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Consumers' Meat and Products Consumption Frequency, Knowledge Levels and Quality Cues: The Sample of Aksehir, Turkey*

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Abstract: Meat contains a wide range of important dietary source of proteins and essential nutrients which provide a positive effect on human growth and development. The quality of meat and meat products differ from intrinsic and extrinsic cues so that it can be formed according to preferences of consumers. The aim of this study is to determine the consumer's consumption frequency, knowledge levels and opinion of quality cues of meat and meat products. The study was conducted as a cross-sectional, general survey model. The sample group of the study consisted of 402 consumers who were selected using easy randomized sampling method. The survey instrument consists of demographic characteristics, consumption frequencies, knowledge level and quality cues of meat and meat products of consumers. According to the results, the participants' once a week consumption frequencies of beef, mutton/lamb and goat meat were found 23.2, 5.2 and 1.0%, respectively and two-three times a week consumption frequencies of sucuk, pastrami, salami, sausage and braised meat were found 19.7, 1.2, 9.5 and 9.7%, respectively and 3.7% and significantly differences were determined between sucuk, sausage and braised meat ($p < 0.000$, $p < 0.05$, $p < 0.05$) consumption frequencies by gender. The quality cues findings were separated to intrinsic and extrinsic factors (Cronbach α : 0.892). No difference between intrinsic quality items was detected ($p > 0.05$), but extrinsic quality item scores were confirmed significantly differences by gender ($p < 0.000$). The mean ($\bar{x} \pm S$) of the meat and meat product knowledge scores was determined (62.15 ± 0.69) and the knowledge scores according to gender was determined significant ($F_{(400)}$: 7.455; $p = 0.000$).

Key words: Meat, meat products, consumption, knowledge, quality cues

INTRODUCTION

Meat provides a relatively rich source of well absorbed iron and also improves the absorption of iron from other foods; its amino acid composition complements that of many foods and is a concentrated source of B vitamins and other nutrients (McAfee *et al.*, 2010; Wardlaw *et al.*, 2004). Meat consumption depends on socio-economic factors, ethnics or religious beliefs and tradition. Most of individual socio demographic factors play a key in determining both the probability participation and the quantity consumed level of the meat and meat products (Karli and Bilgic, 2007). The food consumption patterns are rapidly changing in Turkey, as well as in other developing countries. Per capita consumption of meat and meat products has decreased and a greater consumption of quality is an important factor in a highly competitive market (Bozkurt *et al.*, 2011). Consumers evaluate quality with a subjectively perspective. Quality of food was related to the consumer demands, expectations and desires (Grunert, 1995). The knowledge of quality evaluation of the consumer is to interact between perceptions, physical product and process attributes (Steenkamp, 1990; Grunert, 2006).

Meat and meat products vary according to intrinsic and extrinsic parameters that can sometimes be shaped to make a product more desirable (Furnols and Guerrero, 2014). Two types of quality cues, intrinsic and extrinsic have been proposed (Becker *et al.*, 2000; Grunert, 1997; Steenkamp and Van Trijp, 1996). The concept of search experience and credence characteristics defined in terms of intrinsic and extrinsic characteristics (Olson and Jacoby, 1972). Intrinsic cues are those that are associated with the physical characteristics of the product such as taste and flavor, while extrinsic characteristics are all other characteristics such as brand name and the reputation of the seller (Bredahl, 2004; Jacoby *et al.*, 1971; Ness *et al.*, 2010). Whilst the former are part of the physical product, for example, the color or tenderness of the meat, the latter are related to the product but are not a physical part of it, such as price or labeling (Steenkamp and Van Trijp, 1996; Grunert *et al.*, 2004; Ophuis and Van Trijp, 1995). The aim of this study is to determine the consumer's consumption frequency, knowledge levels and opinion of quality cues of meat and meat products.

MATERIALS AND METHODS

The study was conducted as a cross-sectional, general survey model in Aksehir county of Konya province, Turkey. The sample group of the research consists of 402 (216 male and 186 female) consumers who were selected using random sampling method. The survey data were collected through face-to-face interview method by the first author using survey instrument which they prepared reviewing the earlier studies (Grunert, 2006; Becker *et al.*, 2000; Grunert, 1997; Grunert *et al.*, 2004; Jae-Eun *et al.*, 2006; Verbeke and Viane, 1999). In the survey instrument, open-ended questions were placed to determine demographic characteristics of the consumers, meat and meat products consumption frequencies, level of knowledge and quality cues taken into consideration when purchasing meat and meat products.

Participants were asked to indicate how often, they had consumed eight meat and meat products. Meat and meat products consumption frequency was assessed with a 6-item scale (everyday, 2-3 times a week, once a week, once in two weeks, once a month, not consume). In the survey instrument, the statements were included with the objective of determining the quality cues of the participants regarding meat and meat products. Some studies (Olson and Jacoby, 1972; Bredahl, 2004; Grunert *et al.*, 2004) were utilized in the development of the statements.

The statements were assessed by a 5-point Likert scale. For each of the items by choosing between five responses: "very important," "important," "neither important nor unimportant," "unimportant," and "very unimportant" scored 5 to 1. In order to evaluate the suitability analysis of the data set, Kaiser-Meyer-Olkin (KMO) test was performed and KMO value was found to be 0.852. The results were significant according to Bartlett Sphericity Test ($p = 0.000$) shown in Table 3.

In order to measure the significance of Meat and Meat Products Quality Cues (MaMPQC) given by the consumers, explanatory factor analysis was performed to assess the structural validity of the scale. According to the results of the factor analysis, MaMPQC scale was seen to be composed of two factors. The factors were named taking into consideration, the contents of the items in the factors. First factor was named intrinsic quality cues; the second factor was named extrinsic quality cues and so on. Loading of Factor 1 was between 0.51 and 0.76, Factor 2 ranged between 0.69 and 0.89 (Table 3). The reliability analysis of item scales was tested using Cronbach's alpha and the score was recorded 0.89.

The knowledge test in the survey instrument comprised of 25 multiple choice questions evaluated on 100 points in total. The questions on knowledge test included headings such as "Food Safety", "Nutrition and Health" and "Production and Consumption". The statistical

analyses were conducted using SPSS software. The analysis includes Kaiser-Meyer-Olkin (KMO) test, Bartlett sphericity test, factor analysis, Cronbach alpha, cross-tabulation with Chi-square significance test and independent samples t-tests for comparison of means.

RESULTS

Demographic characteristics of the participants' have been given in Table 1. Approximately 53.7% of the participants were males, 46.3% were females; 74.9% were married, 30.3% possessed an education at Bachelor's degree. Regarding professions, 36.8% were employee and 34.3% as civil servant (Table 1). The age, monthly salary, monthly food expenditure means ($\bar{x} \pm S$) were determined to be 36.59 ± 0.52 years, 1916 ± 54.66 Turkish Lira (TL) and 509 ± 18.68 TL, respectively.

Table 1: Socio-demographic factors of participants

Variables	n	%
Gender		
Male	216	53.7
Female	186	46.3
Total	402	100.0
Marital status		
Single	91	22.6
Married	301	74.9
Divorced	10	2.5
Total	402	100.0
Educational level		
Primary school	83	20.6
Secondary school	36	9.0
High school	102	25.4
Associate degree	59	14.7
Bachelor's degree	122	30.3
Total	402	100.0
Profession		
Employee	148	36.8
Civil servant	138	34.3
Self employment	94	23.4
Retired	22	5.5
Total	402	100.0
Family members		
2-3 person	156	38.8
3-4 person	187	46.5
5 person or more	59	14.7
Total	402	100.0

Frequency of meat and meat product consumption of consumers, by gender has been given in Table 2. When considering meat consumption frequencies of participants, beef held the first rank (95.5%) and mutton/lamb (54.5%) and goat (24.9%) were followed it respectively. Frequency of consumption of beef, mutton/lamb, goat meats once per week by participants were 23.2, 5.2 and 1.0%, respectively. Frequency of consumption of beef, mutton/lamb and goat meat based on gender differences were found to be statistically insignificant ($p > 0.05$). Among meat products, frequency of consumption of sucuk, pastrami, salami, sausage and braised meat, 2-3 times per week, were in the ratio

Table 2: Meat and meat product consumption frequencies of consumers by gender

Meat and meat products	Gender		1	2	3	4	5	6	χ^2	p
Beef	Male	n	5	26	51	45	70	5	9.962	0.076
		%	2.3	12	23.6	20.8	37.6	2.3		
	Female	n	4	32	42	25	84	13		
		%	2.2	17.2	22.6	13.4	38.9	7.0		
	Total	n	9	58	93	70	154	18		
		%	2.2	14.4	23.2	17.4	38.3	4.5		
Mutton/Lamb	Male	n	2	3	13	33	67	98	3.225	0.665
		%	0.9	1.4	6.0	15.3	36.0	45.4		
	Female	n	2	4	8	20	67	85		
		%	1.1	2.2	4.3	10.8	31.0	45.7		
	Total	n	4	7	21	53	134	183		
		%	1.0	1.7	5.2	13.2	33.3	45.5		
Goat	Male	n	0	2	3	17	29	158	1.990	0.738
		%	0	0.9	1.4	7.9	15.6	73.1		
	Female	n	0	2	1	10	36	144		
		%	0	1.1	0.5	5.4	16.7	77.4		
	Total	n	0	4	4	27	65	302		
		%	0	1.0	1.0	6.7	16.2	75.1		
Sucuk (Dry Fermented Sausage)	Male	n	16	43	52	26	34	45	24.840	0.000
		%	7.4	19.9	24.1	12.0	15.7	20.8		
	Female	n	6	36	30	39	54	21		
		%	3.2	19.4	16.1	21.0	29.0	11.3		
	Total	n	22	79	82	65	88	66		
		%	5.5	19.7	20.4	16.2	21.9	16.4		
Pastrami	Male	n	1	2	3	24	36	150	10.118	0.072
		%	0.5	1.0	1.5	11.1	16.7	69.4		
	Female	n	2	3	5	8	44	124		
		%	1.1	1.6	2.7	4.3	23.7	66.7		
	Total	n	3	5	8	32	80	274		
		%	0.7	1.2	2.0	8.0	19.9	68.2		
Salami	Male	n	11	20	25	7	18	135	8.46	0.133
		%	5.1	9.3	11.6	3.2	8.3	62.5		
	Female	n	6	18	23	15	24	100		
		%	3.2	9.7	12.4	8.1	12.9	53.8		
	Total	n	17	38	48	22	42	235		
		%	4.2	9.5	11.9	5.5	10.4	58.5		
Sausage	Male	n	6	24	17	12	13	144	12.716	0.026
		%	2.8	11.1	7.9	5.6	6.0	66.7		
	Female	n	5	15	22	16	26	102		
		%	2.7	8.1	11.8	8.6	14.0	54.8		
	Total	n	11	39	39	28	39	246		
		%	2.7	9.7	9.7	7.0	9.7	61.2		
Braised Meat	Male	n	0	12	5	26	65	108	12.322	0.031
		%	0	5.6	2.3	12.0	30.1	50.0		
	Female	n	2	3	10	13	54	104		
		%	1.1	1.6	5.4	7.0	29.0	55.9		
	Total	n	2	15	15	39	119	212		
		%	0.5	3.7	3.7	9.7	29.6	52.7		

1: Every Day, 2:2-3 Times a Week, 3: Once a Week, 4: Once a Time in 2 Weeks, 5: Once a Month, 6: Not Consume

19.7, 1.2, 9.5, 9.7 and 3.7%, respectively and consumption as per gender in case of sucuk, sausage and braised meat were found to be significantly different ($p < 0.000$, $p < 0.05$, $p < 0.05$).

Results obtained after performing factor analysis on the data show that the internal consistency of the items with each other were statistically significant (KMO and Bartlett Test: 0.852, $p = 0.000$). Obtained findings demonstrate that quality cues of participants regarding meat and meat products collect on two particular factors. Intrinsic

and extrinsic items' Cronbach alpha reliability coefficients were determined 0.83 and 0.89, respectively (Table 3).

As a result of the findings, the mean ($\bar{x} \pm S$) of flavor, freshness, cut of meat, tenderness, healthy, nutritious and color of intrinsic quality items of meat and meat products scores were determined 4.45 ± 0.045 , 4.40 ± 0.045 , 4.24 ± 0.048 , 4.21 ± 0.047 , 4.17 ± 0.047 , 4.12 ± 0.051 and 3.90 ± 0.056 , respectively. No significant difference was found between intrinsic quality items by

Table 3: Consumers' meat and meat product quality cue factor loads

Items ^a	Factor 1	Factor 2
Intrinsic ^b	Colour	0.514
	Freshness	0.694
	Healthy	0.766
	Nutritious	0.716
	Tenderness	0.609
	Cut of meat	0.688
	Flavor	0.752
Extrinsic ^c	Package	0.757
	Label	0.812
	Brand	0.896
	Safety	0.695
	Price	0.855

^aCronbach's α : 0.89 ^bCronbach's α : 0.83 ^cCronbach's α : 0.89

gender ($p > 0.05$). However, significant difference belonging to the extrinsic quality items of mean scores ($\bar{x} \pm S_x$) of price, package, label, legal permission and brand were detected 3.81 ± 0.060 , 3.72 ± 0.061 , 3.60 ± 0.058 , 3.58 ± 0.065 and 3.57 ± 0.063 , respectively. The entire extrinsic quality item scores were confirmed significantly different by gender ($p < 0.000$) (Table 4). The total intrinsic cue scores of the participants were higher than their extinction cue scores. In addition to the findings, flavor (4.45 ± 0.045) and price (3.81 ± 0.060) were the highest mean scores in quality cues of meat and meat products among the participants.

Mean knowledge scores ($\bar{x} \pm S_x$) of participants regarding meat and meat products were found to be 62.15 ± 0.69 . Total score means ($\bar{x} \pm S_x$) based on gender were determined for males to be; 64.45 ± 0.90 and females; 59.47 ± 1.05 . Difference between the two groups were found to be statistically significant ($F_{(400)}: 7.455$; $p = 0.000$) (Table 5). Participants' mean knowledge score about red meat and red meat products was ($\bar{x} \pm S_x$) 62.15 ± 0.6 and there was significant difference between genders in terms of mean knowledge scores ($t: 3.597$, $p > 0.05$).

Besides, news about food safety of meat and meat products posted on printed or visual media did not create an effect on consumption according to gender ($\chi^2: 1.423$; $p = 0.233$). Also, awareness regarding presence of food safety legal documents in meat and meat products selling points were not found to be significantly different among genders ($\chi^2: 1.057$; $p = 0.304$). Information about meat and meat products broadcasted on the media did not affect meat consumption ($\chi^2: 1.423$, $p > 0.05$).

DISCUSSION

The participants' meat and meat products consumption frequency, knowledge levels and the criteria were examined and assessed with different variables that affect purchasing in this study.

According to gender, consumption patterns show differences. This variable was used in the model

considering that women consume less meat than men. Gender had a strong influence on meat consumption in US residents (Gossard and York, 2003). The researchers (Gossard and York, 2003) implied that men physiologically consumed more meat than women due to the average differences in weight. Consumer education level was found to be an important factor for healthy diet behavior. This model was emphasized on the fact that better educated families show better nutritional awareness. Another study (Liu and Deblitz, 2007) emphasized that education and income levels influenced purchasing criteria of beef consumption in China.

According to the results, goat meat was found to be consumed at the lowest level (24.9%) among meats. Similar results were obtained in some other studies (Akçay and Vatansever, 2013; Lorcu and Bolat, 2012) at different regions (Kocaeli and Edirne) in Turkey. Other studies (Ulas, 2011; Karakus *et al.*, 2008) suggested that meat consuming rate was found very high in east regions of Turkey. However meat consumption frequency was very low in west regions of Turkey (Atay *et al.*, 2004; Yaylak *et al.*, 2010). Thus, the differences of meat consumption rates were caused by regional and cultural (cuisine e.g.) and socio-demographic and economic discrepancies.

It was found that participants consumed beef, mutton, goat meat, fermented sausage, pastrami, salami, sausage and braised meat two to three times in a week-a consumption frequency that was found to be very low. According to final report on the Nutritional Status and Habits of Turkey (TNHR, 2010), the total ratio of those who not consumed meat was found 20.2% around the Turkey, while the women were detected to be 23.2 and 17.6% among men.

Quality cue results of this study were similar to other researchers (Steenkamp and Van Trijp, 1996; Olson and Jacoby, 1972; Jacoby *et al.*, 1971; Acebron and Dopico, 2000; Grunert *et al.*, 1996). However some cues (race, sex, origin etc.) were not significantly performed by statistical factor loads because of this finding could be caused by consumers who were living in rural locations in Turkey.

Quality cues are what the consumer observes and quality attributes are what the consumer wants. Quality cues are important only to the extent that they act as consumer perceived indicators for attributes (Steenkamp, 1989). In this study, price was considered to be the most important extrinsic cue for consumers. The price can assist consumers inferring product quality and forming quality expectations, which in turn influence a whole range of attitudes and behaviors related to food purchasing, meal preparation, satisfaction and future purchase decisions (Brunso *et al.*, 2002; Grunert, 2005). In a previous study conducted in Turkey, it was found that quality and price were the most critical criteria in

Table 4: Consumers' of meat and meat product consumption quality cue scores

Cues	Items	Gender	$\bar{x} \pm SD$	t-value	p
Intrinsic	Color	Female	3.99±0.081	2.981	0.133
		Male	3.82±0.078		
		Total	3.90±0.056		
	Freshness	Female	4.45±0.065	1.008	0.276
		Male	4.35±0.064		
		Total	4.40±0.045		
	Healthy	Female	4.24±0.069	0.000	0.204
		Male	4.12±0.065		
		Total	4.17±0.047		
	Nutritious	Female	4.22±0.071	0.286	0.074
		Male	4.03±0.071		
		Total	4.12±0.051		
	Tenderness	Female	4.29±0.067	1.552	0.136
		Male	4.14±0.066		
		Total	4.21±0.047		
	Cut of Meat	Female	4.29±0.072	0.328	0.319
		Male	4.19±0.064		
		Total	4.24±0.048		
Flavor	Female	4.52±0.063	1.689	0.157	
	Male	4.39±0.063			
	Total	4.45±0.045			
Extrinsic	Package	Female	4.01±0.080	20.546	0.000
		Male	3.47±0.088		
		Total	3.72±0.061		
	Price	Female	4.10±0.077	17.985	0.000
		Male	3.56±0.086		
		Total	3.81±0.060		
	Brand	Female	3.97±0.081	18.576	0.000
		Male	3.23±0.089		
		Total	3.57±0.063		
	Legal permission	Female	3.87±0.088	7.369	0.000
		Male	3.34±0.092		
		Total	3.58±0.065		
	Label	Female	3.97±0.075	11.029	0.000
		Male	3.29±0.080		
		Total	3.60±0.058		

Table 5: Consumption knowledge scores meat and meat products

Gender	n	\bar{x}	df	Std. error	t-value	p
Male	216	64.45	400	0.902	7.455	0.000
Female	186	59.47		1.059		
Total	402	62.15		0.690		

purchasing meat, followed in order of importance by cholesterol content (14.5%) and the presence of a grade stamp or quality standard certificate (12.8%) (Karabudak *et al.*, 2008). Therefore, price plays an important role in value evaluation (Issanchou, 1996). Some researchers (Acebron and Dopico, 2000; Zeithaml, 1988) emphasized that price monitored as a favorable cue when consumers do not have sufficient information about intrinsic cues. Therefore it has an affirmative strong influence and direct proportion between price and expected quality.

Conclusions: The study provides the consumption frequency, knowledge levels and opinion of quality cues

of meat and meat products of consumers in Aksehir, Konya. It has shown that beef and sucuk (dry fermented sausage) was the most frequently consuming product between the meat and meat products. This can be explained by the fact that the beef and fermented sausage are produced and consumed more than other meats and products in Turkey. In addition, the specific flavor of and being a traditional food of the fermented sausage are among the factors that increase its frequency of consumption. As already stated, the higher intrinsic cue scores might have been caused by the fact that the consumers paid more attention to the items such as freshness, healthy, being nutritious etc. Extrinsic attributes can be perceived by the consumer

through appropriate cues that help them evaluate credence and experienced quality. The reason why the price is the highest score among extrinsic cues is due to the perception of its positive relation to the quality. Therefore many studies may be conducted on determining the consumers' preference, perception and behaviors on meat and meat products as well as quality cues in Turkey. The cooperation of all stakeholders on increasing the level of knowledge, purchasing behaviors and quality expectations concerning meat and meat products is considered to be useful.

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