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The Factor Which Affect Juice Consumption of Families Who are Living in Edirne Province

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ÖZET: In this study, the juice consumption and the factors which affect the juice consumption of the families in the centre district of Edirne was investigated. The data used in the study have been obtained from the surveys conducted through face-to-face interviews with 384 families. In the study, it has been identified that a total of 82.8 % of the consumers consumed fruit juice. In the juice consumption the consumers prefer mostly cherry juice and cappy as a brand. In this research, Logit analysis was used to analyze the factors which affect the juice consumption of the families. According to analysis results; it is obvious that the level of income the families, their educational background, the number of the family members, the seasonal variables influence the juice consumption.

Anahtar Kelimeler: Juice, consumption, consumers' behaviors, logit model, Edirne

Edirne İlinde Yaşayan Ailelerin Meyve Suyu Tüketimini Etkileyen Faktörler

ABSTRACT: Bu çalışmada, Edirne ili merkez ilçedeki ailelerin meyve suyu tüketimi ve meyve suyu tüketimini etkileyen faktörler incelenmiştir. 384 aile ile yüz yüze görüşme ile anket çalışmasından elde edilen veriler kullanılmıştır. Çalışmada, ailelerin % 82.8'inin meyve suyu tükettiği belirlenmiştir. Meyve suyu tüketiminde tüketiciler çoğunlukla vişne suyunu tercih etmektedirler ve marka olarak Cappy markasını tercih etmektedir. Bu araştırmada, ailelerin meyve suyu tüketimini etkileyen faktörleri belirlemek için Logit Analizi kullanılmıştır. Analiz sonuçlarına göre, ailelerin gelir düzeyi, eğitim düzeyi, ailedeki kişi sayısı ve mevsimsel değişkenler meyve suyu tüketiminde etkili olarak belirlenmiştir.

Keywords: Meyve suyu, tüketim, tüketici davranışları, logit model, Edirne

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INTRODUCTION

Taking into the consideration of the social and economic development of a country, human potential is an important factor. Every living creature has to be nourished to survive (Yılmaz ve Özkan, 2007). It is necessary to take nutritional elements required for human's rising up in a healthy and fruitful way of life. When one of these elements are not taken or taken insufficiently or taken too much, it has been revealed scientifically that the growth can be prevented and this can cause health problems (Baysal, 2004).

In addition, Juice is important for balanced and adequate nutrition. The studies in recent years have shown that the vegetable and fruit consumption provides to maintain to be healthy and protect us from chronic diseases (Steinmetz and Potter, 1996, Ness and Powless, 1997; Reddy and Katan, 2004;) and to live a healthy life, and to achieve this aim it is necessary to take abundant vitamins. Fruits and fruit juices are considered as one of the main natural source of antioxidants, recommended to take part in a healthy diet. It is known that fruits as well as fruit juices have an antioxidant activity and this effect is based on particularly phenolic compounds, Vitamin C, and carotenoids (Netzel and et al., 2002; Lugasi and Havari, 2003). Furthermore, it is also indicated that taking into consideration of the digestion of the health protective bioactive compounds, the fruit juices are more suitable for food products in comparison to fruits (Burdurlu ve ark., 2005).

Although per capita of the juice consumption in Turkey has been increasing each year, compared to America and EU average where it has been ranging in quite low levels. In 2010, the average per capita of the amount of the juice consumption and similar products has reached about 12 liters.

Approximately 9 liters of this amount is consisted of 100% fruit juice and nectar. In Europe the annual average per capita of the fruit juice consumption and nectar is about 23 liters, and it is almost 3 times more than in our country (Anonim, 2014).

In this study, the fruit juice consumption of the families in central district of Edirne the preference reasons of the fruit juice consumption and the factors which affect the brand preference were examined. This study leads to reveal the fruit juice consumption habits and its preferences by determining the target consumption in accordance with these habits the organizations that operate in food sector.

Some studies have been conducted regarding juice and its consumption (Artık ve Halkman 1994; Dennison, 1996; Liftshitz,1996; Barbara, and et al. 1999; Özdeş Akbay ve ark., 1999; Lindström et al. 2001; Burdurlu ve ark., 2005; Marietjie et al. 2013).

MATERIAL AND METHODS

The main material of the study consist of the data obtained from the survey in 2013 performed with the families living in central district of Edirne. To determine the number of the families to whom the survey would be conducted, firstly the population of the central district was identified from the official records. The sample volume was determined with the help of the following equation.

This population was determined using the formul sample number (Baş, 2008):

$$n = \frac{N \cdot t^2 \cdot p \cdot q}{d^2 \cdot (N - 1) + t^2 \cdot p \cdot q}$$

Where in

n; is the number of individuals to be sampled

N; is the individual in the target group (162 161),

p; is the event's probability of occurrence (0.50),

q; is the event's probability of nonoccurrence (0.50),

t; Standard normal distribution value (1.96),

d; Sampling error (0.05).

It was performed with 5% margin of error within 95 % confidence limits. As a result of the performed calculation, the sample volume was determined as 384.

In the study Logit model was used in order to identify the factors which affect the fruit juice consumption in central district of Edirne.

In the Logit regression analysis method, social and economical aspects have also been approached on the consumer profile such as consumer attitude and

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behavior (Inal et al., 2006; Akyıldız and Marangoz, 2008; Özer and Lebe, 2008).

Logit model is formed of a statistical method that analysis tabulated or raw data sets which provides opportunity to make classification appropriate for rules of likelihood by calculating the estimated values of a dependent variable as likelihood (Özdamar, 1999).

Maximum Likelihood (ML), Reweighted Iterative Least Square (RILS) and in case of iterative data Minimum Logit Chi Square (MLCS) methods are used in parameter estimation of logistic regression model (Murat ve Işığıçok, 2007). Frequently used method among these methods is likelihood method.

Logit regression model is a nonlinear regression model that has been designed for at least two dependent variables. In other words, it is a nonlinear model that can be linearize with appropriate conversions (Stok and Watson, 2007).

Also in this research, the factors which affect the fruit juice consumption were investigated by binary logit regression.

General functional indication of logit matters are as followed (Gujarati, 1992);

juice consumption of the families "I" observed for family index function;

juice unconsumption of the families I=0 and juice consumption of the families I=1 are used in this study.

B= Coefficient vector of explanatory variables

X_i = Explanatory variables representing the family characteristics

ε_i = Indicates error term.

juice consumption of the families;

P_i = Likelihood of dependent variable

e = 10 based natural logarithm and approximately 2.7182.

$Z_i = B_0 + B_i X_i$

juice consumption of the families's odds ration Pi

$$Pi = \frac{Pi}{1 - Pi} + \frac{1 + e_i^x}{1 + e_i^x}$$

If natural logarithm of the formula that is the odds ratio of Juice consumption o the families

we reach the result below.

$$\frac{\ln P_i}{1 - P_i} = Z_i$$

$Z_i = B_0 + B_i X_i$

B: Represents the parameters to be estimated for each explanatory variable,

X_i: Represents i. independent variable.

In this study the factors were used as explanatory variables in order to constitute the binary logit analysis of the fruit juice consumption of the consumers.

$Y = B_o + B_{1\,cinsiyet} + B_{2\,yaş} + B_{3EGTM} + B_{4EŞÇLŞ} + B_{5ABS} + B_{6G} + B_{7MVSM}$'dir.

RESEARCH AND FINDINGS

Of the people who participated to the survey 41.4 % were male and 58.6% were female. According to the survey, the household size is consisted of 3.59 people. Of the consumers 45.1 % were single, 47.9 % were married, 7% were divorced.

In terms of educational status of the family members, of those 0.3 % were illiterate, 6.5 % were literate, and were identified as graduates of 15.4 % from primary school, 8.6% from secondary school, 21.1% from high school, 45.8 % from university, 1.6 % from master degree, and 0.7 % from doctorate. Considering the monthly average income of the examined families, it is obvious that a total of 7.8 % is between 0-1000 TL., of 18% 1001-1500 TL, of 24 % 1501-2000 TL, of 24.5 % 2001-2500 TL, 19.7 % 2501-3500 TL, of 6% 3501 and above.

Annual average food expenditure of the families is

478 TL. Whereas a total of 64.5 % the consumers' wives or husbands work, 35.5 % of those wives or husbands don't work. Taking the professions of the participants into consideration a total of 20.6 % were officers, of 20.8 % were workers, 12.5 % were self-employed, of 17.2 % were housewives, of 28.9 % were unemployed. While a total of 82.8 % of the participants consume fruit juice, 17.2 % of those do not consume. A total of 30 % of the consumers indicated that they consume the fruit juice in the morning, of 33 % in the afternoon, of 37 % in the evening, It is identified that the fruit juice has been consumed mostly in summer (71.1 %). A total of 92.1 % of the consumers consume a known branded juice, and of 7.9 % don't consume a known branded juice. In the juice consumption by product type has been found that mostly cherries (75 %), respectively, apricot (69 %), orange (68 %), peach (65 %), mixed (63 %), pomegranate (50 %), apple (39 %), red fruits (38 %), yellow fruits (35 %), pineapple (23 %) are consumed.

The most consumed juice brands are respectively, cappy (45 %), tamek (19.8 %), dimes (18.2 %), meysu (4.1 %), Juss (3.5 %), Jucy (2.2 %), and other brands (7.2 %).When those who did not consume juice were asked the reasons of not consuming juice, they indicated that a total of 42 % did not like, of 24 % found it expensive, 19 % harmful to health, 15 % not natural. In terms of brand preference a total of 55.3 % of the consumers have always bought the same brand and of 44.7 % have changed the brand.

Out of the people, who participated to the survey, 67.6 % stated that they decided to buy the juice at the time of the purchasing and the other 32,4 % prior to the purchasing.

Table 1. Reasons to prefer the same brand juice

	Absolutely disagree	Disagree	Partially agree	Agree	Absolutely agree	Score	Order
Avaliability	5.1	5.1	15.3	31.1	43.5	4	4
Good quality	2.3	1.1	3.4	23.7	69.5	4.6	2
Cheaper price	13.6	31.6	20.3	15.8	18.6	2.9	6
Reliable brand	0	0	4.5	23.7	71.8	4.7	1
Habit	0.6	10.2	16.4	29.9	42.9	4.1	3
Good packaging	10.2	23.7	22.6	28.2	15.3	3.2	5

When examining the reasons of the preference same brand juice of the consumers in Table 1, it is seen that firstly they took consideration that it was the reliable brand product. Respectively, this was followed by good quality, availability, good packaging, cheaper price.

Table 2. Reasons for changing the juice brand

	Absolutely disagree	Disagree	Partially agree	Agree	Absolutely agree	Score	Order
Higher price	4.9	17.5	16.1	20.3	41.3	3.8	4
The effect of advertisement	9.8	23.1	27.3	24.5	15.4	3.1	6
Discounts	2.1	7.7	21	32.2	37.1	4	2
Promotion	1.4	12.6	15.4	37.1	33.6	3.9	3
Quality problem	2.1	2.8	26.6	25.9	42.7	4.1	1
Packaging problem	6.3	32.9	23.8	20.3	16.8	3	7
Unavailability	9.1	18.9	32.9	23.8	15.4	3.2	5

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In Table 2, the consumers stated that they change the brand initially when they encounter a problem in the purchased juice. In the research it is identified that the consumers change the juice brand respectively with the effect of discounts, advertisements, and promotion, higher price, unavailability and packaging problem.

Tablo 3. The results of Logit model

	B	S.E.	Wald	df	Sig.	Exp(B)
Age (YŞ)	-.147	.076	3.712	1	.054**	.863
Gender (CNS)	.276	1.502	.034	1	.854	1.318
Education (EGTM)	1.765	.708	6.214	1	.013*	5.839
Working Status of Spouse (EŞÇLŞ)	.923	1.655	.311	1	.577	2.516
Number of family members (ABS)	2.463	.992	6.161	1	.013*	11.743
Average monthly income of the family TL/month (G)	2.516	.981	6.581	1	.010*	12.375
Season (MVSM)	5.771	2.404	5.765	1	.016*	320.936
Constant	-19.055	7.955	5.737	1	.017	.000
* Statistically significant at the 5 % level ** Statistically significant at the 10 % level						

In the logit regression, the comparison of the observed value with the estimated value is based on logarithmic likelihood (log likelihood-LL) function (Akgül ve Çevik, 2005).

H0: $\beta_0 = \beta_1 = \beta_2 = \ldots\ldots = \beta_k = 0$

H1 : $\beta_0 \neq \beta_1 \neq \beta_2 \neq \ldots\ldots \neq \beta_k \neq 0$ (at least one of them is different from zero) hypothesis is established.

At the model, only in the logit regression which contains only the constant value, -2 LL value is 193. 654 (step 0). The -2 LL value of goodness of fit statistics of the model, containing all the independent variables, is 22. 358 (step 1) and it is lower than 193.654, the model containing only the constant value.

The "Chi-square" (x^2) of the model, provides the difference between -2 LL containing only the constant value and -2 LL value containing all the variables. The model tests the null hypothesis whose coefficients of the independent variables would be zero in the current model except constant "Chi-square" statistics.

This is equivalent to the F test in regression model (Akgül and Çevik, 2005). In the model "Chi-square" value is 171.296, P=0,00. In the test in question as P=0.000, H_O hypothesis has been rejected. Here, it shows that at least one coefficient is different from zero. The estimated model has been found significant.

The two of the R^2 statistics obtained with SPSS are Cox and Snell R^2 and Nagelkerke R^2 statistics (Kalaycı, 2006). According to the likelihood basis, Cox and Snell R^2 is similar to multiple R^2 statistics. Since the maximum value of the statistics is lower than 1, it makes these statistics difficult to interpret. In the conducted study, Cox and Snell R^2 value of the model was found as 0.602. This rate shows the link of approximately 60.2 % between the dependent variable and the independent variables. Nagelkerke R^2 statistics has been developed in order to ensure that Cox and Snell R^2 statistics get a value between 0-1. In the study Nagelkerke R^2 value has been found as 0.930. This means that there's a correlation of 93 % between the dependent variable and the independent variables. These values show that the logistic model is appropriate.

According to the Logit model results shown in Table 1; EGTM, ABS, G, MVSM variables were found statistically significant at the 5% significance level. And YŞ is found significant at the 10 % level. CNS, EŞÇLŞ are not found statistically significant.

In terms of logit regression results shown in Table 1, Odss rates were taken into consideration in the interpretation of the estimated values. Accordingly, Odss rates of the variables, considered statistically significant, were interpreted.

In the research the age variable has been found statistically significant at the level of 10 %. The coefficient of YŞ variable has been negative and the value of the coefficient is -0.147. The Odss rate of YŞ variable has been 0.863 and since it has been close to zero, it is necessary to make correction. The correction is made at the rate of 1/Odss (Tüzüntürk, 2007). 1/0.863=1.158. When the age increases to one unit, the juice consumption is reduced to 1.158.

EGTM variable is statistically significant at 5% level. The coefficient of the education variable is 1.765 and it is positive. A unit of increase at education level increases the likelihood of juice consumption of the consumers 5.839 times more (see Table 5,62).

The coefficient of ABS variable, which is statistically significant and added to the model, is 2.463 and it is positive. As ABS increases, the likelihood of the juice consumption increases as well. The Odss rate of ABS coefficient has been found as 11.743. According to this, the increase of one unit in the number of the family members has increased the juice consumption 11.743 times more.

The coefficient of G variable is 2.516 and has a positive value. It has been found statistically significant at the 5% level. As the monthly income of the family increases, the likelihood of the juice consumption increases as well. The Odss rate of income of the family members has increased the juice consumption 12.375 times more.

CONCLUSIONS

The aim of the conducted research is to determine the factors which affect the consumer decisions and their juice preferences. A total of 82.8 % of the consumers consume juice.

It has been identified that the most preferred juice brand by the families is cappy and the type of the juice is cherry. It has been determined that the consumers consume the juice mostly in the evening and in summer. Supplying the juice consumption to take part in the breakfast habits in the morning is important in terms of healthy nutrition; therefore, it is important to raise awareness of consumers.

In the study the factors affecting the juice consumption have been analyzed using Logit model. According to model results; the variables affecting statistically the likelihood juice consumption, are identified as education, the number of the family members, income and season. When the education level in the family increases one level, because of the increase in the awareness, it is estimated that the juice consumption increases as well. As the level of income increases, the increase of juice consumption is also an expected result. The preference reason of the people participating in the research is the reliable brand of the product. It is identified that the main reason of changing the brand is the quality problem of the juice.

It is determined that the juice consumption has increased in summer months. It is estimated that juice is consumed more because of the cooling effect of cold juices in hot summer months.

It is important to have a healthy society for the development of the countries. In order to have a healthy society, balanced and adequate nutrition is important. The juice consumption plays an important role in our daily nutrition in terms of content of the vitamins. The consumers cannot find every fruit in all seasons. Thus, they should consume juice to take vitamins. Although the per capita of the juice consumption in Turkey has been increased in recent years, it is in low level in comparison to EU averages. It is found that the juice consumption in developed countries has been much more. It is necessary to raise the awareness of the consumers in order to increase the juice consumption, the juice consumption should be considered as an indispensable phenomenon in the formation of healthy generations. Introducing the benefits of the juice, its consumption should be supported. Providing the consumers with the required information by educational and public institutions, non-governmental organizations the juice consumption should be increased. In the juice consumption R&D and innovative studies should be supported in order to increase the juice production.

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