who consumed meat fondly in this city was 89.3%. The result is important. It is an already known fact that consumption habits vary from region to region.

In a study, conducted to determine meat consumption habits in Cine county of Aydin province (Atay *et al*., 2004), it was found that families participating in the study primarily preferred chicken (46.3%). The rate of meat preference by these families was 33.1%. A similar study conducted in central county of Van province yielded 38.3% for meat and 23.4 for chicken (Aygun *et al*., 2004).

In addition to this, it was found that 40% of the consumers in Erzurum preferred meat for its taste. The same variable yielded 23.4% in Van. The 16.6% difference between the two can be considered to result from education, culture, income and consumption patterns of the families. One of the most striking aspects of the survey results was that men in Erzurum (59%) preferred meat far more than women did (41%).

The results obtained from income level variable revealed that there was an interesting difference between the provinces. While income level was effective on meat consumption habits of participants in Erzurum, regardless of the differences between income levels of the three income groups in Gaziantep, meat was consumed in a ratio close to each other. On the other hand in Van city, these ratios increased and decreased in parallel to each other regarding income level. In Cine district of Aydin province, it was determined that meat type was effective on the difference obtained from meat consumption in income groups (Atay *et al*., 2004; Aygun *et al*., 2004).

Food proteins form the basis of nutrition. The formation of genetic structure, intelligence and somatic roof and the fulfillment of all biological functions is provided by proteins. For this reason, daily nutrition needs to have a certain amount of protein. A considerable amount (42%) of this protein should come from animal protein as it is necessary for mental and physical development and a healthy life. However, the rate of those who preferred meat for its nutritious value was only 31.4% in this study. It was found in the study that few participants (6%) preferred mutton. This ratio was low in comparison to other provinces. The participants stated that they did not prefer mutton because they did not like its smell; it caused digestive disorders; they were not accustomed to consuming it; it was hard and it was tasteless. The most preferred place of meat purchase in Erzurum was found to be a particular butcher (36%). The chance to buy any piece of the carcass, extraction of the meat nerves and presentation of the meat in accordance with demand play a big role in this result. Yildirim *et al*. (1998) reported that 82.5% of the families bought meat from butcher however as the income level of people increased they tended to buy from supermarkets. Another interesting result from the study was that though 95.3% of the participants stated meat contained more cholesterol, they could not give up their meat consumption habits. Therefore, it can be stated that Erzurum is not a conscious consumer community.

Demand is the most important of the factors determining production level. The demand for meat in our country has not reached a desired level yet. The following factors can be listed as reasons of the case: meat prices are high in comparison to consumers' incomes; consumption tendencies are directed to durable goods; level of consumer knowledge about the subject; insufficient organization about the market supply of meat and the like. Meat consumption habits are not the same as they used to be. In the past, fatty meat was preferred more but today lean meat is preferred. Beef was not consumed by the majority of people in the past but today it is preferred more as it is lean (Akcapinar *et al*., 1996). It was found in the study that beef was especially preferred as meat. It is thought that the number of integrated meat facilities should be increased depending on consumption amount and habits and the animals raised in the neighboring cities should be utilized in supplying meat appropriate for market and demand.

CONCLUSION

In this study, the results regarding factors affecting meat consumption habits of the consumers can be summarized as follows; it was found in the study that marital status, income, popular meat type, hygiene and balanced diet was effective on meat consumption and that they were statistically significant.

RECOMMENDATIONS

One of the basic requirements of a healthy society is a healthy diet. It is necessary that known to be important for a balanced diet, meat consumption amount should be raised to adequate levels and that effective extension and training programs should be organized to direct the consumers to healthy and conscious nutrition.

In addition, it can be emphasized that studies should be conducted to improve people's income level to help them have a healthy and balanced life. It is quite important to bring sanctions to assure maximum health and hygiene care in meat production and sale centers.

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