PAPER

TURKISH CONSUMER DECISIONS AFFECTING ICE CREAM CONSUMPTION

YAVUZ TOPCU
Department of Agricultural Economics, Collage of Agriculture, Ataturk University
25240-Erzurum, Turkey
Tel. 90 4422311393,
email: yavuztopcu@atauni.edu.tr

ABSTRACT

The aim of the study is to determine the main factors affecting the national-branded ice cream preferences of Turkish consumers, and to analyze the relationships between their preferences and consumption amounts. The data obtained from 400 households in Kahramanmaras, Turkey were used for *Principal Component, K-Means Cluster* and *Multiple Regression Analyses.* The results of the study highlighted clearly that the consumers of *the high (C1), middle (C2)* and *low-income users (C3)* satisfied with the manufacturer brand, the individual private label, and the retailer brands on the ice cream purchase decision and consumption amounts, respectively. The manufacturers, retailers and marketers of the ice cream, therefore, should implement effectively the manufacturer brand, the private label and the retailer brand for *C1, C2* and *C3*, respectively, and then they could also increase the demand trends of the target consumers segments satisfied.

- Keywords: Ice cream attributes, manufacturer/national brand, principal component, cluster and multiple regression analyses, Turkish consumers' purchase decisions -

INTRODUCTION

Consumers purchase decisions towards the food products are a complex phenomenon influenced by a numerous factors classified as product-related (intrinsic and extrinsic food attributes), consumer-related (demographic, personal, psychological and physiological characteristics) and marketing environmental-related (economic, cultural, natural, technological, political and social environments) (REALINI *et al.*, 2013; TOPCU and UZUNDUMLU, 2012; TROY and KERRY, 2010; TOPCU *et al.*, 2009). Traditional sensory analyses focused on the intrinsic product attributes are not sufficient to meet not only the requirements of today's fast developing food markets but also the food choices of the consumers at the sale points. In order to be able to reply the consumers' need and willingness to buy, therefore, the suppliers must evaluate the food products with integrated approaches covering their intrinsic and extrinsic attributes by thinking of the consumers' socioeconomics characteristics.

In order to design the actual food product image optimized, the suppliers have focused on not only the intrinsic ice cream[1] attributes such as the sensory, structural, visual, nutritional, chemical and confidential properties including in aroma, taste, flavor, viscosity, color, texture and its content (REALINI *et al.*, 2013; MENICHELLI *et al.*, 2012; TOPCU and UZUNDUMLU, 2012; SOUKOULIS *et al.*, 2010; SIMEONE and MAROTTA, 2010; TOPCU *et al.*, 2009) but also the extrinsic ones consisting of hedonic quality attributes such as the price, country of origin, actual product image and quality, brand, labelling, packaging, promotion, advertising, etc. (TOPCU and UZUNDUMLU, 2012; TROY and KERRY, 2010; TOPCU *et al.*, 2009; SIRO *et al.*, 2008; McCARTY *et al.*, 2003; ORTH and FIRBASOVA, 2003) along with the consumers' socioeconomic characteristics such as income, food expenditure, education, age and lifecycle, occupation, etc. (TOPCU, 2012; TOPCU and UZUNDUMLU, 2012; TOPCU *et al.*, 2009).

While the consumers have considered the hedonic and visual quality attributes of the ice creams at point of sale before purchase and the sensory ones after consumption; the manufacturer, retailer and marketers have also interested with their various attributes to develop, improve and design the innovative ice creams based on their need and willingness to buy.

Providing an important communication among the manufacturer, retailer and the consumers, and then establishing a strong bridge between each group; the brands, one of the utmost important pieces of the information read a foodstuff, play an important role on the consumers' purchase decision making processes (TOPCU *et al.*, 2008; WULF *et al.*, 2005; GUERRERO *et al.*, 2000). Their effects on the purchase decisions, therefore, could be explained by several functions including in their identification and attributes, the reference function formalizing their purchase models, the guarantee function providing the quality image by reducing the feeling of risk, the personalization function allowing the consumers to locate themselves in their social environment, the entertainment function getting the consumers to motivate into the different brand choices, and the practical function allowing the consumers to learn and evaluate the results of different shopping experiences (TOPCU and UZUNDUMLU, 2012; AILAWADI *et al.*, 2011; ALDAZABAL *et al.*, 2006; GUERRERO *et al.*, 2000).

Not only has been consumed increasingly the ice cream by many consumer segments such as children, adolescents, adults and elder people during all the lifecycle due to their refreshing, sensational, nutritional and sanitarian attributes, on the other hand, but also the ice cream industry becoming a much profitable sub-sector owing to rapidly developing technological progresses has introduced 240 different types of ice cream resulting from the diverse ingredients and methods of freezing to the domestic markets under a strict competition between manufacturer and retailer in recent years (TOPCU and UZUNDUMLU, 2012; TURGUT and CAKMAKCI, 2009).

Therefore, the upmost motivation drives of the fundamental selection criteria in the ice cream purchase decision making process of all the consumers under various product depths and varieties are the brands. Therefore, it makes possible to distinguish among the consumers in terms of their sensitivity and loyalty to the brand highlighting the persistent purchase of a specific brand within a well-defined context and having a positive attitude towards it. In other word, there is a strong relationship between their varieties and brand types impacting on their purchase decisions (TOPCU, 2012a; ENNEKING *et al.*, 2007; GUERRERO *et al.*, 2000).

The brand type or names of the food products could be generally explained in two categories as the manufacturer brands created by manufacturers and bearing their chosen brand name (the local, national, international and global brands) and private label products derived and owned by retailers functioning at a distribution channel (the store/retailer, store sub-brand, generic and individual product brands) (TOPCU *et al.*, 2008). The effects of the brand types associated with the food choice and acceptability, and the consumers purchase attitude and behaviors were widely studied in marketing researches (FORNERINO and HAUTEVILLE, 2010; ZHOU *et al.*, 2010; GEHLHAR *et al.*, 2009; KUMAR *et al.*, 2009; TOPCU *et al.*, 2009; DIMOFTE *et al.*, 2008; ENNEKING *et al.*, 2007).

[1] Ice cream has a complex food colloidal system including in air bubbles, ice crystals and partially destabilized fat globules dispersed in a continuous aqueous phase. Therefore, its manufacturing as the most popular frozen dairy dessert has fairly complex processes and follows the subsequent steps such as preparation of the mixture, pasteurization, homogenization, cooling, aging of the mixture, addition of fermented milk, freezing, packaging and storage of the final mixture (SOUKOULIS *et al.* 2010).

Table 1 - Annual production, export, import, consumption (million liters) and per capita consumption amounts (liter) of ice cream, and macroeconomic indicators in Turkey.

Items and macroeconomic indicators	2000	2005	2010	2012	Annual change(%) 2005-2012
Production	60.0	113.0	324.0	260.0	7.1
Export	-	4.0	8.0	12.0	8.3
Import	-	0.8	0.2	1.5	5.8
Consumption	-	99.0	229.0	247.0	7.5
Per capita consumption	1.0	1.5	3.0	4.0	7.8
Population (million)	67.8	72.1	73.7	75.6	0.6
Grow rate of GDP (%)	6.8	8.4	9.2	2.1	2.9
Grow rate of GDP per capita (%)	5.3	7.1	7.5	0.8	1.9

Sources: (TUIK, 2013 and 2013a; ASUD, 2013).

The brands of the leader manufacturer manufacturing the ice cream with the national and international brands in Turkey consist of Unilever's Algida, Ulker's Natura, Has Food's Panda, Dinamik Food's Alaska, Izmir Dairy Products' MEMO, Nestlé's Nestle, Yasar Food's MADO and Ferah Food's EDO (FOOD, 2009). Their annual production, export, import, consumption and per capita consumption amounts of the ice cream along with some macroeconomic indicators in Turkey are indicated in Table 1.

According to Table 1, as considered the annual increasing production (7.1%), consumption (7.5%) and export (8.3%) trends between 2005 and 2012; it should be increased dramatically the domestic production amount responding to the needs and willingness to buy of Turkish consumers. Additionally, the annual increase rate in the consumer population (0.6%) and Gross Domestic Product (GDP) per capita (1.9%) between 2005 and 2012 in Turkey could increase considerably its consumption trends. Furthermore, it has been estimated that the ice cream consumption at selected European markets reported by MGMN for Turkey will also increase about 64% between 2012 and 2016.

Annual ice cream consumption amounts per capita of the leader countries such as New-Zealand, US, Finland and Sweden in the ice cream consumption in 2012, on the other hand; were calculated as 25, 21, 14 and 12 liters, respectively (FIIND, 2013). Furthermore, those per capita in Turkey, EU and the world in 2012 were calculated as 4, 12 and 6.0 liters, respectively (EICA, 2013; FAOSTAT, 2013; TUIK, 2013).

As a result of all this, compared with the consumers of the leader countries in the ice cream consumption, Turkish consumers have consumed about 3-6 times less ice cream than them, but this difference has continued to increase steadily. According to all the indicators, the ice cream production should be increased to be able to meet the increasing demands of Turkish consumers at domestic food markets.

In order to increase considerably the annual ice cream consumption amounts of Turkish consumers, traditional sensory analysis should be combined with integrated marketing approaches focused on the intrinsic and extrinsic ice cream attributes, and then they should develop/design the marketing tactic and strategies under homogenous consumer segments based on their socioeconomic characteristics. There is not any integrated scientific research taking into consideration all the conceptual frameworks with regard to the ice cream purchase decisions for the target consumers segments in the scientific literature. With the present study focused on integrated marketing approaches combined with all the factors influencing on the ice cream purchase decision making process of Turkish consumers, it could be filled an important gap in the literature by contributing considerably to the scientific literature.

This study, therefore, was designed to reach all the objectives mentioned above. In this scope, the main aims of the study are to explore the core factors related to the intrinsic and extrinsic product attributes impacting on the national-branded ice cream purchase decisions of Turkish consumers; and then to determine the target homogenous consumer segments based on their socioeconomic characteristics, and finally to analyze the effectiveness of the factors effecting on their consumption amounts.

MATERIAL AND METHODS

Material

The primary data used in this study which include in the variables based on the national-branded ice cream attributes and Turkish consumers' socioeconomic characteristics influencing on their consumption decisions and amounts were obtained from a face-to face questionnaire in Kahramanmaras[2] from autumn of 2012 until winter of 2013. The questionnaire was conducted with the heads of the households in their houses. The participants consuming the national-branded ice

[2] Kahramanmaras is located in the southeastern part of Turkey. The province lies on plain at the foot of the Taurus Mountains and has a total population of 1.063.174 in 2013, and about 42% of those live in the city centre.

cream, and accepting the voluntary contribution were selected randomly. They have demographic and socioeconomic characteristics such as average 46 years old, $1282 income, 3.7 liters ice cream consumption, 4.3 family sizes 51% male population and 61% high school education.

Methods

Method used in determination of the sample size

In order to determine the sample size, while minimizing sample bias and representing correctly the population; the city center was divided into four parts covering the west, east, south and north-sides of Kahramanmaras with 73.929 households consisting of about six family members (APDK 2013; TUIK 2013).

In order to calculate the sample size for each district, the following formula was used (TOPCU *et al*. 2010).

$$n = \frac{Z^2 * p * (1-p)}{c^2} = 385$$

Where

n = sample size
Z = z value, (1.96 for 95% confidence level)
p = percentage making a choice, (0.5 used for sample size needed)
c = confidence interval, (used 0.05 = ±5)

The minimum sample size having the capability of representing the main population was calculated as 385 households (but the study was conducted with 400 households). By considering the information obtained from the food science and marketing literature under the expert consultancy and the prior experiences of the researcher, a draft questionnaire was prepared (TOPCU, 2012). In order to check out non-sampling error which occurs due to ambiguous definitions, unclear instructions, questionnaire wording, format and length, a pre-test was carried out 15 consumers selected randomly in the target regions. The flow and nature of the questionnaire were tested, and the order and timing of the questions were re-arranged. The questionnaire was then modified and refined before starting the fieldwork.

Methods used in the preparation of the questionnaires

It was asked the participants in the survey to respond to each statement indicating the significance levels of the ice cream attributes by using a *Likert-format* with 1-5 scale (where 1 refers to the least important and 5 refer to the most important attribute). Of eighteen ice cream attributes, five are related to the intrinsic ice cream attributes (ingredient quality, texture and aroma, taste and flavor, hardness and viscosity and organic content); six are covered by the extrinsic food attribute referring the marketing mix (the region of origin, advertisement and promotion, package material and appearance, product assortment, quality-price relation and price); two are determined by manufacturing process (the reliability of manufacturing process and food safety and hygiene); five are stated by the relationships between the consumer and marketing environments (brand recognition, store satisfaction and confidence, manufacturer brand satisfaction and image). The sources in the literature related to the intrinsic and extrinsic ice cream attributes and their items were showed in Table 2.

On the other hand, of the two string and three numeric variables referring to the consumer demographic and socioeconomic characteristics, three referred to the consumer demographic characteristics (age as a numeric variable; consumer education (0: primary and 1: high school and college graduate) and the occupation (0: others and 1: officer) as string variables); two included in the consumer socioeconomic characteristics (monthly consumer income ($) and the share of the ice cream expenditure within total food one as numeric variable).

Methods used in the statistics analyses

After editing and coding, the primary data were first used in *Principal Component Analysis (PCA)*[3] to determine the main factors related to the product attitudes influencing on the national ice cream purchase patterns of Turkish consumers. *PCA* is a data reduction technique that reduces the number of variables used in an analysis by creating new variables (called factors) that combine redundancy in the data (SPSS 15.0 2006). The first step in *PCA* is to determine the number of relevant factors. This was conducted by *PCA* using *Varimax Rotation Method (VRM)*[4]. *PCA* was used initially to identify underlying aspects explaining a correlation among a set of the food product attributes. The purpose of *PCA* was to identify those attributes accounting for a relatively large proportion of the variance in the sample.

In the second and final steps of the statistics analyses, the main factors obtained from *PCA* were used for *k-means cluster and multiple regression/correlation MRC Analyses,* respectively. In the second step, according to

[3] A factor extraction method used to form uncorrelated linear combinations of the observed variables. The first component has the maximum variance. Successive components explain progressively smaller portions of the variance and are all uncorrelated with each other. *PCA* is used to obtain the initial factor solution. It can be used when there is a single correlation matrix.

[4] This method is an orthogonal rotation method that minimizes the number of variables that have high loading on each factor. It simplifies the interpretation of the factors.

Table 2 - The sources in literature related to the macro variables and their items.

Macro variables	Items	Sources
Intrinsic product attributes	Texture and aroma	SOUKOULIS *et al*., 2010; CRUZ *et al*., 2009 OZDEMIR *et al*., 2005; AIME *et al*., 2001
	Taste and flavor	TOPCU and UZUNDUMLU 2012; SOUKOULIS *et al*., 2010; TURGUT and CAKMAKCI, 2009; ENNEKING *et al*., 2007
	Ice cream content	SOUKOULIS *et al*., 2010; TURGUT and CAKMAKCI, 2009; ALVAREZ *et al*., 2005
	Hardness and viscosity	ATSAN and CAGLAR, 2008; KAYACIER and DOGAN, 2006; GRANGER *et al*., 2005
	Ingredient quality	KARAMAN *et al*., 2011; FARHOOSH and RIAZI, 2007; GRANGER *et al*., 2005
	Food safety and hygiene	TOPCU and UZUNDUMLU, 2012; GOFF, 2008; ROININEN *et al*., 1999
Extrinsic product attributes	Actual image quality	TOPCU and UZUNDUMLU, 2012; SIRO *et al*., 2008; WILDMOSER *et al*., 2004
	Ice cream assortment	SOUKOULIS *et al*., 2010; LANGE *et al*., 1999; GOFF, 2008
	Brand recognition	AILAWADI *et al*., 2011; GEHLHAR *et al*., 2009; WULF *et al*., 2005
	Store satisfaction	TOPCU and UZUNDUMLU, 2009; TOPCU *et al*., 2008; WULF *et al*., 2005; GUERRERO *et al*., 2000
	Store confidence	TOPCU and UZUNDUMLU, 2009; SOBERMAN and PARKER, 2006; GUERRERO *et al*., 2000
	Brand satisfaction	AILAWADI *et al*., 2011; DIMOFTE *et al*., 2008; STRIZHAKOVA *et al*., 2008
	Brand image	TOPCU, 2012; KUMAR *et al*., 2009; BRAKUS *et al*., 2009; LI and HOUSTEN, 2001
	Package appearance	TOPCU and UZUNDUMLU, 2012; TOPCU and ISIK, 2008; ENNEKING *et al*., 2007
	Promotion mix	KARRAY and MARTIN-HARRAN, 2009; TOPCU and ISIK, 2008; LI and HOUSTEN, 2001
	Price and quality relation	TOPCU and UZUNDUMLU, 2012; AMROUCHE and ZACCOUR, 2009; KUMAR *et al*., 2009; WOLK and SPANN, 2008; ENNEKING *et al*., 2007
	Region/country of origin	REALINI *et al*., 2013; BATRA *et al*., 2010; TOPCU *et al*., 2010; ORTH and FIRBASOVA, 2003

monthly income levels of Turkish consumers, therefore, the target consumers were separated to three homogeneous clusters including in low-income users (less than $500 per month), middle-income users ($500-1250 per month) and high-income users (more than $1250 per month) (TOPCU 2012), and then the main factors were allocated to the homogeneous consumer clusters based on monthly income levels of the target consumers by *k-means cluster analysis.*

In the final step, the main factors obtained from *PCA* were used *Multiple Regression/Correlation (MRC) Analysis. MRC analysis* was used to measure the effects of variable factors delivered from the ice cream attributes and Turkish consumers' socioeconomic characteristics effecting on their ice cream amounts.

In order to test whether the normal distribution of the main factors delivered from *PCA* and the socioeconomic variables collected from the consumers exhibited or not was applied the various transformations techniques, and it was tested that the closest distribution to the normal of all the factors provided. On the other hand, the coefficient estimations were estimated by using *ordinary least squares (OLS).* Individual and group significance of these coefficients were tested using *t* and *F* tests, respectively.

In order to evaluate whether to be any econometrical problem among the variables, it was tested the overall *multicollinarity* and *auto-correlation* problems by considering *Variance-Inflating Factor (VIF)* and *Durbin-Watson d statistics*, respectively. *Multicollinearity* among variables was detected by calculating *(VIF)* (GUJARATI 2005; SPSS 15.0 2006). The analysis techniques have been widely used in many marketing researches with regard to the dairy food product attributes (DAVIES and CLINE, 2005; ISHII *et al.*, 2007; BATRA *et al.*, 2010; CADENA and BOLINI, 2011).

SPSS 15.0 statistical software program was used to run the *PCA* and *MRC* analyses. *MRC* model could be written as follows:

ICC = f (RPRS, TMNF, MBST, HQLT, SQLT, ETH, INC, EXP,OCU, EDU, AGE,)

Dependent Variable

ICC: Monthly national ice cream consumption amount per household (l/month)

Independent Variables

RPRS: Retailer prestige
TMNF: Trust to manufacturer
MBST: Manufacturer brand satisfaction
HQLT: Hedonic quality
SQLT: Sensory quality
ETH: Ethnocentrism
INC: Monthly consumer income ($)
EXP: The shares of the ice cream expenditures within total food ones
OCU: Consumer occupation
EDU: Consumer education
AGE: Consumer age

RESULTS AND DISCUSSION

Demographic and socioeconomic profiles of the participants

The results of descriptive statistics related to the gender, marital status, tasks in the family, education levels, occupation and age of the household heads, and monthly income, national-branded ice cream consumption and expenditure of the households attaining in questionnaire were indicated in Table 3. The results of the statistics showed that 51.0, 90.2, 47.1, 61.3 and 28.0% and 46.2 years

of the participant household heads consisted of the male, married, husband, high school graduate and retailer, respectively. On the other hand, monthly average income, ice cream expenditure, ice cream consumption amount and family size of the households were calculated as $1281.9, $48.6, 3.9 *l* and 4.3 individuals, respectively.

The results of PCA related to the ice cream consumption satisfaction

Kaiser Normalization (KMO) which compares partial correlation coefficients with observed ones was calculated as 0.87 for the ice cream attributes, and this means that the data set was at a perfect level for the factor analysis since the test score was greater than 0.50 (Table 4).

The principal component analysis using *VRM* grouped the eighteen variables related to the ice cream attributes into the six factors with Eigenvalues greater than 1.0, which these factors explained the 71.96% of the total variance. *F1* being the first of these factors was explained by 19.00% of the total variance, and consisted of the retailer/store positioning. *F1*, therefore, could be called by *retailer prestige (RPRS)* (TOPCU *et al.*, 2009). Explaining the 12.15% of the total variance, *F2* gave us information about the manufacturing process and the used material quality, and thus this factor could be determined by *trust to manufacturer (TMNF)* (TOPCU, 2012).

Reporting the 10.99% of the total variance, *F3* gathered together the variables related to the brand satisfaction, and it could be named as *manufacturer brand satisfaction (MBST)* (TOPCU and UZUNDUMLU, 2012). Referring to the 10.28% of the total variance, *F4* could be represented *hedonic quality (HQLT)* covering the relationship between the product quality and its price (TOPCU, 2012, 2012a). Considering the 10.08% of the total variance, *F5* was constituted by the sensory quality attributes of the ice cream, and could be entitled by *sensory quality (SQLT)* (TOPCU, 2012). Finally, referring the 7.20% of total variance, *F6* stated the relationship between the country of origin and the ice cream consumption with manufacturer brand, and thus it could be denominated by *ethnocentrism (ETH)* (ORTH and FIRBASOWA, 2003).

The results of cluster analysis related to the ice cream consumption satisfaction

The main factors derived from the *PCA* and effecting on the ice cream purchase decisions of Turkish consumers were separated into three homogeneous consumers segments through *k-means cluster* according to their income levels including in the low, middle and high-income users (Table 5).

Table 3 - Demographic and socioeconomic characteristics of the participants.

Demographic characteristics	Frequency	Percent	Cumulative	
Gender	400	100.0		
Male	204	51.0	51.0	
Female	196	49.0	100.0	
Marital status	400	100.0		
Married	360	90.2	90.2	
Not married	40	9.8	100.0	
Tasks in the family	400	100.0		
Husband	188	47.1	47.1	
Wife	212	52.9	100.0	
Education level	400	100.0		
First school	40	10.0	10.0	
High school	245	61.3	71.3	
College	115	28.7	100.0	
Occupation	400	100.0		
White-collar state employ	107	26.8	26.8	
Blue-collar state workers	50	12.5	39.3	
Businessman	40	10.0	49.3	
Retailer	112	28.0	77.3	
Pensioner	67	16.8	94.1	
Others	24	5.9	100.0	
Socioeconomic characteristics	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
Age	23.0	77.0	46.2	12.4
Monthly average income ($)*	190.0	3810.0	1281.9	1448.4
Ice cream consumption amount (l)	1.0	15.0	3.7	2.1
Monthly ice cream expenditure ($)*	2.0	200.0	48.6	36.5
Average family size	1.0	9.0	4.3	2.1

*The prices of the products were converted from Turkish Lira (TL) to US Dollar ($) using the exchange rate on February 25, 2014. The conversion rate used was 2.15 TL/$.

Table 4 - Factors and correlated variable loadings related to the ice cream attributes.

Variables	Factor loadings*					
	F1	F2	F3	F4	*F5*	*F6*
Retailer prestige (F1:RPRS)						
The ice cream assortment	**0.845**	0.048	0.032	-0.205	-0.061	0.249
Brand recognition	**0.727**	-0.343	-0.304	0.198	-0.005	-0.151
Store satisfaction	**0.640**	0.273	-0.086	-0.362	-0.222	-0.075
Store confidence	**0.558**	0.121	-0.214	-0.370	-0.051	-0.435
Advertisement and promotion	**0.532**	0.258	0.340	-0.210	0.070	-0.031
Trust to manufacturer (F2: TMNF)						
Ingredient quality of the ice cream	-0.056	**0.879**	0.126	0.054	-0.035	0.134
Food safety and hygiene	-0.009	**0.741**	-0.189	0.091	0.080	-0.210
Reliability of manufacturing process	-0.284	**0.729**	0.169	-0.052	-0.092	0.017
Manufacturer brand satisfaction (F3: MBST)						
Manufacturer brand satisfaction	-0.021	0.090	**0.828**	-0.053	0.058	-0.021
Package material and appearance	-0.090	-0.051	**0.790**	0.021	-0.200	0.091
Manufacturer brand image	0.368	0.220	**0.581**	0.230	0.450	0.098
Hedonic quality (F4:HQLT)						
Quality-price relation	-0.096	0.177	-0.186	**0.765**	0.031	-0.081
Product price	0.058	-0.088	0.196	**0.745**	-0.145	0.139
Sensory quality (F5: SQLT)						
Texture and aroma	0.112	0.035	0.094	-0.157	**0.866**	-0.097
Taste and flavor	-0.166	0.028	0.038	-0.097	**0.735**	-0.187
Organic content of the ice cream mix	-0.160	-0.172	-0.358	0.024	**0.731**	0.311
Hardness and viscosity	0.220	-0.202	0.220	-0.409	**0.516**	0.209
Ethnocentrism (F6: ETH)						
The region of the origin	0.025	0.070	-0.027	0.098	-0.002	**0.932**
Eigen-value	***3.230***	***2.449***	***1.868***	***1.748***	***1.713***	***1.223***
Share of explained variance (%)	19.00	14.41	10.99	10.28	10.08	***7.20***
Cumulative share of explained variance (%)	***19.00***	***33.41***	***44.40***	***54.68***	***64.76***	***71.96***
KMO (Kaiser-Meyer-Olkin) Statistic						***0.873***
Bartlett's test of Sphericity	***(Chi-square, df: 136): 2552.21 (p: 0.000)***					

*Bold numbers indicate the largest loading for each variable.

Table 5 - Final cluster centres and the number of cases in each cluster.

Main Factors	Clusters*		
	High-income users (C1)**	Middle-income users (C2)**	Low-income users (C3)**
RPRS (Retailer prestige)	-0.266	-0.586	0.991
TMNF (Trust to manufacturer)	0.276	0.256	-0.109
MBST (Manufacturer brand satisfaction)	0.813	-0.375	-0.599
HQLT (Hedonic quality)	0.301	-0.375	0.381
SQLT (Sensory quality)	-0.408	0.514	0.105
ETH (Ethnocentrism)	-0.332	0.380	-0.414
Number of total cases in each cluster ***	***140***	***187***	***73***
% of total cases in each cluster	***35%***	***47%***	***18%***

* Bold numbers indicate the largest final cluster centre scores for each factor.
** According to F statistics, the final cluster center scores were found very importance (p<0.01)
*** The total number of the cases (n): 400

The results of the study showed that *high-income users of the national-branded ice cream (C1)* formed their consumption satisfaction according to *trust to manufacturer (TMNF)* and *manufacturer brand satisfaction (MBST)* by taking into consideration *the manufacturer-branded ice cream willingness to buy* as an indicator of the main component of the hedonic quality attributes. The target homogeneous consumers in the *C1*, therefore, gave a much more attention to the manufacturer brand satisfaction on their purchase decision and satisfactions, and thus it could be designed/developed the manufacturer-branded ice creams for the target consumers at this segment.

The results of the study also indicated that *the middle-income users of the national-branded ice cream (C2)* focused on the purchase patterns constructed by a combination of the factors such as *the sensory quality (SQLT), trust to manufacturer (TMNF)* and *Ethnocentrism (ETH).* The consumers in *C2* provided much stronger purchase motivations for the private labels under trust to local manufacturers by emphasizing the core benefits of the ice cream based on the sensory quality attributes. It could be introduced the private labeled local ice creams for the target segments to the region retailers.

The results of the study explained that *the low-income users of the national-branded ice cream (C3)* tended to buy the ice cream with *retailer prestige (RPRS)* under *hedonic quality attributes (HQLT).* The target consumers in *C3* focused on the actual ice cream-imaged purchase decision and satisfactions based on the retailer/store brands. It could be presented, therefore, the retailer branded ice creams for this segment.

The results of MRC analysis with regard to the ice cream consumption amounts

VIF values calculated as 1.028 and 1.582 indicating the scores between 1.00 and 2.50 determining the acceptable reference range for *multicollinearity* problem showed that there was not it. *Durbin-Watson d statistics*, on the other hand, computed as 2.09 was not located between d_u *(1.89) and 4-*d_u *(1.65)*. There, therefore, was no problem related to *auto-correlation* in the *MRC* model (KALAYCI, 2005). According to these statistical test results diagnosing the econometrics problems, we could directly use this data set for the *MRC* model.

The determination coefficient *(Adj.*R^2*)* was calculated as 0.80 in the *MRC* model, this means that all the independent variables explained the 80% of the dependent variable. The *OLS* estimates of the model coefficients and other statistical measurements were presented in Table 6. The results of statistical measurements highlighted that the *F-statistic* rejecting the null hypothesis that makes all the coefficients equal to zero was calculated as 153.76 *(p<0.01)*. On the other hand, the partial regression coefficients of all the independent variables, except for those of *RPRS*, were statistically found to be meaningful *(p<0.00 and p<0.05)*. Their signs, moreover, were also found in conformity with economic theory. However, *RPRS* and *ETH* were not important statistically *(p=0.333 and p=0.384)*, and thus they were not evaluated for compliance with the economic theory. Additionally, they had no impact on the manufacturer/national-branded ice cream consumption amounts, and thus there was an inverse (negative) relationship between *ETH* and the consumption

Table 6 - The results of multiple linear regression (MRC) analysis.

n: 400 R2: 0.82 Adj R2: 0.80 F (11, 388): 153.76* dL=1.65 du=1.89 DW dh=2.09

Variables	Multiple linear regression model				Collinearity statistics		Correlations		
	Coefficients [a]	Sd.error	t_h-value	p-value	Tolerance	VIF	Zero-order	Partial	Part
Constant	0.672	1.729	4.437	0.000*	-	-	-	-	-
RPRS	0.023	0.099	0.970	0.333	0.866	1.154	0.196	0.049	0.021
TMNF	0.072	0.102	3.218	0.001*	0.973	1.028	0.011	0.161	0.075
MBST	0.045	0.095	1.996	0.047**	0.893	1.120	0.103	0.098	0.042
HQLT	0.066	0.077	2.503	0.010*	0.958	1.043	0.080	0.126	0.066
SQLT	0.090	0.091	4.045	0.000*	0.975	1.026	0.126	0.201	0.089
ETH	-0.019	0.089	-0.872	-0.384	0.968	1.033	-0.004	-0.044	-0.019
INC	0.080	0.511	2.944	0.003*	0.648	1.544	0.331	0.148	0.065
EXP	0.736	0.347	26.689	0.000*	0.632	1.582	0.358	0.305	0.385
OCU	0.062	0.379	2.281	0.018**	0.703	1.422	0.023	0.120	0.052
EDU	0.180	0.395	4.738	0.000*	0.648	1.543	0.081	0.106	0.048
AGE	0.424	0.018	18.958	0.000*	0.690	1.448	0.294	0.101	0.046

[a] Coefficients consist of the standardized coefficients.

*p<0.01 **p<0.05

amounts of the ice cream. The findings were supported by the similar results of some studies (BRAKUS *et al.*, 2009; TOPCU *et al.*, 2009; DIMOFTE *et al.*, 2008; STRIZHAKOVA *et al.*, 2008; ENNEKING *et al.*, 2007).

The results of the study indicated that of the six main factors, the four ones such as *SQLT*, *TMNF*, *HQLT* and *MBST* had an important effect on the national-branded ice cream consumption amount per household in *C2; C1* and *C2; C1*and *C3;* and *C1*, respectively. *SQLT* was regarded as their main determinant on their satisfaction after consumed, and thus it played an important role in this process for *C2* by providing much important information about the consumer satisfaction associating with the intrinsic ice cream attributes. The results were similar with respect to those of the studies carried out by TOPCU (2012); TOPCU (2012a); TOPCU and UZUNDUMLU (2009); ENNEKING *et al.* (2007); ISHII *et al* (2007); GUERRERO *et al.* (2000).

The results of the study also showed that there was a positive relationship between *TMNF* giving much important information about the manufacturing process to Turkish consumers, reducing their health concern related to the ice cream based on the manufacturer confidence constructed with its ingredient quality at the manufacturing process under hygienic conditions and their consumption decision and amounts. This caused the consumers to increase dramatically the ice cream consumption trends in *C1* and *C2* due to the safe and hygienic ice cream manufactured by the manufacturers. This findings were quite similar to the results reported by several researchers (TOPCU, 2012; TOPCU and UZUNDUMLU, 2012; TOPCU *et al.*, 2010; SOBERMAN and PARKER, 2006; SCHUILING and KAPFERER, 2004).

The results of the present study also reported that there was a string relationship between *HQLT* having a bigger impact effect on the consumer demands making possible the product differentiation through the quality and price rating in *C1* and *C3,* and their purchase decisions. The marketers could, therefore, separate target Turkish consumer masses into two homogenous segments, and then they could also stimulate much more effective marketing tactic and strategies for each segments (WOLK and SPANN, 2008; KUMAR *et al.*, 2009; TOPCU *et al.*, 2010; ZHOU *et al.*, 2010).

The results of the study also revealed that *MBST* provided attitudinally a positive motivation on the national-branded ice cream consumption amounts in *C1*, and it had a string relationship between *TMNF* and *HQLT* of the manufacturer-branded ice cream. As a result, *MBST* was of a strong linear relationship with these factors influencing on not only the ice cream purchase decision at the sale points but also its consumption satisfaction and amounts after consumed. There were a lot of the studies referring to the relationship between *MBST* and the food consumption amounts (TOPCU, 2012, TOPCU, 2012a; TOPCU and UZUNDUMLU, 2012; ZHOU *et al.*, 2010; AMROUCHE and ZACCOUR, 2009; STRIZHAKOVA *et al.*, 2008).

The results of this study also provided the important information about how the demographic and socioeconomic characteristics of Turkish consumers affected their purchase decision and attitudes towards the national-branded ice cream. In this research considering their distinctive characteristics, the results of the study also referred that the share of the ice cream expenditure within total food ones *(EXP),* age *(AGE)*, education *(EDU)*, income *(INC)* and occupation *(OCU)* of Turkish consumers had a much bigger effect on the ice cream consumption amounts than the other preference factors, especially, *EXP, AGE*, *EDU.* These findings were supported by results of previous researches based on the consumers purchase attitude and behaviors towards the food products (TOPCU, 2012; TOPCU and UZUNDUMLU, 2012; TOPCU *et al.*, 2010; ZHOU *et al.*, 2010; TOPCU *et al.*, 2009; DIMOFTE *et al.*, 2008; ENNEKING *et al.*, 2007; LI and HOUSTON, 2001).

CONCLUSIONS

In this study, the integrated approaches patterns based on not only the intrinsic and extrinsic attributes of the national-branded ice cream but also the socioeconomic characteristics of Turkish consumers impacting on their ice cream purchase decisions and consumption amounts were evaluated. The measurement results of the study highlighted clearly that the consumers in *C1, C2* and *C3* satisfied with the actual manufacturer brands linking between trust to manufacturer and the hedonic quality attributes, the individual private brands under trust to local manufacturers and the sensory ones, and the retailer brands emphasizing the hedonic ones on the ice cream purchase decision and consumption amounts, respectively. The manufacturers, retailers and marketers of the ice cream, therefore, should widely implement the manufacturer brand, the individual private label and the retailer brand for *C1, C2* and *C3*, respectively in order to be able to create the demand trend increases under the integrated marketing tactic and strategies affecting positively the ice cream purchase decisions and consumption amounts of the target consumer segments.

Although this study has some scientific merit for the academic and food manufacturing communities, there are some limitations. The results of this study have a limited generalizability since the data were obtained from only one city. If the survey is conducted nationally, more data will give more objective results about the purchase decisions of all the population. In future studies, furthermore, this model could be expanded to incorporate more factors and factor levels into the model.

REFERENCES

Ailawadi K.L., Neslin S.A. and Gedenk K. (2011). Pursuing the value-conscious consumer: Store brands versus national brand promotions. The Journal of Marketing 65 (1): 71-89.

Aime D.B., Arntfield S.D., Malcolmson L.J. and Ryland D. (2001). Textural analysis of fat reduced vanilla ice cream products. Food Research International 34: 237-246.

Aldazabal J, Martín-Meizosoa A, Martínez-Esnaolaa J.M. and Farr R. (2006). Deterministic model for ice cream solidification, Computational Materials Science 38 (1): 9-21.

Alvarez V.B., Wolters C.L., Vodovotz, Y. and Ji T. (2005). Physical properties of ice cream containing milk protein concentrates. Journal of Dairy Science 88 (3): 862-871.

Amrouche N. and Zaccour G. (2009). A shelf-space-dependent wholesale price when manufacturer and retailer brands compete. OR Spectrum 31: 361-383.

APDK (2013). Annual report, the data of Agricultural Provincial Directorate of Kahramanmaras, Turkey.

ASUD (2013). Ice cream-ice cream economy, Packed Dairy Products Industry Association (ASUD). Available: http://www.asuder.org.tr/dondurmaekonomisi.html

Atsan E. and Caglar A. (2008). The effect of different levels of stabilizers on some physical and organoleptic parameters of icecream. Journal of the Faculty of Agriculture 39 (2): 195-200.

Batra R, Ramaswamy V., Alden D.L., Steenkamp J.E.M and Ramachander S. (2010). Effects of brand local and nonlocal origin on consumer attitudes in developing countries. Journal of Consumer Psychology 9 (2): 83-95.

Brakus J.J, Schmitt B.H. and Zarantonello L. (2009). Brand experience: What is it? How do we measure it? And does it affect loyalty? Journal of Marketing 73 (3): 1-51.

Cadena R.S. and Bolini H.M. (2011). Time-intensity analysis and acceptance test for traditional and light vanilla ice cream. Food Research International 44: 677-683.

Cruz A.G., Antunes, A.E.C., Sousa A.L.O.P, Faria J.A.F. and Saad S.M.I. (2009). Ice-cream as a probiotic food carrier. Food Research International 42: 1233-1239.

Davies A. and Cline T.W. (2005). A consumer behavior approach to modelling monopolistic competition. Journal of Economic Psychology 26: 797-826.

Dimofte C.V., Johansson J.K. and Ronkainen I.A. (2008). Cognitive and affective reactions of American consumers to global brands. Journal of International Marketing 16 (1): 1-43.

EICA (2013). Ice cream market report, European Ice Cream Association. Available: http://www.euroglaces.com.

Enneking U., Neumann C. and Henneberg S. (2007). How important intrinsic and extrinsic product attributes affect purchase decision. Food Quality and Preference 18: 133-138.

Farhoosh and Riazi (2007).

FAOSTAT (2013). Food and Agriculture Organization of the United Nations (FAOSTAT): Production, consumption and trade. Available: http://faostat.fao.org/site.

FIIND (2013). New Zealand-world master in ice cream consumption. Available: http://www.food.industryindia.com

FOOD (2013). Overview of Turkish ice cream market. Available: http://www.21food.com

Fornerino M. and Hauteville F. (2010). How good does it taste? Is it the product or the brand? A contribution to brand equity evaluation. Journal of Product and Brand Management, 19 (1): 34-43.

Gehlhar M.J., Regmi A., Stefanou S.E. and Zoumas B.L. (2009). Brand leadership and product innovation as firm strategies in global food markets. Journal of Product and Brand Management 18 (2): 115-126.

Goff H.D. (2008). 65 years of ice cream science. International Dairy Journal 18: 754-758.

Granger C., Leger P., Barey P., Langendorff V. and Cansell M. (2005). Influence of formulation on the structural networks in ice cream. International Dairy Journal 15: 255-262.

Guerrero L., Colomer Y., Guardia M.D., Xicola J. and Clotet R. (2000). Consumer attitude towards store brands. Food Quality and Preference 11: 387-395.

Gujarati D (2005). Basic Econometrics. ISBN: 975-7860-99, Ref.-Publish: 33, Istanbul.

Ishii R., Kawaguchi H., Mahony M.O. and Rousseau B. (2007). Relating consumer and trained panels' discriminative sensitivities using vanilla flavored ice cream as a medium. Food Quality and Preference 18: 89-96.

Kalayci S. (2005). SPSS Applications, Multi-Variables Statistics Techniques, ISBN: 975-9091-14-3, First Edition, Asil Publish, Ankara.

Karaman S., Yilmaz M.T. and Kayacier A. (2011). Simplex lattice mixture design approach on the rheological behavior of glucomannan based salep-honey drink mixtures: An optimization study based on the sensory properties. Food Hydrocolloids 25 (5): 1319-1326.

Karray R. and Martin-Harran A. (2009). A compositional study on two current types of salep in Iran and their rheological properties as a function of concentration and temperature. Food Hydrocolloids 21: 660-666.

Kayacier A. and Dogan M. (2006). Rheological properties of some gums-salep mixed solutions. Journal of Food Engineering 72: 261-265.

Kumar A., Lee H.J. and Kim Y.K. (2009). Indian consumers' purchase intention toward a United States versus local brand. Journal of Business Research 62: 521-527.

Lange C. Rousseau F. and Issanchou S. (1999). Expectation, liking and purchase behaviour under economical constraint. Food Quality and Preference 10: 31-39.

Li H.S. and Houston J.E. (2001). Factors affecting consumer preferences for major food markets in Taiwan. Journal of Food Distribution Research 18 (1): 97-109.

McCarthy, M., Boer, M., O'Reilly, S. and Cotter, L. (2003). Factors influencing intention to purchase beef in the Irish market. Meat Science, 65, 1071-1083.

Menichelli E., Olsen N.V., Meyer C., and Næs T. (2012). Combining extrinsic and intrinsic information in consumer acceptance studies. Food Quality and Preference, 23 (2): 148-159.

MGMN, 2013. World of ice cream-repositioning strategies, Mintel Global Market Navigator (MGMN). Available: http://www.frozenfoodeurope.com/article/markets

Orth U.R. and Firbasova, Z. (2003). The role of consumer ethnocentrism in food product evaluation. Agribusiness 19 (2): 137–153.

Ozdemir C., Demirci M., Ozdemir S. and Sagdic, O. (2005). Production and some properties of yoghurt ice cream in Turkey. Journal of Nutrition Research and Food Science 60 (4): 353-472.

Realini C.E., Furnols M.F., Sañudo C, Montossi F., Oliver M.A. and Guerrero L. (2013). Spanish, French and British consumers' acceptability of Uruguayan beef, and consumers' beef choice associated with country of origin, finishing diet and meat price. Meat Science 95: 14-21.

Roininen K., Hteenmaki L.A. and Tuorila H. (1999). Quantification of consumer attitudes to health and hedonic characteristics of foods. Appetite 33: 71-88.

Schuiling I. and Kapferer J.N. (2004). Real differences between local and international brands: Implications for international marketers. Journal of International Marketing 12 (4): 97-112.

Simeone, M. and Marotta, G., (2010). Towards an integration of sensory research and marketing in new food products development: A theoretical and methodological review. African Journal of Business Management, 4 (19): 4207-4216.

Siro I., Kapolna E., Kapolna B. and Lugasi A. (2008). Functional food. Product development, marketing and consumer acceptance: A review. Appetite 51: 456–467.

Soberman D. and Parker P.M. (2006). The economics of quality-equivalent store brands. International Journal of Research in Marketing 23: 125-139.

Soukoulis C., Lyroni E. and Tzia C. (2010). Sensory profiling and hedonic judgment of probiotic ice cream as a function of hydrocolloids, yogurt and milk fat content. Food Science and Technology 43: 1351-1358.

SPSS Base 15.0 (2006). SPSS Base 15 User's Guide 11, p. 161. Chicago, IL.

Strizhakova Y., Coulter R.A. and Price L. (2008). Branded products as a passport to global citizenship: Perspective from developed and developing countries. Journal of International Marketing 16: 1-52.

Topcu Y. and Isik H.B. (2008).

Topcu Y., Isik H.B. and Uzundumlu A.S. (2008). Manufacturing brands vs. store brands: A case of liquid vegetable oil market. In: Proceedings of International Conference on Business Management and Economics, 95-115, 26-28 January, Erzurum, Turkey.

Topcu Y., Isik H.B. and Uzundumlu A.S. (2009). Turkish consumer attitudes toward food products: The case of Erzurum. Italian Journal of Food Science 21 (1): 37-50,

Topcu Y. and Uzundumlu A.S. (2009). Analysis of factors affecting customer retailer loyalty in Turkish food market: The case of Erzurum. Italian Journal of Food Science 21 (2): 157-169.

Topcu Y., Turhan B. and Uzundumlu A.S (2010). Analysis of factors affecting Turkish sunflower oil consumer behaviour. Italian Journal of Food Science 22 (2): 239-247.

Topcu Y. and Uzundumlu A.S. (2012). Turkish consumers' purchase attitude and behaviors towards Kahramanmaras type ice cream as a local branded product. African Journal of Business Management 6 (34): 9695-9703.

Topcu Y. 2012. The effects of the local products on the rural development under societal marketing orientation: the case of Erzurum Civil cheese. 10th National Agricultural Economics Congress. pp. 916-926. 5 September 2012. Konya, Turkey.

Topcu, Y. (2012a). Rural Development-Contemporary Issue and practices, In. R.S. Adisa (Eds.), the integrated marketing approach as a rural development tool. InTech-Open Access Publisher, ISBN: 978-953-307-942-4, 257-282.

Troy, D.J. and Kerry, J.P. (2010). Consumer perception and the role of science in the meat industry. Meat Science, 86, 214-226.

TUIK (2013). Agricultural production statistics, Turkey Statistical Institute. Available: http://report.tuik.gov.tr/reports/consumption

TUIK (2013a). 2013 Turkey population census, Turkey Statistical Institute. Available: http://report.tuik.gov.tr/reports/rwservlet?adnksdb2

Turgut T. and Cakmakci S. (2009). Investigation of the possible use of probiotics in ice cream manufacture. International Journal of Dairy Technology 62 (2): 444-451.

Wildmoser H. Scheiwiller J. and Windhad E.J. (2004). Impact ofdisperse microstructure on rheology and quality aspects of ice cream. Lebensm.-Wiss. u.-Technology 37: 881-891.

Wolk A. and Spann M. (2008). The effects of reference prices on bidding behavior in interactive pricing mechanisms. Journal of Interactive Marketing 22 (4): 3-18.

Wulf K., Odekerken-Schröder G., Goedertier F. and Ossel, G.V. (2005). Consumer perceptions of store brands versus national brands. Journal of Consumer Marketing 22 (4): 223-232.

Zhou L., Yang Z. and Hui M.K. (2010). Non-local or local brands? A multi-level investigation into confidence in brand origin identification and its strategic implications. Journal of the Academic Marketing Science 38: 202-218.

Paper Received November 29, 2013 Accepted April 26, 2014