# Investigation of the Personal, Social, and Economic Factors Influencing Consumers' Utility in Choosing Milk Packaging, Case Study: Rasht City

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## ABSTRACT

Packaging is considered as one of the sale attractions and motives. The impacts of socio-demographic variables on the customers' selection procedure are conceptually interesting and have several managerial interests. The present study aimed to identify the effective personal, social, and economic factors in choosing milk packaging type in the Rasht City. To this end, the options were categorized into 4 groups including "milk without packaging", "bagged milk", "packet milk" and "bottled milk". Data were gathered using a questionnaire and some interviews with people. Multinomial Logit Model was used as research method. The results of Hausman test indicated that the 4 groups of milk packaging were independent of each other and, therefore, the nested structure was not required. Results obtained from model estimates showed that age, gender, family size, educational level, and income variables were statistically significant. Among the variables, "family size" negatively affected selection of other alternatives over the reference group (bagged milk), while other variables had positive effect. Finally, marginal effects were calculated for all variables and for each group. After calculating the marginal effects for all variables of each group, it was observed that the dummy variable "gender" had the most marginal effect in packaged milk group.

**Keywords**: Bagged milk, Packet milk, Multinomial Logit Model, Probability Utility Function.

## INTRODUCTION

Nowadays, packaging is one of the main parameters which can increase sales and sale progress is one of the prominent factors to generate income and economic development of the countries around the world (Mousavi Shahroudi, 2011). Appropriate packaging is an effective tool to create buying tendency in customers and increase corporate profits (Doaee *et al*., 2008). Relationship between packaging and customer can be established through many variables such as color, pictures, design, shape, size, and so on (Kermaninezhad *et al*., 2006). Thus, it is responsible for attracting customer and increasing sales in addition to maintaining the product (Patsula, 2001). For the purpose of preserving the product, it is necessary to pay attention to the appropriate packaging materials and costs, which mostly have laboratory and technical aspects. Besides, to achieve the second aim, i.e. consumer attraction, using suitable color and design with highest influence has mainly psychological and sociological aspects (Ampuero and Villa, 2006).

Product packaging, in addition to protecting contents and enabling transport, handling, and storage, serves to attract the attention of potential consumers, influencing their willingness to buy and even increasing product acceptance once purchased (Rundh, 2005). Food product packaging is therefore a priority

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sales tool for manufacturers. This is reflected in the fact that packaging design is the most important marketing task in the case of many products (Dickson, 1994). This is because outward appearance is a key for capturing the potential consumer's attention (Silayoi and Speece, 2007) and thus encouraging product purchase (Bloch, 1995; Fenko *et al.*, 2010; Tuorila and Pangborn, 1988), since it has been proven to act as both a psychological and physical stimulus. (Reimann *et al.*, 2010).

Today, many studies underestimate the influence that food packaging has on potential buyers. It is known, for instance, that consumers are affected by product packaging shape (Becker *et al.*, 2011; Rebollar *et al.*, 2012), material (Mutsikiwa and Marumbwa, 2013), color (Ares and Deliza, 2010; Mohebbi, 2014), labelling (Charters *et al.*, 1999), labelling fonts (Orth *et al.*, 2010) and even weight (Piqueras-Fiszman and Spence, 2012). However, the relationship between packaging and a potential consumer is not fully understood.

To provide a model that shows marketing and factors affecting the decision to purchase and the choice of different forms of milk packaging, review of previous studies on these topics is imperative. Kraus *et al.* (2017) determined the role of gender, age, and education in the evaluation of multidimensional criteria of the purchase of functional products and most important motives for the purchase and consumption of functional food among consumers of different socio-demographic profiles. The results showed that gender, age, and education differentiated the criteria influencing the decision to purchase functional food. The analysis conducted revealed that groups of consumers were significantly different from each other in the evaluation of the significance of each of the variables in the selection of functional food. Socio-demographic factors differentiate the motivations for consumption of functional food. Romano *et al.* (2015) utilized a rating based conjoint analysis to investigate how Brazilian consumers perceive pomegranate juice by identifying the role of packaging attributes relevant to the consumer's

intention to purchase. The results showed that consumers valued information on the health benefits of antioxidants as well as on the technology, suggesting that both types of information may be relevant tools to increase the intention to purchase the product. Loose *et al.* (2013) analyzed the relative importance of product packaging format and preparation convenience for oysters on consumer choice and market share. The impact of product packaging and preparation convenience on consumer choice was analyzed relative to the traditional demand factors of price, region of origin, oyster species, health, environmental and quality claims. Price, preparation format, and species were the most important choice drivers, followed by region of origin and accompaniments, while packaging format and claims only had a minor influence on consumer choice. Yayar (2012) investigated packed and unpacked fluid milk consumption and preferences among Turkish households using multinomial logit model and data from a consumer survey. Results indicate that better educated household heads, higher income, and larger households, and households with children under seven years of age consumed more packed milk than others.

Although packaging industry is new in Iran, many studies have been conducted in this field due to understanding its importance. Below are samples of such studies:

Kohansal and Firoozzare (2013) investigated the factors affecting the primary choice of consumers in food purchasing in Mashhad city by applying cross section data of 201 households. Results of applying multinomial logit model illustrated that older respondents and females were more careful for health than young respondents and males. Also, results indicated that the households with high income and high educational levels were more likely to choose healthy foods. Features related to package appearance including size, color, design, shape, materials, portability, transferring information (label) and being eco-friendly were considered as 7 variables in a research conducted by Zarebaqiabad and Ayoobi (2013). Then, 5 groups including producer, customer, retailer, intermediates, and

recyclers were considered to select every variable. Next, the required items in choosing such variables for small and large agencies were pointed out by researchers. Bahreini *et al.* (2013) visited chain stores in Bushehr city and aimed to study the effect of packaging quality on behavior of food consumers. They concluded that consumers claimed that color, material, diversity and labeling with, respectively, 84%, 89.7%, 81.5%, and 79% of consumers claimed that color, material, diversity and labeling were the main factors influencing their buying behavior, respectively ("so much effective"). Moreover, results proved that there were significant differences between customers' attitudes toward the effect of packaging quality on their buying behavior based on their educational level, while such difference didn't exist based on the age.

The current study aimed to recognize personal, social, and economic features effective in individuals' preference to select packaging type as one of the marketing tools that encourages consumers to shop. The selected product was milk, due to packaging diversity, high nutritional value and wide variety of uses. Novelty of this study in comparison with other works in this field is that a few studies focused on effects of socio-economic and demographic factors on choosing packaging and focus is on appearance of packaging in most studies. Thus, this study will be useful for marketing and sales sector.

## MATERIALS AND METHODS

### Conceptual Framework

Regression models have continuous or discrete dependent variables. The models with discrete variable include regression models for binary and multiple responses. In multiple response regression models, responses are sequential such as Sequential Logit or Sequential Probit or non-sequential such as Nested Logit, Conditional Logit, Multinomial Probit and Multinominal Probit. The Multinomial Logit is among the econometric methods used to estimate equations in which dependent variable is a dummy variable and indicates more than two groups. In such equations, independent variables in any case can be similar to or different from the Generalized Logit Model (Schwab, 2002; Green, 2012). Multinomial logit models assume response counts at each level of covariate combination, as multinomial and multinomial counts at different covariate combinations are independent. The benefit of using multinomial logit model is that it models the odds of each category relative to a baseline category as a function of covariates, and it can test the equality of coefficients even if confounders are different, unlike the case of pair-wise logistics, where testing equality of coefficients requires assumptions about confounder effects (Fujimoto, 2005).

Considering the objective of this study, the different kinds of milk packaging in the Rasht city, as independent variables, were classified into bagged, packet, bottled, and without packaging. It should be noted that, there were other types of packaging including triangular packet, 200cc packet, glass bottles, and 200-cc plastic bottles. However, considering pre-test results and consumers' unwillingness to choose these kinds, the 4 previously mentioned types were selected for analyses. The Multinomial Logit Model was used to determine personal and social effective factors in milk packaging and impact of each factor on each group. It must be said that all variables were entered into the model linearly.

### The Multinomial Logit Model

General form of the Multinomial Logit Model is as follows:

$$Ln\Omega_{m|b} = Ln\frac{\Pr(y = m \mid x)}{\Pr(y = b \mid x)} = x\beta_{m|b}$$

For *m*=1,2,….,j                (1)

Where, $Ln\Omega$ is the dependent variable represents the probability of choosing the type of milk packaging, b is considered as

reference group for comparison, *m* shows different income groups (*m*=1, 2… j) and varies from 1 to j groups, *x* indicates descriptive variables of the model, and $\beta_{mb}$ shows estimated coefficients of the model. In the Multinomial Logit model, logarithmic ratio of every outcome will always be zero when it is compared with itself. The following equation expresses this issue. If such condition is true, effect of every variable also will be zero (Schwab, 2002).

$$Ln\Omega_{b|b}(x) = \ln 1 = 0 \Rightarrow \beta_{b|b} = 0 \quad (2)$$

To calculate the predicted probabilities in the Multinomial Logit Model, j equations can be solved as follows:

$$\Pr(y = m \mid x) = \frac{\exp(x\beta_{m|b})}{\sum_{j=1}^{J} \exp(x\beta_{j|b})} \quad (3)$$

Given that four milk packaging types (bagged, packet, bottled, and without packaging milk) were considered, the model was first estimated for reference group to investigate effective factors on packaging. If the first group is considered as reference, probability equations will be as follows:

$$\Pr(y = m \mid x) = \frac{\exp(x\beta_{m|1})}{\sum_{j=1}^{J} \exp(x\beta_{j|1})} \quad (4)$$

After solving the above equations, $\hat{\beta}_{3|1}$ and $\hat{\beta}_{2|1}$ estimates will be obtained, while $\hat{\beta}_{1|1}$ equals to zero. If model is written down by considering the second group as reference, probability equations will be as the follows:

$$\Pr(y = m \mid x) = \frac{\exp(x\beta_{m|2})}{\sum_{j=1}^{J} \exp(x\beta_{j|2})} \quad (5)$$

In this case, $\hat{\beta}_{1|2}$ and $\hat{\beta}_{3|2}$ estimates will be obtained after solving the probability equations and $\hat{\beta}_{2|2}$ will be zero. These parameters present similar predicted probabilities. Relative Risk Ratio (RRR) will be calculated through exponentiating the model coefficients with the number e ($\approx$

2.718) as base ($e^{coef}$) after determining the level of every descriptive variable effect on groups of milk packaging. This criterion (RRR) shows how the probability of preferring a group is different from that of the reference group through changing explanatory variable.

$$P(Y_i = j) = P_{ij} \rightarrow \frac{P_{ij}}{P_{io}} = \exp(x_{ij}\beta_j) \rightarrow riskratio \quad (6)$$

$$\frac{P'_{ij}}{P'_{i0}} = \exp((x_{ij} + 1)\beta_j) \quad (7)$$

$$\exp(\beta_j) = \frac{\frac{P'_{ij}}{P'_{i0}}}{\frac{P_{ij}}{P_{i0}}} \rightarrow RRR \quad (8)$$

When the RRR related to every descriptive variable is $> 1$, it indicates that if descriptive variable increases by 1 unit, the probability of preferring the comparison group increases by RRR coefficient in comparison with the reference group and vice versa. Finally, if RRR $< 1$, the reference group will be preferred by customers (Long, 1997).

The Multinomial Logit Model has an independent error which is explained by Extreme Value Distribution. Such errors in this model show an assumption called "Independence of Irrelevant Alternatives". According to this assumption, adding or omitting an alternative doesn't affect the probability of other alternatives. If the Multinomial Logit Model violates this assumption, estimated coefficients of the model will be biased and inconsistent. The Hausman or Hesyaoo method is used to test the assumption. In the Hausman method, statistics to evaluate irrelevant alternatives are obtained using equation (10):

$$H = (\hat{\beta}_R - \hat{\beta}_F^*)'[Va\hat{r}(\hat{\beta}_R) - Va\hat{r}(\hat{\beta}_F^*)]^{-1}$$
$$(\hat{\beta}_R - \hat{\beta}_F^*) \quad (9)$$

In the above equation, $\hat{\beta}_R$ and $\hat{\beta}_F^*$ are results of estimation of the model resulting

from omitting alternatives and results of presence of all alternatives, respectively (Schwab, 2002).

Parameters estimated in the Multinomial Logit Model as well as usual Logit can be interpreted for corresponding explanatory variables based on the possibility of choosing different j[th] modes. In other words, parameters in this model don't have direct and easy interpretation and just present direction of independent variables effect and not real changes levels and probabilities. Thus, marginal effects of explanatory variables are used for this purpose. Marginal effects of the explanatory variable are calculated through differentiating the probability functions and using the following relation:

$$ME = \frac{\sigma \Pr(y = m \mid x)}{\sigma x_k} = \Pr(y =$$

$$m \mid x)[\beta_{k,m|J} - \sum_{j=1}^{J} \beta_{k,j|J} \Pr(y = j \mid x)]$$

(10)

## The Data

Data of this analysis were based on household cross-sectional data collected by the researchers in Rasht city. The survey was carried out on consumers using face to face questionnaire. Statistical population contained all people who consumed milk and had independent income in Rasht city. Given that the population was large, simple random sampling was applied to collect data and sample size was determined using Cochran's formula. Finally, 118 persons were interviewed. In the questionnaire form, households answered questions about their choices of purchasing milk alternatives and provided socioeconomic information. Designed questionnaires were distributed and answered in February and March 2016. Data analysis and regression estimate were performed using SPSS22 and Stata12.

## RESULTS

### Socio-economic Characteristics of Consumers

The sample under study consisted of 75% male and 25% female respondents. Their age ranged from 21 to 79 years, with a mean age of 43 years. Thus, most of the participants were middle-aged. On Average, weekly consumption of milk was 3 liters. Moreover, the average monthly income was calculated at 14 million Rials. Respondents were 12% single and 88% married and 27%, 14%, 8%, 43% and 1% with high school, diploma and advanced diploma, bachelor, and master degrees, respectively, while 7% were illiterate. In terms of employment status, 49% of them were employee vs. 51% who were self-employed. The average family size was 3 persons. All variables of model are summarized in Table 1.

### Multinomial Logistic Regression, Estimates for Determinants of Milk Packaging

The first stage in estimating the Multinomial Logit Model is determining one of the milk packaging groups as reference group in order to measure probability of preferring other groups by respondents over the control group. We chose the group of bagged milk with the highest relative frequency (%33.1) as reference group. Ultimately, the Multinomial Logit Model was estimated to determine effective factors in choosing milk packaging type in Rasht and relevant results are reflected in Table 2. According to this Table, explanatory variables of age and gender were significant at %5 level while family size and income variables were significant at 10% level in "without packaging milk" group. Among effective variables on this group, RRR coefficient related to the "income" variable is greater than 1. Thus, if income increases by one unit, chance of preferring the bottled milk

**Table 1.** Descriptive statistics of explanatory variables.

| Variable | Code | Description | SD ± Mean |
|---|---|---|---|
| Age | - | Continuous variable | 12.17443 ± 42.7627 |
| Gender | 1 0 | Dummy variable which takes the value 1 if the respondent is man otherwise | 0.43237 ± 0.7542 |
| Family Size | - | Discrete variable | 1.1918 ± 3.2881 |
| Educational level | 0 5 | Illiterate master | 1.1514 ± 3.2034 |
| The average weekly consumption of milk | - | Continuous variable | 1.2395 ± 2.4364 |
| Job | 1 0 | Dummy variable which takes the value if the respondent is Employee otherwise | 0.3020 ± 0.4915 |
| Monthly Income | - | Continuous variable | 8011.378 ± 17088.983 |
| Marital status | 1 0 | Dummy variable which takes the value if the respondent is married otherwise | 0.32475 ± 0.8814 |

over bagged milk (as reference) will increase. If the RRR coefficient for family size variable is less than 1, chance of selecting bottled milk over bagged milk will decrease when a person is added to family members.

Based on Table 3, LR statistic value (49.81) is significant at 1%, which indicates significance of the model, generally. The Pseudo $R^2$ equals to 0.1523, which shows validity of the model.

We calculated the marginal effect of every explanatory variable in all 4 cases (Table 4). Marginal effect of significant variables of age, gender, and income were 0.007, 0.099 and 0.000008, respectively. Since these values are positive and when other conditions are held constant, chance of selecting "without packaging milk" will increase by 0.7% and 0.0008% as age and income variables increase, respectively. In addition, the marginal effect of gender variable is positive, which means that the probability of choosing "without packaging milk" increases by 9.9% as gender changes. The marginal effect of "family size" variable is -0.06, indicating that if family size

increases by one person, the probability of selecting "without packaging milk" will decrease by 6%.

In the packet milk group, the marginal positive effect is 0.12 for gender and 0.0000093 for income variable. Thus, it can be concluded that the chance of selecting "packet milk" will increase by 0.00093 if "income" variable increases by one unit. Also, if gender of people changes, the probability of choosing the "packet milk" will increase by 12 %.

The marginal negative effects for gender, family size, and educational level variables were calculated as -0.005, -0.017, and -0.015, showing that if any of the above mentioned variables increases by one unit, the probability of selecting the packet milk will decrease by 0.5, 1.7, and 1.5, respectively.

Eventually, the marginal effects of the "bottled milk" group for variables of family size and income were positive and, respectively, 0.032 and 0.0000036, indicating that the chance of selecting the "bottled milk" increases by 3.2% and 0.00036% as each of the mentioned

**Table 2.** The results of the Multinomial Logit model estimation.

| Groups | Variables name | Coefficient | Relative Risk Ratio(rrr) | Std. Err | Z- statistic | probability level |
|---|---|---|---|---|---|---|
| Without packaging milk | age | 0.0522291** | 1.053617** | 0.0299397 | 1.74 | 0.081 |
| | gender | 1.071295** | 2.919156** | 0.6267675 | 1.71 | 0.087 |
| | Family Size | -0.7494684* | 0.4726177* | 0.3034225 | -2.47 | 0.014 |
| | Educational level | 0.2619892 | 1.299515 | 0.3102808 | 0.84 | 0.398 |
| | Weekly consumption of milk | -0.1567249 | 0.8549392 | 0.2497836 | -0.63 | 0.53 |
| | Job | -0.4689362 | 0.6256675 | 0.7639478 | -0.61 | 0.539 |
| | Income | 0.0001283 | 1.000128* | 0.0000555 | 2.31 | 0.021 |
| | marital status | 1.01539 | 2.76044 | 1.243564 | 0.82 | 0.414 |
| | Constant | -3.476442 | 0.0309172 | 2.250599 | -1.54 | 0.122 |
| Bagged milk | | | As base | | | |
| Packet milk | age | 0.0007606* | 1.000761* | 0.0317056 | 0.02 | 0.981 |
| | gender | 1.138559** | 3.122265** | 0.6186393 | 1.84 | 0.066 |
| | Family Size | -0.5660708* | 0.5677519* | 0.2927775 | -1.93 | 0.053 |
| | Educational level | 0.10519* | 1.110922* | 0.3054801 | 0.34 | 0.731 |
| | Weekly consumption of milk | -0.2411622 | 0.7857142 | 0.2551218 | -0.95 | 0.345 |
| | Job | 0.3937868 | 1.482884 | 0.7467052 | 0.53 | 0.598 |
| | Income | 0.0001306* | 1.000131* | 0.0000547 | 2.39 | 0.017 |
| | marital status | 1.160284 | 3.190841 | 1.286757 | 0.9 | 0.367 |
| | Constant | -1.760281 | 0.1719965 | 2.209466 | -0.8 | 0.426 |
| Bottled milk | age | 0.0323187 | 1.032847 | 0.0287785 | 1.12 | 0.261 |
| | gender | 0.3894155 | 1.476118 | 0.6200566 | 0.63 | 0.53 |
| | Family Size | -0.619727* | 0.5380913* | 0.2899348 | -2.14 | 0.033 |
| | Educational level | 0.2702377 | 1.310276 | 0.2889801 | 0.94 | 0.350 |
| | Weekly consumption of milk | -0.1281758 | 0.8796987 | 0.2414929 | -0.53 | 0.596 |
| | Job | -0.8460979 | 0.429086 | 0.7457104 | -1.13 | 0.257 |
| | Income | 0.0001077* | 1.000108* | 0.0000538 | 2.00 | 0.045 |
| | marital status | -1.275372 | 0.279327 | 0.7907065 | -1.61 | 0.107 |
| | Constant | -0.1902002* | 0.8267936* | 1.925556 | -0.1 | 0.921 |

**Table 3.** Goodness of fit measures for Multinomial Logit model.

| Statistics | Value |
|---|---|
| Log-Like Full Model | -138.59419 |
| LR chi2(24) | 49.81 |
| Prob > chi2 | 0.0005 |
| Pseudo $R^2$ | 0.1523 |

**Table 4.** The marginal effects for significant explanatory variables in each group.

| Variable | without packaging milk | bagged milk | packet milk | bottled milk |
|---|---|---|---|---|
| age | 0.0075668 | -0.0049591 | -0.0054134 | 0.0028057 |
| gender | 0.0996732 | -0.1493594 | 0.1205473 | -0.0708611 |
| Family Size | -0.0627294 | 0.113163 | -0.0177699 | -0.0326645 |
| educational level | 0.0243127 | -0.037374 | -0.0151861 | 0.0282474 |
| Weekly consumption of milk | -0.0053532 | 0.03077 | -0.0272903 | 0.0018666 |
| Job | -0.0557448 | 0.05296 | 0.1617445 | -0.1589686 |
| Income | 0.00000847 | -0.0000214 | 0.00000937 | 0.0000036 |
| marital status | 0.1897252 | 0.037107 | 0.2116244 | -0.4384569 |

**Table 5.** The results of the Hausman test for IIA hypothesis.

| The group has been deleted | Value |
|---|---|
| without packaging milk | -188.55 |
| bagged milk | -438.05 |
| packet milk | -32.78 |
| bottled milk | 0.9232 |

variables increases by one unit. We used the Hausman test to examine independence of alternatives and the relevant results can be seen in Table 5. Statistic value in all groups is insignificant and $H_0$, which is based on independence of irrelevant alternatives, can't be rejected. Therefore, it can be concluded that the groups are independent and applying the Multinomial Logit Model in this case is appropriate.

**DISCUSSION**

Effective factors on preferring milk packaging are of great importance since success of many companies now and in the future rely on true understanding of such factors. The companies can increase their chance of success in today's competitive markets through categorizing such factors and investigating the effect of the categories on choosing the type of packaging. Moreover, if shortcomings related to marketing and its challenges are studied, it will be possible to develop production, create higher value added, and export the product.

In this study, we examined the personal, social, and economic factors influencing the buyers to select milk packaging. Types of packaging milk including "without packaging", "bagged", "packet" and "bottled" milk were dependent variables and the Multinomial Logit Model was used to recognize effective factors in choosing packaging and to determine degree of influence by every factor. The bagged milk was selected as the reference group, because of its highest usage frequency. A brief review on the results of this study and offered suggestions is as follows:

Since marginal effect of the "age" variable for "without packaging milk" group was positive and significant, the probability of its selecting increases as consumers' age increases. But, the marginal effect of the "age" variable for the "packet milk" group was negative, which shows that the probability of its selecting will decrease when buyers' age increases. The reason for such trend can be interpreted in this way that buyers often tend to consume "without packaging milk" when health issues become much more important and this type of milk is free of any preservatives and is produced fresh daily by local people. Thus, appropriate

packaging of "without packaging milk" can enhance the probability of its consumption. In addition, the marginal effect of educational level was negative in the case of packet milk and expresses that the probability of choosing packet milk decreases with higher level of education while other conditions remain constant. Similarly, it can be said that people become less interested in selecting the packet milk as educational level and awareness about preservatives raise. It is recommended to increase consumers' tendency to use the packet milk through enhancing their awareness about permitted preservatives through labelling detail information on the packaging. It should be mentioned that the educational level variable was not significant for other groups. The marginal effect of dummy variable of the gender was positive for both "without packaging milk" and "packet milk", indicating that the probability of selecting "without packaging milk" and "packet milk" groups increases in comparison with the "bagged milk". As can be seen, this effect level is more for the packet milk group and shows that women are more inclined to select this type of milk. Paying attention to this issue can be beneficial in market segmentation and determining target population policies. The marginal effect of "income" variable was positive for all groups and expressed that consumers were more willing to buy packet, bottled and without packaging types of milk, which were most expensive compared to the bagged milk. Given that most of the consumers were middle-income, it is suggested to consider reasonable prices for different kinds of milk packages. Thus, middle and low income people have the power to choose. The marginal effect of the family size variable was negative for packet and without packaging milk groups and positive for bottled milk, revealing that if the family size increases, the probability of choosing "without packaging milk" and packet milk will decline, in contrast to the bottled milk. Results of this study are similar to the results of studies such as Balogh *et al.* (2016), Kohansal and Firoozzare (2013), Yayar (2012), Gunden *et al.* (2011), Fakayode *et al.* (2010), and Celik *et*

*al.*, (2006). One finding of these studies is that socioeconomic and demographic factors can be important in determining consumer's preference.

Overall, results of this study showed that the personal, social, and economic characteristics of consumers affect the type of milk packaging. Because of the diversity of these characteristics in the consumer's society, it is suggested that packaging should have more variety. Also, due to the weight of personal, social, and economic characteristics of consumers, the combination of packaging should be considered. In other words, the market segmentation for all types of milk packaging should be considered based on the socio-economic characteristics of the market (consumers). Although some personal, social, and economic variables effective in the relative preferences of different kinds of milk packaging were presented in this research, the results can't express the complicated selection process by people and further studies are required to be performed in this field.

## REFERENCES

1. Ampuero, O. and Vila, N. 2006. Consumer Perceptions of Product Packaging. *J. Consum. Manage.*, B:100-102.
2. Ares, G. and Deliza, R. 2010. Studying the Influence of Package Shape and Color on Consumer Expectations of Milk Desserts Using Word Association and Conjoint Analysis. *Food Quality Prefer.*, **21:** 930–937.
3. Bahreini, R., Bahreini, V. and Farashbandi, R. 2013. Investigating the Effect of Packaging Quality on the Behavior of Food Products Consumer from Customers' Perspective Who Visit the Busher Province Chain Stores. *National Conference of Accounting and Management*, Shiraz.
4. Balogh, P., Békési, D., Gorton, M., Popp, J. and Lengyel, P. 2016. Consumer Willingness to Pay for Traditional Food Products. *Food Policy,* **61:** 176-184.
5. Becker, L., van Rompay, T. J. L., Schifferstein, H. N. J. and Galetzka, M. 2011. Tough Package, Strong Taste: The Influence of Packaging Design on Taste

Impressions and Product Evaluations. *Food Quality Prefer.*, **22**: 17–23.

6. Bloch, P. H. 1995. Seeking the Ideal Form: Product Design and Consumer Response. *J. Market.*, **59(3):** 16–29.

7. Celik, Y., Bilgic, A., Karli, B. and Celik, S. 2006. Factors Affecting Milk Consumption Pattern in Southern Anatolian Region: An Application of a Two-Stage Econometric Model. *Die Bodenkultur*, **57(2):** 57-64.

8. Charters, S., Lockshin, L. and Unwin, T. 1999. Consumer Responses to Wine Bottle Back Labels. *J. Wine Res.*, **10**: 183–195.

9. Dickson, P. R. 1994. *Marketing Management.* The Dryden Press, Austin.

10. Doaee, H. and Hosseini, Z. 2008. The Role of Marketing Mix Strategy in the Firm's Export Performance (with an Emphasis on Product Mix). *J. Commerc. Surveys*, **22.**

11. Fakayode, S. B., Omotesho, O. A. and Omoniwa, A. E. 2010. Economic Analysis of Rice Consumption Patterns in Nigeria. *J. Agr. Sci. Tech.*, **12:** 135-144.

12. Fenko, A., Schifferstein, H. N. J. and Hekkert, P. 2010. Shifts in Sensory Dominance between Various Stages of User-Product Interactions. *Appl. Ergonomics*, **41:** 34–40.

13. Fujimoto, K. 2005. From Women's College to Work: Inter-Organizational Networks in the Japanese Female Labor Market. *Soc. Sci. Res.*, **34:** 651–681.

14. Greene, W.H. 2012. *Econometric Analysis.* 7th Edition, ISBN: 978-0-13-139538-1, Pearson Prentice Hall, Upper Saddle River, NJ.

15. Gunden, C., Bilgic, A., Miran, B. and Karli, B. 2011. A Censored System of Demand Analysis to Unpacked and Prepackaged Milk Consumption in Turkey. *Quality Quantity*, **45**: 1273-1290.

16. Hausman, J. A. and Mcfadden, D. 1984. Specification Tests for the Multinomial Logit Model. *Econometrical*, **52:** 1219-1240.

17. Kermaninezhad, F., Torabi, Sh., Hamidkhani, P. and Khoubrou, Sh. 2006. *Packaging Design in Introduction.* Karin Press,Tehran.

18. Kohansal, M. R., and Firoozzare, A. 2013. Applying Multinomial Logit Model for Determining Socio-Economic Factors Affecting Major Choice of Consumers in Food Purchasing: The Case of Mashhad. *J. Agr. Sci. Tech.,* **15**: 1307-1317

19. Kraus, A., Annunziata, A. and Vecchio, R. 2017. Sociodemographic Factors Differentiating the Consumer and the Motivations for Functional Food Consumption. *J. Am. College Nutr.,* **36(2):** 116–126.

20. Long, J. S. 1997. *Regression Models for Categorical and Limited Dependent Variables.* SAGE Publications, Inc. London EC2A 4PU, United Kingdom.

21. Loose, S.M., Peschel, A. and Grebitus, C. 2013. Quantifying Effects of Convenience and Product Packaging on Consumer Preferences and Market Share of Seafood Products: The Case of Oysters. *Food Quality Prefer.*, **28**: 492-504.

22. Mohebbi, B. 2014. The Art of Packaging: An Investigation into the Role of Color in Packaging, Marketing, and Branding. *Int. J. Organiz. Leadership,* **3**: 92–102.

23. Mousavi Shahroudi, S. M. 2011. Determination and Prioritization of Factors Influencing the Development of Tile Export in Iran. *International Conference on Business and Economic Research,* Malasia.

24. Mutsikiwa, M. and Marumbwa, J. 2013. The Impact of Aesthetics Package Design Elements on Consumer Purchase Decisions: A Case of Locally Produced Dairy Products. *J. Business Manage.(IOSR-JBM),* **8(5):** 64–71.

25. Orth, U. R., Campana, D. and Malkewitz, K. 2010. Formation of Consumer Price Expectation Based on Package Design: Attractive and Quality Routes. *J. Market. Theory Practice*, **18(1):** 23–40.

26. Patsula, P. J. 2001. Successful Business Planning 30 Days: A Step-By-Step Guide for Writing a Business Plan and Starting Your Own Business. 3rd Edition, ISBN 0967840236: 3-24, Patsula Media, Portland.

27. Piqueras-Fiszman, B. and Spence, C. 2012. The Weight of the Container Influences Expected Satiety, Perceived Density, and Subsequent Expected Fullness. *Appetite*, **58(2):** 559–562.

28. Rebollar, R., Lidón, I., Serrano, A., Martín, J. and Fernández, M. J. 2012. Influence of Chewing Gum Packaging Design on Consumer Expectation and Willingness to Buy. An Analysis of Functional, Sensory and Experience Attributes. *Food Quality Prefer.*, **24**: 162–170.

29. Reimann, M., Zaichkowsky, J., Neuhaus, C., Bender, T. and Weber, B. 2010. Aesthetic

Package Design: A Behavioral, Neural, and Psychological Investigation. *J. Consum. Psychol.*, **20(4):** 431–441.

30. Romano, K. R., Rosenthal, A. and Deliza, R. 2015. How do Brazilian Consumers Perceive a Non-traditional and Innovative Fruit Juice? An Approach Looking at the Packaging. *Food Res. Int.*,**74**: 123-130.

31. Rundh, B. 2005. The Multi-faceted Dimension of Packaging. Marketing Logistic or Marketing Tool? *Br. Food J.*, *107(9):* 670–684.

32. Schwab, J.A. 2002. Multinomial Logistic Regression: Basic Relationships and Complete Problems. Http: //www.utexas.edu /courses/ schwab/ sw388r7/.

33. Silayoi, P. and Speece, M. 2007. The Importance of Packaging Attributes: A Conjoint Analysis Approach. *Eur. J. Market.*, **41(11):** 1495–1517.

34. Tuorila, H. and Pangborn, R. M. 1988. Prediction of Reported Consumption of Selected Fat-Containing Foods. *Appetite*, **11(2):** 81–95.

35. Yayar, R. 2012. Consumer Characteristics Influencing Milk Consumption Prefrence. The Turkey Case. *Theor. Appl. Econ.*, **7(572):** 25-42.

36. Zarebaqiabad, F. and Ayoobi, M. 2013. Investigating the Different Sizes of Packaging and Its Role in Developing Higher Sales in Small and Medium Sized Enterprises. *First National MBA Conference,* Kerman.

## بررسی عوامل فردی، اجتماعی و اقتصادی موثر بر مطلوبیت مصرف کنندگان در انتخاب بسته بندی شیر، مطالعه موردی: شهر رشت

م. مجاوریان و پ. تنکبار

## چکیده

بسته بندی یکی از جاذبه ها و محرک‌های فروش محسوب می شود. درنظرگرفتن متغیرهای اجتماعی— جمعیت شناختی در فرایند انتخاب مصرف‌کننده بطور مفهومی جالب بوده و منافع مدیریتی متعددی دارد. . هدف از مطالعه حاضر، شناسایی عوامل فردی، اجتماعی و اقتصادی مؤثر در انتخاب بسته بندی شیر در شهر رشت است. برای این منظور انتخاب‌ها به 4 گروه شیر بدون بسته بندی (شیر فله)، شیر کیسه ای، شیر پاکتی و شیر بطری طبقه بندی شدند واطلاعات مورد نیاز از طریق تکمیل پرسشنامه و مصاحبه حضوری با افراد جمع آوری شد. روش مورد استفاده در این مطالعه، الگوی لاجیت چندگانه می‌باشد. نتایج حاصل ازانجام آزمون هاسمن حکایت ازاین امر دارد که چهارگروه بسته بندی شیر مستقل از هم بوده و نیازی به آشیانه سازی نیست. نتایج به دست آمده از برآورد مدل نشان داد که متغیرهای سن، جنسیت، تعداد اعضای خانوار، تحصیلات، درآمداز لحاظ آماری معنادار می‌باشند که در این میان متغیر تعداد اعضای خانوار اثر منفی بر انتخاب سایر گزینه‌ها نسبت به گزینه پایه دارد و سایر متغیرها اثر مثبتی دارند. درنهایت، اثرات نهایی برای تمام متغیرها در هریک ازگروه‌های بسته بندی شیرمحاسبه گردید و مشاهده شد که متغیر موهومی جنسیت در گروه شیر پاکتی بیشتری اثر نهایی را دارا می‌باشد.