



## **The Effect of Packaging on Consumers' Purchase of Food Products in Selçuklu District of Konya**

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**ABSTRACT:** The aim of the study is to determine the importance of packaging on consumer buying behavior. The data used in the study were conducted on a voluntary basis using the survey technique. The sample size of the study is 100 according to the probability sampling method of households located in the Selçuklu district of Konya province, Turkey. The reliability of the data prepared to determine the effect of packaging on consumer tendency to buy food products was determined by Cronbach's Alpha test. In the study, the Kaiser-Meyer-Olkin (KMO) test value was found to be 0.776. In order to develop the scale, the factor analysis method was used which renders a large number of variables as statistically significant and independent factors. As a result of the analyses performed, five factors were identified towards the effect of packaging features on consumers' purchase of the food products. In the light of the data obtained from the study, it was concluded that the factors affecting the consumers' decision to buy any product were factors such as packaging's usage, appearance, healthiness, and its recyclability. The decisiveness of packaging attributes in consumer's purchase decision was determined by factor analysis and the effect of packaging on consumer's purchase of food products was examined by regression analysis along with other factors (income, age, education). According to the results of the regression analysis, it was determined that the effect of the packaging was higher on the consumers with higher income and education. It is seen that for consumers who think that the image of packaging and its ease of use are positive in the eyes of the consumers, the packaging is more effective in their purchase of food products compared to other consumers. The most important feature among the packaging of food products affecting consumer purchasing decisions is that the production and expiry information is in an easily visible position.

**Keywords:** Packaging, Purchase Behavior, Purchase Decision, Factor Analysis, Regression Analysis

### **Konya İli Selçuklu İlçesinde Tüketicilerin Gıda Ürünleri Satın Almada Ambalajın Etkisi**

**Öz:** Çalışmanın amacı, tüketicilerin gıda ürünleri satın alma davranışları üzerinde, ambalajın önemini belirlemektir. Araştırmada kullanılan veriler anket tekniği kullanılarak gönüllülük esasına göre yapılmıştır. Çalışmanın örnek hacmi Konya iline bağlı Selçuklu ilçesinde yaşayan hane halklarının olasılık örnekleme yönteminde göre 100 olarak belirlenmiştir. Tüketicilerin gıda ürünlerini satın alma eğilimlerinde ambalajın etkisini belirlemek üzere hazırlanan verilerin güvenilirliği Cronbach's Alpha testi ile belirlenmiştir. Çalışmada Kaiser-Meyer-Olkin (KMO) test değeri 0,776 olarak tespit edilmiştir. Ölçeği geliştirebilmek için, çok sayıdaki değişkeni az sayıda, anlamlı ve birbirinden bağımsız faktörler haline getiren faktör analizi metodu kullanılmıştır. Yapılan analizler sonucunda tüketicilerin gıda ürünleri satın almada ambalajın özelliklerine yönelik beş faktör belirlenmiştir. Çalışmadan elde edilen veriler ışığında tüketicilerin herhangi bir ürünü satın alma kararını etkileyen faktörlerin; ambalajın kullanımı, ambalajın sağlıklı olması, ambalajın görünümü ve ambalajın geri dönüşüm özelliği gibi faktörler olduğu sonucuna varılmıştır. Tüketicilerin satın almada ambalaj özellikleri faktör analizi ile belirlenmiş ve diğer faktörlerle (gelir, yaş, eğitim) birlikte tüketicilerin gıda ürünleri satın almada ambalajın etkisi regresyon analizi ile incelenmiştir. Yapılan regresyon analizi sonuçlarına göre gelir ve eğitim durumu daha yüksek olan tüketicilerde ambalajın etkisinin daha fazla olduğu tespit edilmiştir. Ambalajın sağlıklı olmasının, tüketici gözünde ambalaj imajının ve ambalajın kullanım kolaylığının olumlu olduğunu düşünen tüketicilerde diğer tüketicilere göre gıda ürünleri satın almada ambalajın daha etkili olduğu görülmüştür. Tüketicilerin satın alma kararlarını etkileyen gıda ürünleri ambalajları arasında en önemli özelliğin üretim ve son kullanma bilgilerinin kolay görülebilir konumda olmasıdır.

**Anahtar Kelimeler:** Ambalaj, Satın Alma Davranışı, Satın Alma Kararı, Faktör Analizi, Regresyon Analizi

**1.Introduction**

The packaging in food products has an importance beyond the protection of the product, the transportation of certain distances and the prevention of deterioration, to carry certain distances and to prevent deterioration. Because, packaging of food products has become an effective concept in their purchasing decision by addressing the feelings of consumers today. A package is a material that ensures the protection, storage, transportation and even the promotion of the product. By protecting the product not only protects the product from external factors but also increases its appeal. It is also an indispensable product in order to prolong the shelf life of foods, to store them in suitable conditions, to protect the food from other contaminants until they reach the consumer and to provide hygiene (Oluç, 1957; Alagöz ve Ekici, 2009; Arıkan, 2010).

The aim of this study is to determine why consumers prefer packaged products when buying food products, what they think about the packaging products, what they expect from the packaging of the product and the extent to which the packaging is affected.

**2.Material and Method**

The primary material of the study was the primary data obtained from the surveyed consumers in the Selçuklu district of Konya province, Turkey. In the theoretical part of the study, the studies and statistics released by various institutions and organizations were also used.

Probability sampling was used to determine the sample size of the study. (Oguz ve Karakayaci, 2017).

$$n = \frac{Np(1 - p)}{(N - 1)\sigma_{p_x}^2 + p(1 - p)} \tag{1}$$

n=sample size, N=population size(According to the address-based population registration system of 2015, the total population living in Konya-Selçuklu district was taken as 604,706) p-value was taken as 0.5.  $\sigma_{p_x}^2=(d/t)^2$  (in order to reach a certain sample size, table value was determined to be (d=1.96) and (t=0.10) with the standard deviation of 10% and within the confidence

interval 95 %. Since the characteristics of the consumers that make up the target population were not known at the beginning, the sample volume was taken as p = 0.5 and the sample size was found to be 100 (Oguz ve Karakayaci, 2017). The interviewed consumers were randomly selected by the simple random sampling method. The data obtained were transferred onto the Excel and analyzed on SPSS 22 software.

In order to determine the effect of food packaging on consumer buying behavior question were asked using a 5-point Likert scale. Questions according to the Likert Scale were applied as (5: Very important 4: Important 3: So-so 2: Less important 1: Not important) (Mühlbacher ve Juhnke, 2013). The sample size was divided into 4 different income groups according to households included in the study. A survey was conducted with total 100 consumers: 24 consumers in the income group of 0-1500 TL, 36 in the income group of 1501-3000 TL, 21 in the income group of 3001-4500 TL and 19 in the income group in the income group of 4501 and above. The relationship between household income and other variables (Consumers' food products shopping places and consumers' food products shopping frequencies) in Selçuklu district of Konya province was used the chi-square test. Chi-Square test is performed to determine if the numbers obtained from sampling are appropriate for the target population or in other words; it is performed to see if the observed values are appropriate for the expected values (Kalaycı, 2018). The chi-square test statistic was calculated by the following formula:

$$X^2 = \sum_{j=1}^c \sum_{i=1}^r \frac{(G_{ij} - E_{ij})^2}{E_{ij}} \tag{2}$$

If  $X^2 > X_{\alpha; (r-1)*(c-1)}^2$  then reject  $H_0$  hypothesis. ( $H_1$  hypothesis is accepted).

If  $X^2 < X_{\alpha; (r-1)*(c-1)}^2$ , then accept  $H_0$  hypothesis ( $H_1$  hypothesis is rejected).

$H_0$ : There isn't significant relationship between the variables.

$H_1$ : There is a significant relationship between the variables.

$\alpha$ : Detected Probability of Error (Level of

Significance).

At the determined level of significant significance, if the value corresponding to the degree of freedom (DF) in the Chi-square table is less than the  $X^2$  value, there is a relationship between the variables, and if it is greater, it is concluded that there is no relationship (Kartal, 1998).

KMO test was used to analyze the data and Cronbach's alpha reliability test and factor analysis was performed (Büyüköztürk, 2002; Tavşancıl, 2002; Kalaycı, 2018).

The effect of packaging on consumers' purchase of food products is estimated by logistic regression analysis. The logistic regression model is appropriate for this study and it has been determined in literature that it is frequently used in analyzing similar data (Oğuz ve Kan, 2009; Hasdemir, 2011; Ünlüer ve Güneş, 2013; Gençdal ve ark., 2015; Özer ve Özden, 2016; Abay ve ark., 2017). Logistic regression analysis is a two-pronged model in which dependent or explanatory variable is composed of binary responses such as yes-no, success-fail, important-unimportant and encoded as 0-1 (Özdamar, 1999; Greene, 2003; Kalaycı, 2018).

The general functional representation of the logistic regression models is given below (Gujarati, 2009);

$$F(BXi) = \frac{\exp(BXi + \epsilon i)}{(1 + \exp(BXi + \epsilon i))} \quad (3)$$

The dependent variable is whether the use of packaging is important or not.

B = The coefficient vector of the explanatory variables

Xi = Number of explanatory variables

$\epsilon i$  = Error term

The probability of the decisiveness of factors affecting the significance of packaging;

$$Pi = \frac{1}{(1 + e^{xi})} \quad (4)$$

Pi = Probability of the dependent variable

e = 10-base natural logarithm and is approximately 2.30.

Zi = B0 + BiXi

$$Pi = \frac{Pi}{1 - Pi} + \frac{1 + e^{xi}}{1 + e^{xi}} = e^{xi} \quad (5)$$

H<sub>0</sub>= There isn't significant relationship between the use of packaging and other variables (Education, age, income, the production packaging from healthy material, label placed on packaging, image of packaging in the eyes of consumers, physical appearance of packaging, packaging ease of use)

H<sub>1</sub>= There is a significant relationship between the use of packaging and other variables (Education, age, income, the production packaging from healthy material, label placed on packaging, image of packaging in the eyes of consumers, physical appearance of packaging, packaging ease of use)

### 3. Results and Discussion

#### 3.1. Socio-Demographic Characteristics of the Consumers

Certain socio-demographic characteristics of the population were determined according to their gender, age, educational status, occupational status, social security, and marital status. According to the age groups of the households in the study field, 68.17% is between 15-49 age group and 19.63% are over 50 age group. As can be understood from this, the majority of the surveyed population is between the ages of 15-49. In parallel to this majority, those whose income level is between 3001 TL-4500 TL participated with a higher rate (68.17%) in the study. 47.59% of the population in the households were male and 52.41% were female. The majority of the households (37.93%) were females aged between 15 and 49 years old. In a related study conducted by Dilber ve ark. (2012) in Karaman province, 54.20% of the participants were female and 45.80% were male. In the research area, 23.77% of the population is primary school graduates, 13.39% are secondary school graduates, 22.95% are high school graduates, 29.78% are university graduates, 10.11% are postgraduate students or graduates. In the research area, it has been determined that education increases in line with the income level. In a similar study carried out by Teke (2014) in Mamak district of Ankara province, it was stated

that 43.60% of the students were high school graduates according to their socio-demographic attributes.

It was determined that the social security of the respondents in the research region was mostly through Social security (SSI) institution (Table 2)

**Table 1.** Demographic Characteristics of Consumers'

*Çizelge 1. Tüketicilerin demografik özellikleri*

Income Rate	Average Age of the Consumer' (year)	Average Training Time of the Consumer' (year)	Average Number of Individuals in the Family(person)	Average Income Status (TL)	Total Consumer' (person)
0-1500	41,08	9,38	3,54	1247,92	24
1501-3000	31,94	13,75	3,81	2419,44	36
3001-4500	30,24	14,95	3,86	3828,57	21
4501-+	43,79	17,31	3,89	6963,16	19
Average	36,76	13,85	3,77	3614,77	

**Table 2.** Social Security Status of Consumers' (%)

*Çizelge 2. Tüketicilerin Sosyal Güvence Durumu (%)*

Income Rate	SSI (%)	Bag-kur (%)	Retirement fund (%)	Green Card (%)	Total
0-1500	68.24	21.18	3.53	7.06	100.00
1501-3000	75.18	16.06	8.76	-	100.00
3001-4500	35.80	11.11	53.09	-	100.00
4501-+	21.62	5.41	72.97	-	100.00
Ratio to Total Population	54.64	14.06	29.71	1.59	100.00

### 3.2. Consumer Behavior According to Income Levels

In the research area, the place where households shop according to their income groups is given in table 3. It is seen that consumers prefer supermarkets (82%) as their income increases. Among the reasons for the

preference of consumers, it is seen that they can make plenty, clean, high quality products and collective shopping. Similarly, in the study conducted by Bahşi ve Budak (2014) in Adana province, it is seen that 46% of consumers go to supermarkets for food shopping.

**Table 3.** Consumers' Food Products Shopping Places

*Çizelge 3. Tüketicilerin Gıda Ürünleri Alışveriş Yerleri*

Income Rate	Street Saler		District Bazaar		Greengrocer		Supermarket		Grocer		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
0-1500	1	4.17	5	20.83	1	4.17	16	66.67	1	4.17	24	100.00
1501-3000	-	0.00	4	11.11	2	5.56	28	77.78	2	5.56	36	100.00
3001-4500	-	0.00	-	0.00	-	0.00	21	100.00	-	0.00	21	100.00
4501-+	-	0.00	-	0.00	2	10.53	17	89.47	-	0.00	19	100.00
Average	1	1.00	9	9.00	5	5.00	82	82.00	3	3.00	100	100.00

**Table 4.** Consumers' Food Products Shopping frequencies

*Çizelge 4. Tüketicilerin Gıda Ürünleri Alışveriş sıklıkları*

Income Rate	more than once a week		once a week		Longer time intervals		Total	
	No	%	No	%	No	%	No	%
0-1500	3	12.50	13	54.17	8	33.33	24	100.00
1501-3000	7	19.44	18	50.00	11	30.56	36	100.00
3001-4500	6	28.57	9	42.86	6	28.57	21	100.00
4501-+	11	57.89	6	31.58	2	10.53	19	100.00
Average	27	27.00	46	46.00	27	27.00	100	100.00

X<sup>2</sup>=196,780<sup>a</sup> important at P<0,01

**3.3. Packaging Factor in Consumers' Purchase of Food Products**

In the study, it was determined that the packaging properties of food products were significantly effective in consumer preference (Table 5). According to the consumers, the

production and expiry date can be easily visible, the product is well protected against external influences, the packaging is not produced from harmful substances and the packaging is very important to be appropriate to the characteristics of the product contained in the package.

**Table 5.** Food Product Packaging Characteristics Affecting Consumers' Purchase Decisions

*Çizelge 5. Tüketicilerin Satın Alma Kararlarını Etkileyen Gıda Ürünleri Ambalaj Özellikleri*

	0-1500	1501-3000	3001-4500	4501-+	Average
1. The Easy Being visible location of production and expiration information	4,54	4,72	4,38	4,68	4,60
2. Good Protection Against External Effects	3,75	4,61	4,48	5,00	4,45
3. The packaging is not produced by the substance harmful to health	3,63	4,47	4,38	4,89	4,33
4. Eligibility of the product contained in the packaging	4,46	4,36	3,95	4,42	4,31
5. Easy To Be Opened	4,38	4,39	4,19	4,16	4,30
6. Material and Quality of Packaging	3,54	4,58	4,05	4,89	4,28
7. Durability	3,46	4,39	4,24	4,89	4,23
8. Being Readable Text of packaging on it	4,25	4,19	4,00	4,26	4,18
9. Made from Recycled Material	4,25	3,97	3,90	4,11	4,05
10. Reclosing After Unpacking	4,25	3,97	3,90	4,05	4,04
11. Easy To Be Portable	4,04	4,14	3,95	3,89	4,03
12. Having Usage Information on	4,00	4,08	4,05	3,95	4,03
13. Ease of Use	4,08	4,03	3,71	4,00	3,97
14. Receiving Information about the Manufacturer and Origin on Packaging	4,13	3,75	3,71	4,05	3,89
15. Color Shape Design Appearance	3,79	4,08	3,29	3,16	3,67
16. Packaging can be used for other purposes after the product is finished	3,88	3,42	3,62	3,42	3,57
17. Packaging Is Interesting	3,88	3,58	3,43	2,95	3,50
18. Not much space	3,67	3,50	2,86	3,53	3,41
19. Dimensions	3,79	3,17	3,10	3,53	3,37
20. Stance of the product on the Market Shelf	3,63	2,67	3,00	2,79	2,99

(5: Very important 4: Important 3: So-so 2: Less important 1: Not important)

KMO test value of the data regarding the packaging attributes of the food products affecting consumer buying decisions was found to be 0.776 (Table 6). The result shows that the distribution of data is appropriate for factor analysis. Barlett's test of sphericity was found to be significant at 944.125 ( $p < 0.001$ ) and data were from multivariate normal distribution.

In order to obtain information about the structural validity of the study on the packaging attributes of food products affecting consumer buying decision, the principal components analysis was made by varimax rotation method. As shown in Figure 1, the Initial Eigenvalues is taken as one and five factors were determined as a result of repeated factor analysis. These five factors represent 66.38% of the general

population (Table 6).



**Figure 1.** Aggregation Graph of Factor Analysis  
*Şekil 1. Faktör Analizinin yığılma grafiği*

As a result of the factor analysis, loads of the 5 factors ranged from 0.488 to 0.856. According to the factor analysis, 5 variables showing how differently packaging is perceived by the

consumers (the production packaging from healthy material, label placed on packaging, image of packaging in the eyes of consumers, physical appearance of packaging, packaging ease of use) were determined. As given in Table 7, in the variables consisting of 20 items and 5

factors, 4 items for the production packaging from healthy material, 5 items for the label placed on packaging, 4 items for the image of packaging in the eyes of consumers, 4 items for its physical appearance and 4 items for its ease of use were identified.

**Table 6.** Total Variant Quantities Explained

**Çizelge 6.** Açıklanan Toplam Varyans Miktarları

Factor	Initial Eigenvalues			Extraction Sums of Square Loadings			Rotation Sums of Squared Loadings		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	6.059	30.295	30.295	6.059	30.295	30.295	2.969	14.845	14.845
2	3.049	15.245	45.541	3.049	15.245	45.541	2.932	14.662	29.506
3	1.758	8.792	54.333	1.758	8.792	54.333	2.832	14.159	43.665
4	1.341	6.703	61.036	1.341	6.703	61.036	2.584	12.918	56.583
5	1.068	5.342	66.378	1.068	5.342	66.378	1.959	9.795	66.378
6	.913	4.564	70.942						
...									
20	.141	.705	100.000						
Kaiser-Meyer-Olkin Measure of Sampling Adequacy							0.776		
Bartlett's Test of Sphericity							Aprox. Chi-Square		
							df		
							Sig.		
							944.125		
							190		
							0.000		

**Table 7.** Food Products Affecting Purchasing Decisions of Consumers Packaging Properties Factor Structure

**Çizelge 7.** Tüketicilerin Satın Alma Kararlarını Etkileyen Gıda Ürünleri Ambalaj Özellikleri Faktör Yapısı

Sub-Groups of the Scale	Scale Items (SI) and Factor Loads	Items
The production Packaging from Healthy Material (Factor I)	SI 13 (0,856), SI 19 (0,809), SI 3 (0,808), SI 1 (0,756)	4
Label Placed on Packaging (Factor II)	SI 14 (0,815), SI 8 (0,779), SI 6 (0,712), SI 12 (0,694), SI 16 (0,488)	5
Image of Packaging in the Eyes of Consumers (Factor III)	SI 17 (0,780), SI 20 (0,749), SI 15 (0,707) , SI 2 (0,590)	4
Physical Appearance of Packaging (Factor IV)	SI 18 (0,728), SI 7 (0,714), SI 9 (0,681), SI 10 (0,624)	4
Packaging Ease of use (Factor V)	SI 5 (0,805), SI 11 (0,689), SI 4 (0,604)	3

In this part of the study, the influence of the packaging attributes affecting the consumer buying decision on the factors such as education, income, healthiness of the packaging, the label on it, its appearance, use, and packaging expectations were examined.

Logistic regression results are given in Table 8. In the model 5 of the 8 factors examined were found to be statistically significant. According to the results of regression analysis; variables such as education, consumer income, the production of packaging from a healthy material, the image of

the packaging in the eyes of the consumer and the ease of use of the packaging seem to increase the importance of packaging when buying food products. When all other conditions remain constant, it is determined that the importance of given to packaging increased in accordance with their education and income level. If the education of the consumer increases by 1 unit, the tendency to buy packaged products increases 9.751 times. It is seen that for consumers who believe that the production packaging from healthy material and its ease of use and image of packaging in the eyes

of consumers are positive in the eyes of the consumers, the packaging is more important in their purchase of food products compared to

other consumers. If the ease of use of packaging increases by one unit, purchasing of packaged products will increase 2,157 times.

**Table 8.** Logistic regression analysis results

**Çizelge 8.** *Logistic regresyon analizi sonuçları*

Name of Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Education	2,277	0,598	14,507	1	<b>0,000*</b>	9,751
Age	0,000	0,032	0,000	1	0,988	1,000
Income	2,513	0,844	8,858	1	<b>0,003*</b>	0,081
The production Packaging from Healthy Material	1,892	0,740	6,532	1	<b>0,011*</b>	6,630
Label Placed on Packaging	0,470	0,501	0,882	1	0,348	1,600
Image of Packaging in the Eyes of Consumers	0,877	0,386	5,167	1	<b>0,023*</b>	2,404
Physical Appearance of Packaging	0,660	0,371	3,170	1	0,075	1,935
Packaging Ease of use	0,769	0,370	4,320	1	<b>0,038*</b>	2,157
Constant	0,730	1,654	0,194	1	0,659	2,074

\*p<0,05.

#### 4. Conclusion

In the study, it was determined that the consumers in the research area gave importance to the production and expiry dates on the packaging while purchasing food products and this was followed by the fact that the product was well protected against external influences.

When the general behaviors of the consumers are examined, the attributes of the packaging such as the production packaging from healthy material, the labels that they think should be on the packaging, the attractiveness, physical appearance and the use of it can be listed. Therefore, it is important to take into account the attributes deemed important by the consumers in the production and use of food packages.

In the study, it was determined that there were significant positive-positive relationships between education level, consumer income, healthy production of packaging, image of packaging in consumer eye, ease of use of packaging and importance given to packaging. It was determined that consumers prefer packaged products when buying food products.

The information on the packaging affects the purchasing behavior of the consumer and the importance given to the packaging increases as the level of education and income of the consumer increases. The reason for this is the increase in the level of quality awareness. As consumers' qualifications increase, manufacturers need to pay more attention to quality and packaging. If the importance of

packaging is understood by the enterprises, it will be possible to obtain increases in sales through improvement works.

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