

# Consumer Attitudes Towards Organic Food Applications, Environmental Issues and Genetically Modified Organisms (GMOs)

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## Abstract

Consumer interests towards the organic products is increasing in line with the increase in the variety of supplies despite the recent economic crisis. Organic food consumption is greatest in the developed countries like the USA and the Europe, however a rising trend is observed all over the the world. This qualitative study aims to investigate the tendency of Turkish organic food consumers by means of face to face interviews with participants in organic bazaars. 56% of respondents are females, whereas 44% of them are males and they are aged between 16 to 80. Our study reveals that health and the environmental awereness are the main factors on consumer's decision to purchase organic food. The results of our research also indicate that organic food consumers may follow a trend, in which initial perceptions are augmented over time by food security, future of nature, environmental ethics and sustainability of health. Food safety, which can be perceived as non-use of chemicals and synthetics is the foremost consideration for Turkish organic consumers on food consumption decisions. The information gathered in this study can contribute to the development of scales for measuring consumer food preferences and the desire of staying healthy.

**Keywords:** Factor Analysis, Consumer Tendency, Organic Foods, ANOVA, Conventional Foods, Chemicals, Environmental Issue, Consumer Perception

## 1.Introduction

Organic production constitutes still only a small percentage of agricultural sales in the world, but it has been growing steadily in the last few decades. The worldwide increasing trend in the consumption of organic food continues despite the recent global financial crisis. According to the forecasts of Organic Trade Association, a rapid growth of nine percent or more annually is expected for organic agriculture in the coming years. While the consumption of organic food is greatest in the USA and the European Union (EU) countries, the share of organic food is also increasing in many developing countries (Schleenbecker and Hamm, 2013). Organic foods have become widely available in most food shops in many countries of the world. Although they need to compete with conventional products in supermarkets, there is a growing interest to the organic products as they become more diversified.

Researchers try to examine the main reasons that are influential on the decisions of consumers to buy organic food or to prevent them from purchasing organic food (Makatouni, 1999 ; Davies et al., 1995, Grunert and Juhl, 1995 ; Hutchins and Greenhalg, 1997). In this context, consumer perception of organic food and attitudes are important on the purchase decision. According to Soil Association (2000), consumers perceive organic food as food without any chemicals and growth hormones and is grown with natural methods. In organic farming, synthetic pesticides and chemical fertilizers are not allowed, and organic foods are not produced by using industrial solvents or synthetic food additives.

Health issues are one of the most important factors on the decision of consumers to choose organic foods. Health issues still constitute a growing concern for many consumers all around the world due to increasing number of diseases without any cure. Consumers view organic food healthier as they perceive them having lower pesticides and fertiliser residues (Makatouni, 1999 ; Morris, 1996 ; Davies et al., 1995, Yiridoe at.al, 2005, Hughner et al., 2007). Negative attitudes of consumers towards genetically modified (GM) food is another reason of purchasing organic food in some product categories. Most people believe that GM foods are unreliable due to their unknown consequences on human health and environment (Bredahl, 1999). Although most consumers want GM foods to be labelled, majority of the GM foods do not provide any information about their ingredients. As Wibeck (1998) states, this is one of the key factors of on the decisions of people to purchase organic food based on their fear of loosing control over their own lives.

Health is not the only factor which has a significant effect on food choices. Accordingly, concentrating only on health may overlook many other motives that can be important on consumer purchase decision. In addition to health reasons, better taste, being natural and being free from genetic modifications and food additives are other common motivations of consumers for buying organic food. Increasing concern about environmental issues and ethical issues are some other influential reasons affecting the consumer decision. Awareness of their contribution to the future of our planet by not using artificial fertilisers and pesticides, which increase harvest at the expense of environment, has become one of the important motivations among people to consume organic food. Additionally, as Honkanen and Frewer (2009) indicate, sensory motives such as appearance, taste and smell are also considered as one of the most effective determinants of consumer food choice in Europe. Falguera et al. (2012) emphasize consumers' interests about the social and environmental consequences of their consumption attitudes, as well as the growing preoccupations about living healthier lifestyles, which cause important changes on the whole food habits of consumers especially in recent times.

Since factors such as age, gender and socioeconomic backgrounds are highly effective on beliefs and attitudes of people, these differences are reflected on the food-related beliefs and food choices of people as well. It is a generally accepted finding that women place more value than men to health, natural content, ethical concerns and sensory appeal. According to results obtained by Steptoe and Wardle (1992), female respondents from different regions of Europe have healthier behavioral patterns and healthier dietary habits than men. Thompson and Kidwell (1998) studied the socio-demographic profiles of organic product consumers. They indicate that they are mainly women, who purchase organic products in larger amounts and more frequently than men. The presence of children in the family is an important motivator, positively influencing organic purchase decision. Additionally, participation of a new born baby to the family is maybe one of the most important reasons behind the changing eating habits of families and the growing interest to the organic foods. Consequently, women are more sensitive and more concerned with the organic foods than men in general and they are more likely to eat organic food.

On the other hand, as Makatouni (2002) underlines, although many people emphasize their interest in organic food, they do not purchase organic food, which indicates the discrepancy between positive attitude and behaviour. A variety of consumer studies in Europe and US indicate that moral considerations have a significant influence on the decision to purchase organic food. According to these studies, moral decision situation can be depicted as a situation in which a person is aware that well-beings of other people depends on their acts and the consequences of their acts so that they feel responsible for their acts (Davies, Foxall and Pallister, 2002 ; Bahr et al., 2004 ; Baker et al., 2004). On the other hand, researchers like Saba, Rosatti and Vasallo (2000) and Saba and Rosatti (2002) could not find any significant relationship between moral considerations and purchase of organic food. According to Hamm et al. (2002) this result is not surprising since moral issues may play a more important role in countries where organic food consumption is more familiar to consumers than in countries with less mature organic markets. As Arvola et al. (2008) emphasize, studies on organic food indicate that purchase of organic food is not considered as a moral imperative by the consumers and therefore they do not feel guilty for choosing a conventional product. Undoubtedly, more studies on the consumers' cognitive structures and their impact on the purchase decision will clarify the unknown factors that are effective on the consumers' organic food purchase decisions.

Being expensive, difficulty in availability, satisfaction with conventional food, limited choice, and lack of perceived value and trust are some of the major reasons which prevent consumers from purchasing organic food despite rising interest. The biggest handicap that prevents the growth of organic food market is the added cost of sustainable practices. It is a fact that the cost of organic food is much higher than the conventional food because the intensive management and labor used in organic production are generally more expensive than that of growing the conventional foods. Another key reason preventing consumers from purchasing organic products is lack of availability when they do their shopping. Supporting this claim, Silverstone (1993) states that price and availability are the main reasons of a reversal in favourable attitude towards organic products. However, according to Pearson (2014), although organic foods are often significantly more expensive than conventionally produced equivalents, scientific research indicates that higher prices may not act as a deterrent to the increased consumption of organics at least in certain product categories. Some consumers think that price is a sign of quality and the reasons why people choose conventional over organic is not always high prices but the value consumers place on organic food. Consequently, consumers can be convinced to purchase organic food more easily by showing them that organic products deserve higher prices.

The overall objective of this study is to provide a detailed understanding of consumer purchasing behaviour concerning the organic food. In this context, we try to obtain further understanding about Turkish consumers'

perceptions of organic foods. From another perspective, it tries to investigate the beliefs and attitudes of organic food buyers to evaluate their impacts on purchase decision. In this study, we will try to examine whether the motivations of organic food consumers are initially derived from personal health reasons or from ethical and environmental beliefs or all together. Additionally, this research aims to reveal the most important attributes of organic food that are considered as important for consumers who regularly purchase organic food. While doing that, this study will try to identify the most important personal values of consumers in evaluating these attributes.

In this research, we try to evaluate consumer behaviours concerning the applications of genetically modified (GM) foods, organic foods in general and to what extent consumers are interested in purchasing organic foods with their limited financial capacity. In our study, we also analyzed gender, age and educational differences on the attitudes of people towards the organic food consumption. Furthermore, we also studied the possible relationships between the consumers' interests for natural foods, their environmental awarenesses and healthy life (Roininen et al., 1999; Magnusson and Hursti, 2002, Fulguera et al., 2012) and attitudes towards organic foods' prices.

## 2.Method

### 2.1.Respondents

682 people, who are aged between 16 and 80 years old were chosen by the method of random selection from the national population. We adopted simple random sampling method as a sampling method. In accordance with the purpose of the research, we performed the interviews in all organic bazaars which are located in Istanbul, Turkey. Interviewees were talked face to face during April and June 2011. The total number of respondents is 682. While 44% interviewees are men, 56% of them are women. The respondents are quite unevenly separated across age groups; 16-25 years old (3%), 26-35 years old (29%), 36-45 years old (33%), 45-55 years old (27%), 56-65 years old (8%). The household income levels of the interviewees were as follows : 5.000 Turkish Liras (TL) (15%), 4.000 TL (10%), 3.000 TL (10.3%), 2.000 TL (7.6%), 6.000 TL (6.7%), 7.000 TL (6.5%), 15.000 TL (1.2%), 40.000 TL (0.1%). When we analyze the education levels of the participants, we see that 57% of them are either university students or have bachelor's degrees. 21% of them are high school graduates, 13.8% of them are postgraduates, 4.4% are elementary school graduates, 2.9% of them are secondary school graduates and 0.9% of them are unschooled.

### 2.2. Questionnaire

The questionnaire is comprised of questions concerning the attitudes of consumers towards the consumption and the purchase of organic food based on some different factors such as their attitudes towards the prices of organic foods, their tastes, information about environmental pollution and food habits in general.

Firstly, the questionnaire states the definition of organic food. Organic term states not only to the food itself, but also how it is produced. Because organic production methods emphasize the use of renewable production by the use of organic farming, resources and the conservation methods for soil and water, organic food is also about the environmental concerns. It is widely believed that organic food minimizes risks related to health and the environmental issues. Although the organic food standards differ from country to country, organic production in general features cultural, biological, and mechanical practices that fosters cycling of resources, promotes ecological balance. It is additionally safe from toxicological contagion of synthetic chemicals and chemical fertilizers when compared to conventional food (Rosen, 2010).

#### 2.2.1. Questions

##### *General Attitudes About the Health and Food*

In this study, interviewees were asked to determine ten applications of organic food production on the basis of thirteen different constructs on five point unipolar scales (Table 1). For each set of applications, the interviewees were asked the following food applications on the following statements : "I am a vegetarian", "I prefer to eat salt-free foods" or "I use quite a little salt in meals", "I do exercise regularly", "I abstain from processed foods", "I often eat fruit and vegetable", "I rarely eat red meat", "I abstain from foods containing additives", "I undergo medical examination regularly", "I drink alcohol", "I smoke". All interviews were conducted by talking face to face with the participants and we also received their verbatim comments. All the interviewees expressed their admittances and voluntary participations into this study (Table 1).

##### *Main Reasons Concerning Organic Food Preferences With and Without Substantial Benefits*

Questions were asked with the aim of estimating a five point bipolar scale (endpoints: disagree strongly, agree strongly, midpoint: indecisive, neither agree nor disagree) and the levels of their agreements with five

statements. The statements are "their prices are affordable", "they are healthy", "they are of high quality", "they have certificated and secure food", "they taste delicious", "they do not contain GMO", "they do not use antibiotics for the animal production", "animals are treated well during animal production", "they ensure the protection of natural resources for posterity", "chemical and synthetic substances are not used during production", "organic product sellers have positive attitudes", "they assist the farmer who produce organic products", "the consumption of organic product goes a bomb", "it is against the monopolization".

#### *Comparing Organic Foods and Conventional Foods*

During the study, we assessed the knowledge levels of interviewees with a bipolar five point scale (see Table 2). The statements that "organic foods are healthier than the conventional ones", "they are more quality", "they are more delicious", "they are more expensive", "they have less harmful effects", "they are fashioned" have been evaluated in order to determine whether interviewees thought the statement was true or false or the they had no information.

#### *Main Reasons Concerning Organic Foods are Not Preferred*

Test subjects were evaluated to estimate a five point bipolar scale (endpoints: disagree strongly, agree strongly, midpoint: neither agree nor disagree) and the extent of their agreement with eight statements. The statements are "I would prefer more organic foods" if they (1) were cheaper, (2) if I had more income, (3) if I could easily find them in the marketplace, (4) if there were more variety of products, (5) if I could recognize their logos better, (6) if there were more information in media, (7) if I believed that they are produced organically, (8) if there were labels indicating that they do not contain GMO.

#### *Knowledge About Environmental Problems*

In this research, knowledge levels of interviewees has been investigated with five scales (endpoints: no knowledgeable about strongly, knowledgeable about strongly, neither knowledgeable nor knowledgeable). The statements were created in order to determine how much interviewees are knowledgeable about the environmental problems. The information statements about "greenhouse effect", "acid rains", "water contamination which occurs because of agricultural chemicals", "extinction of rain forests", "atomic waste", "overpopulation in the world", "sea pollution", "ozone layer depletion" were used.

Table 1. Questions

<i>Construct</i>	<i>Abreviation</i>	<i>End Point=1</i>	<i>End point=5</i>
1. What do you think about your food habits and your health?  To what extent do you agree with the following statements?	Habits and health	Not healthy at all	Very much healthy
2. What are the health and environmental reasons that are effective on your decision to buy organic foods?	Health and environmental anxiety	No health and environmental goal at all	Very strong health and environmental goal
3. To what extent do you think the following statements of conventional foods and organic foods serves a good goal?	Serves a good goal	No good goal at all	Serves to a great extent a good goal
4. How unwilling do you feel for the following statements concerning the access difficulty to organic foods?	Unwilling	No unwilling at all	Very strongly willing
5. To what extent do you think you have knowledge about the environmental outcomes of conventional food production?	Knowledgeable about the environmental outcomes	No knowledge at all about the outcomes	Very much knowledgeable about the outcomes

### 2.3. Statistical Methods and Descriptive Results

Descriptive statistics, principal component factor analysis, chi-square tests and ANOVA tests were used for the statistical analysis part of the study. We found that statistically significant variables such as educational background, gender and age differences are related to the participants' knowledge levels and attitudes towards organic foods preferences. According to the results that we obtained, younger participants, females and those with postgraduate educations are substantially have more positive attitudes about the organic foods applications than their comparison groups. However, the mean ratings for the knowledge about environmental issues involving green house effect, acid rains, water contamination, extinction of rain forests, atomic waste, overpopulation, sea pollution and ozone layer depletion are rather equal ( $p$  value  $\leq 0.05$  according ANOVA test). Besides, drinking alcohol and smoking are also not related with educational levels. On the other hand, in terms of preferences on other whole organic foods, no statistically significant educational differences were found for the constructs : "habits and health", "health and environmental anxiety", "serves a good goal" and "unwilling" on any of the organic foods preferences. In terms of gender, we found that females are significantly more positive towards the organic foods applications or preferences.

Table 2. Means and Standard Deviations (SDs) of Ratings by Educational Differences

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
I am a vegetarian	Between Groups	3,081	5	,616	,566	,726
	Within Groups	735,159	675	1,089		
	Total	738,241	680			
Eating salt-free foods	Between Groups	8,327	5	1,665	,879	,494
	Within Groups	1278,170	675	1,894		
	Total	1286,496	680			
Exercise regularly	Between Groups	21,888	5	4,378	2,196	,053
	Within Groups	1347,707	676	1,994		
	Total	1369,595	681			
I abstain from processed foods	Between Groups	5,318	5	1,064	1,094	,362
	Within Groups	656,356	675	,972		
	Total	661,674	680			
Eat fruit and vegetable	Between Groups	5,759	5	1,152	1,769	,117
	Within Groups	440,032	676	,651		
	Total	445,790	681			
Rarely eat red meat	Between Groups	25,831	5	5,166	2,478	<b>,031</b>
	Within Groups	1405,344	674	2,085		
	Total	1431,175	679			
Abstain from foods containing additives	Between Groups	4,759	5	,952	1,192	,311
	Within Groups	539,735	676	,798		
	Total	544,494	681			
Undergo medical examination regularly	Between Groups	4,517	5	,903	,434	,825
	Within Groups	1406,228	676	2,080		
	Total	1410,745	681			
Smoke	Between Groups	35,578	5	7,116	2,639	<b>,022</b>

	Within Groups	1820,020	675	2,696		
	Total	1855,598	680			
Drink alcohol	Between Groups	51,029	5	10,206	5,158	,000
	Within Groups	1335,573	675	1,979		
	Total	1386,602	680			
Prices are affordable	Between Groups	12,230	5	2,446	1,590	,161
	Within Groups	1036,776	674	1,538		
	Total	1049,006	679			
Healthy	Between Groups	2,584	5	,517	2,227	,050
	Within Groups	156,870	676	,232		
	Total	159,455	681			
Of high quality	Between Groups	1,359	5	,272	,513	,767
	Within Groups	357,253	674	,530		
	Total	358,612	679			
Certificated and secure food	Between Groups	,096	5	,019	,025	1,000
	Within Groups	531,114	675	,787		
	Total	531,210	680			
Delicious	Between Groups	6,849	5	1,370	2,182	,055
	Within Groups	423,175	674	,628		
	Total	430,024	679			
Do not contain GMO	Between Groups	3,076	5	,615	1,707	,131
	Within Groups	242,541	673	,360		
	Total	245,617	678			
Do not use antibiotics for animal production	Between Groups	4,791	5	,958	1,635	,148
	Within Groups	394,996	674	,586		
	Total	399,787	679			
Treat animals well	Between Groups	8,413	5	1,683	1,712	,130
	Within Groups	660,343	672	,983		
	Total	668,755	677			
Protection of natural resources	Between Groups	2,348	5	,470	1,199	,308
	Within Groups	264,005	674	,392		
	Total	266,353	679			
Non-use of chemical and synthetic substances	Between Groups	3,306	5	,661	1,458	,201
	Within Groups	304,242	671	,453		
	Total	307,548	676			
Seller's positiveness	Between Groups	5,951	5	1,190	1,354	,240
	Within Groups	591,469	673	,879		
	Total	597,420	678			
Supporting the farmer	Between Groups	4,011	5	,802	1,087	,366

	Within Groups	493,536	669	,738		
	Total	497,547	674			
Organic product's popularity	Between Groups	34,680	5	6,936	3,525	<b>,004</b>
	Within Groups	1320,458	671	1,968		
	Total	1355,137	676			
Against monopolization	Between Groups	2,686	5	,537	,345	,886
	Within Groups	1044,474	670	1,559		
	Total	1047,160	675			
Organic foods are healthier	Between Groups	2,188	5	,438	3,068	<b>,010</b>
	Within Groups	96,279	675	,143		
	Total	98,467	680			
More quality	Between Groups	4,788	5	,958	2,100	,064
	Within Groups	307,424	674	,456		
	Total	312,212	679			
More delicious	Between Groups	1,949	5	,390	,845	,518
	Within Groups	309,868	672	,461		
	Total	311,817	677			
More expensive	Between Groups	1,979	5	,396	,448	,815
	Within Groups	595,372	674	,883		
	Total	597,351	679			
Have less harmful effects	Between Groups	1,454	5	,291	1,181	,317
	Within Groups	165,680	673	,246		
	Total	167,134	678			
Fashioned	Between Groups	6,676	5	1,335	,730	,601
	Within Groups	1230,968	673	1,829		
	Total	1237,644	678			
Greenhouse effect	Between Groups	130,206	5	26,04 1	15,51 7	<b>,000</b>
	Within Groups	1131,169	674	1,678		
	Total	1261,375	679			
Acid rains	Between Groups	112,791	5	22,55 8	13,38 4	<b>,000</b>
	Within Groups	1137,697	675	1,685		
	Total	1250,488	680			
Water contamination	Between Groups	35,134	5	7,027	6,761	<b>,000</b>
	Within Groups	701,565	675	1,039		
	Total	736,699	680			
Extinction of rain forests	Between Groups	34,690	5	6,938	5,225	<b>,000</b>
	Within Groups	895,061	674	1,328		
	Total	929,751	679			
Atomic waste	Between Groups	40,854	5	8,171	7,057	<b>,000</b>
	Within Groups	779,226	673	1,158		

	Total	820,080	678			
Overpopulation	Between Groups	18,228	5	3,646	3,676	<b>,003</b>
	Within Groups	667,480	673	,992		
	Total	685,708	678			
Sea pollution	Between Groups	7,597	5	1,519	2,202	,053
	Within Groups	463,756	672	,690		
	Total	471,353	677			
Ozone layer depletion	Between Groups	30,911	5	6,182	6,911	<b>,000</b>
	Within Groups	601,149	672	,895		
	Total	632,060	677			

\*Statistical significance values of 0,05 or less are indicated in bold letter in Table 2

Table 3. Proportions (%) of Consumers of Fourtysix Constructs Resulting from the Consumers' Preferences of Organic Foods According to the Survey Results

	End point 1	Endpoint 3	Endpoint 5
<b>Statements (Abreviation)</b>			
<i>Habits and health</i>	<i>Not healthy at all</i>	<i>Little/rather healthy</i>	<i>Very healthy</i>
I am a vegetarian	74.2	3.8	4.4
Eating salt-free foods	11.7	16.7	36.2
Exercise regularly	16.6	18.2	25.1
I abstain from processed foods	2.8	10.4	55.6
Eat fruit and vegetable	1.3	6.2	67.4
Rarely eat red meat	18.8	16.4	23.6
I abstain from foods containing additives	2.1	5	22
I undergo medical examination regularly	15.7	19.6	28
Drink alcohol	54.1	13.6	10.9
Smoke	65.8	3.7	19.5
<i>Health and environmental anxiety</i>	<i>No health and environmental goal at all</i>		<i>Very strong health and environmental goal</i>
Prices are affordable	51.8	12.6	6.3
Healthy	3	1.6	84.9
Of high quality	0.9	7.6	74.2
Certificated and secure food	2.6	6.5	73.9
Delicious	1.3	5.7	71
Do not contain GMO	0.7	3.5	83.4

Do not use antibiotics for animal production	1.8	5.7	77.4
Treat animals well	2.9	16.1	65.7
Protection of natural resources	0.7	3.7	80.4
Non-use of chemical and synthetic substances	1.2	4.5	79.8
Seller's positiveness	1.9	12.5	60.1
Supporting the farmer	2.2	7.2	72.7
Organic product's popularity	52.5	12.9	12.2
Against monopolization	7.6	16	55.9
<i>Serves a good goal</i>	<i>No good goal at all</i>		<i>Serves to a great extent a good goal</i>
Organic foods are healthier	11.7	1.2	87
More quality	0.9	6.2	76
More delicious	0.9	3.2	78.3
More expensive	2.8	6.3	73.2
Have less harmful effects	0.4	15.8	81.8
Fashioned	59.2	12.8	9.5
Unwilling			
Cheaper price	8.9	5.1	66.7
If I had more income	11.7	11	55
Easily find them	6.6	6.6	63
More variety of product	7.5	9.4	58.1
Better organic food logos	14.1	14.1	43.4
More information in media	15.4	9.5	47.4
Produced organically	15.8	13.2	40.6
Labels indicating not GMO	10.6	7.9	56.2
<i>Knowledgeable about the environmental outcomes</i>	<i>No knowledge at all about the outcomes</i>	<i>Little knowledge</i>	<i>Very much knowledgeable about the outcomes</i>
Greenhouse effect	13	17.9	34.3
Acid rains	12	16	37.5
Water contamination	3.7	13	52.5
Extinction of rain forests	5.7	12.2	48.5
Atomic waste	4.3	11.9	52.8
Overpopulation	2.6	10.3	55.7
Sea pollution	1.9	6.7	63.3
Ozone layer depletion	3.1	7.8	60.6

When table 3 is examined in more detail, it is seen that organic food consumers have certain levels of habits and health indicators (such as eating salt-free foods 36.2 %, abstaining from processed foods 55.6 %, eating fruit and vegetable 67.4 %) and that the tendencies of unhealthy behaviour are less likely (drinking alcohol 54.1%, smoking 65.8 %).When health and environmental anxiety indicators are evaluated, the results reveal that consumers are quite careful about these indicators. On the other hand, although organic foods are more expensive than the conventional foods, most consumers prefer to purchase organic foods since these foods are more delicious, more quality and have less harmful effects (78.3%, 73.2%, 81.8%). The most important factor about the unwillingness of consumers to purchase organic foods is the higher prices of them as compared to conventional foods. In addition to them, Turkish consumers state the factors which deter them from purchasing organic foods as their low income, the difficulty of accessing them, few varieties, being non-labelled to indicate whether they contain GMO or not. Furthermore, 40% of consumers do not believe that products are produced organically. If we evaluate the knowledge levels of participants about the environmental outcomes, Table 3 indicates that most of them are well-informed with respect to environmental issues (for instance ozone layer depletion 60.6%, overpopulation 55.7%, and sea pollution 63.3 %, and so on).

Table 4. The Results of Factor Analysis In terms of Interviewees' Consumer Tendencies

	Component									
	1	2	3	4	5	6	7	8	9	10
Atomic waste	<b>,859</b>	,118	,058	,018	,059	-,003	,017	-,014	-,026	-,033
Extinction of rain forests	<b>,844</b>	,082	,008	,005	,054	,032	,025	-,038	,013	,080
Sea pollution	<b>,833</b>	-,013	,092	-,018	,069	,024	,079	,078	-,088	-,186
Ozone layer depletion	<b>,815</b>	,021	,061	-,001	,048	,011	,102	,097	-,063	-,121
Water contamination	<b>,812</b>	,077	,066	,037	,062	,012	-,105	-,037	-,012	,104
Overpopulation	<b>,804</b>	,071	,091	,018	,129	-,005	,001	,024	-,050	-,185
Acid rains	<b>,663</b>	,011	-,080	,062	,043	-,015	-,159	-,076	,181	,425
Greenhouse effect	<b>,604</b>	-,022	-,091	,079	,021	,095	-,176	,003	,204	,459
Non-use of chemicals and synthetic materials	,063	<b>,758</b>	,168	,036	,052	,044	-,023	-,022	-,033	-,077
Do not use antibiotics	,114	<b>,754</b>	,082	,085	,098	,112	-,052	-,086	-,027	,032
Do not contain GMO	,003	<b>,703</b>	,137	,275	,060	-,138	-,051	,005	-,056	-,067
Treat animals well	,045	<b>,598</b>	-,012	,153	,034	,298	,140	,011	,033	,067
More delicious	,034	-,001	<b>,772</b>	,245	,099	,061	,103	-,126	-,113	,088
More quality	,071	,093	<b>,753</b>	,281	,079	,040	,024	-,070	,017	,016
Organic foods are healthier	,159	,389	<b>,610</b>	,005	,008	,109	-,199	,081	,029	-,056
Have less harmful effects	,106	,360	<b>,529</b>	-,070	,029	,111	-,229	,106	,020	-,170
Certificated and secure food	,041	,297	,018	<b>,636</b>	,125	,049	-,067	,066	-,051	-,108
Healthy	,086	,268	,240	<b>,543</b>	,192	-,030	-,260	,063	,056	-,026
Seller's positiveness	,070	,239	-,029	<b>,428</b>	,011	,396	,087	,049	-,184	,171
Abstain from foods containing additives	,095	,105	,014	,044	<b>,742</b>	,070	-,054	,009	,013	-,054
I abstain from processed foods	,033	,143	-,028	,116	<b>,738</b>	,023	-,074	-,035	-,003	-,087
Eat fruit and vegetable	,127	-,074	,122	,137	<b>,661</b>	,101	,042	,045	-,020	-,051
Undergo medical examination regularly	,061	,053	,080	-,053	<b>,418</b>	,041	-,037	-,254	,186	-,019
Eating salt-free foods	,124	,238	,061	-,048	<b>,390</b>	-,163	,344	-,115	,027	,156

Assisting the farmer	,040	,143	,041	,062	,058	<b>,744</b>	-,012	-,025	,006	-,085
Against monopolization	-,028	-,024	,197	-,016	,057	<b>,646</b>	,087	,006	,179	-,078
Protection of natural resources	,073	,466	,014	,084	,160	<b>,504</b>	-,029	-,046	-,095	,078
Fashioned	-,002	-,040	-,045	-,084	-,047	-,089	<b>,762</b>	,086	,056	,022
Organic product's popularity	-,035	-,034	-,017	,015	-,023	,236	<b>,730</b>	-,029	,015	-,077
Drink alcohol	,107	,006	-,036	-,052	-,079	-,056	,018	<b>,803</b>	,096	,168
Smoke	-,036	-,062	-,033	,084	-,039	,034	,005	<b>,789</b>	-,126	-,043
More expensive	,038	,070	,136	-,078	,110	,101	-,003	,050	<b>-,585</b>	,287
I am a vegetarian	-,038	-,035	,017	-,001	,055	,068	-,031	,033	<b>,567</b>	,141
Exercise regularly	,032	,005	,108	-,163	,268	,084	,075	-,052	<b>,527</b>	,101
Prices are affordable	,023	,003	-,104	,339	-,124	,044	,304	-,071	<b>,478</b>	-,254
Rarely eat red meat	,107	,046	-,031	,009	,192	,113	-,024	-,116	,042	<b>-,580</b>

\*Values of 0,30 or more are indicated in bold in table 4 according to Keiser-Meyer-Olkin measure.

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

A Rotation converged in 16 iterations.

Table 4 indicates the results of the principal component factor analysis. We try to investigate which participant tendencies about consuming organic foods are affected by which factors. Kaiser-Meyer-Olkin measure of sampling adequacy and significant levels are 0.841, 0.00 respectively. This measure shows that factor analysis can be used terrifically. 38 statements that have an influence on consumer preferences are combined in 10 dimensions. In the first dimension, statements are atomic waste, extinction of rain forests, sea pollution, ozone layer depletion, water contamination, overpopulation, acid rains, greenhouse effect (factor loadings are ,859, ,844, ,833, ,815, ,812, ,804, ,663 and ,604 respectively). This factor can be called as "*environmental reasons*". The other one factor is composed of statements such as "non-use of chemicals and synthetic material", "do not use antibiotics for the animal production", "do not contain GMO", "treat animals well" (factor loadings are ,758, ,754, ,703 and ,598 respectively). This factor can be called as "*the desire of conservation of nature*". Third factor is composed of statements such as "more delicious", "more quality", "organic foods are healthier", "they have less harmful effects". This factor can be called as "*healthy sensibility*". The other factor consists of "certificated and secure food", "healthy", "seller's positiveness" (factor loadings are ,636, ,543, and ,428 respectively). This factor can be called as "*tendency of being healthy and secure*". Fourth factor comprises of statements such as "abstain from foods containing additives", "I abstain from processed foods", "eat fruit and vegetable", "undergo medical examination regularly", "eating salt-free foods" (their factor loadings are ,742, ,738, ,661, ,418, and ,390). This factor can be called as "*the desire of staying healthy*". Fifth factor consists of "assisting the farmer against monopolization", "protection of natural resources" (factor loadings are ,744, ,646, and ,504 respectively). Fifth factor can be called as "*environmental factors*". Sixth factor is constituted from "fashioned", "organic product's popularity" (factor loadings are ,762, ,730). This factor can be called as "*popularity*". Statements such as "drink alcohol" and "smoke" generate seventh factor (factor loadings are ,803 and ,789). This factor can be called as "*harmful habits*". Eighth factor is constituted of "more expensive", "I am a vegetarian", "exercise regularly", "prices are affordable" (factor loadings are ,585, ,567, ,527 and ,478). This factor can be called as "*income effect*". The last factor is "rarely eat red meat" (factor loading is -,580). This last factor can be called as "*food habits effect*".

According to the results of factor analysis in terms of interviewees' consumer tendencies, health reasons such as the desire of staying healthy, and environmental reasons aimed to the protect the environment are the most important reasons of participants' interest toward the organic foods as compared to conventional foods. Strikingly, our results reveal that there is not a significant relationship between the education level and the desire of staying healthy. Among the participants, health reasons is the most important factor on the purchase of organic foods irrespective of educational levels. Additionally, number of people who drink alcohol and smoke is

also unrelated to the educational level. Although participants are aware of the side effects of these habits, they continue drinking alcohol and smoking in all educational levels. Another interesting outcome of this factor analysis is that as the educational level increases participants are more concerned about the environmental reasons and the protection of environment. Finally, participants are not very much interested in sensory motives such as taste, flavour, visual features and quality while purchasing organic foods.

### 3. Discussion and Conclusion

Our study demonstrates the negative attitudes of people towards the use of GMO within the field of conventional food production. However, a small group of consumers exists who have more positive attitudes towards the products containing GMO. A majority of participants declared that it would be against their life principles and be morally wrong for them to consume foods that contain GMO.

Our finding that consumers are generally rather negative towards the use of GMO for food production is in line with the major literature and other consumer surveys (Magnusson and Hursti, 2002; Frewer et al., 1997; Gaskell et al., 1998). However, not all consumers in the present study have negative perceptions about the GMO. Males, who have the education levels below the high-school graduates demonstrated more positive approach towards foods which contain GMO than women. This result is in accordance with previous studies (Hill et al., 1998; Hoban & Kendall, 1993; Magnusson & Hursti, 2002; Sparks et al., 1994). Furthermore, participants with primary school educations have the most positive attitudes towards the GMO applications and environmental problems in comparison with other educational groups. This finding is in line with other researches (Gaskell et al., 1998; Hoban & Kendall, 1993) which indicate that people with higher education have more positive perceptions of organic food consumption. In this study, most consumers appear to have enough knowledge about the GMO, other environmental issues and chemicals and synthetics which damage nature. The present study also found that consumers of organic foods or supporters of organic food production are significantly more likely to be younger (Gaskell et al., 1998). Most consumers in our study do not perceive "more delicious" and "lower price" as sufficiently good factors for purchasing conventional foods. A substantial group of consumers in this study expressed that they would rather buy conventional foods if they were "healthier" or "better for nature".

In general, the results demonstrate that although the majority of the Turkish consumers have rather negative approaches towards the GMO applications and are concerned with environmental issues, some consumers have more positive attitudes depending on their education levels. The most important factors that influence Turkish consumers' decision-making for the consumption of healthy nutrition are security, concerns about the future of nature, environmental ethics and protection of health. Food safety, which is perceived as non-use of chemicals and synthetics, is the foremost concern for Turkish organic food consumers in their final consumption decisions. Attainableness to organic products has been stated as an important factor on the decision of consumers to purchase organic food in Turkey. Along with increasing disposable personal income, Turkish consumers try to choose a healthier life for themselves and for their children, and for the environment. They are more likely to pay higher prices to ensure that food products are safe in order to provide a healthy life style to their families. There are many researches in different countries which obtain similar results on consumers' preferences and their motives (Santos, 2012; Lee et al., 2014; Xu et al., 2012; Stolz et al., 2009; Schleenbecker, R., and Hamm, U., 2013; Falguera et al., 2012; Kearney, 2010; Hughner et al., 2007; Aertsens et al., 2009; Akgungor et al., 2010; Bayah & Juhdi, 2010; Bruschi et al., 2015; Hoppe et al., 2013; Ilyasoglu et al., 2010; Kuhar & Juvancic, 2010; Lima-Filho et al., 2012; Mehmetoglu & Demirkol, 2007; Pugliese et al., 2013; and Zanoli et al., 2012).

Our study contributes to further evaluation of consumers' preferences and perceptions of organic foods and conventional foods since we interviewed with a wide variety of people from different educational backgrounds. We identified several factors that reflect the various rationales used by consumers when deciding to buy organic food. However, we agree that more research is needed in this field, especially about the attitudes of consumers on the purchase of organic foods in developing countries. This will also provide the researchers the opportunity to analyze different factors on the decision making processes of different consumers. As a suggestion for further research different kinds of interview methods can be employed in future researches as they can give rise to more knowledge related to GMO, conventional foods and organic foods.

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