



Investigation of Consumers' Trends Concerning Honey Supply. A Case Study in Central Greece

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Abstract

Honey is an important element of human diet and since ancient times is considered an essential source of food. The aim of the study is to identify the factors that: 1) affect consumer behavior towards honey, 2) are related to the honey purchase from the supplier, and 3) can predict the intention to buy honey directly from the producer including those in street markets. The research objectives were achieved by investigating a representative sample of subjects from the region Attica, Central Greece. A quantitative primary survey was carried out with 138 honey consumers as participants. Among the conclusions derived from the statistical treatment of the collected data are the facts that women and people with a higher educational level prefer buying honey directly from the producer in street markets as well as participants with high monthly income and high educational level, consume high quantities of honey.

Keywords: Consumer Behavior; Honey Certification; Honey market; Honey Origin; Honey Quality

Introduction

Honey is a natural substance produced by honeybees, with properties that meet many different consumer needs for food and medical purposes since the ancient times. The nutritional composition of honey includes carbohydrates (mainly glucose and fructose), proteins, minerals, amino acids, trace elements, vitamins and polyphenols [1, 2].

However, honey does not belong to the group of foods consumed daily, as it is considered a relatively high priced product. Over the last decades, consumer trust in food quality and safety has been shaken up, both due to the various food scandals that have occurred and the globalization of supply chain food. Certifications of food and raw materials ensure further promotion of an agricultural or livestock or processed product to the consumer, offering a sense of safety. However, these certifications are not applicable to small food chains - from producer to consumer, which are increasingly gaining ground throughout Europe [3].

Small food chains contact producers with consumers through direct interactions. The immediacy of these interactions, on the one hand, is capable of providing a sense of trust between the consumer and the producer and, on the other hand, redefines the perceived quality of the consumer in his purchasing decisions [4]. It is therefore obvious that the re-establishment of the small food chains is an option for both consumers and producers, which opposes the prevailing conventional world markets characterized by standardized production, anonymously industrialized food, long food transport distances and unequal distribution of power along the supply chain, which is increasingly dominated by retailers [5].

A critical question arises from the above-described status, which is why consumers eventually choose to purchase food from street markets? According to the bibliographic review with respect to this question the following parameters are of major importance [6-10]:

- The need for high-quality fresh food directly from the source.
- The interaction. Consumer is able to interact with the producer and express his needs, values and concerns. A relationship of trust is built through this interaction. At the same time, purchasing food in street markets is a more enjoyable process for consumers, less mechanical, sterile and impersonal, since they can interact with other consumers and exchange information.
- The feeling of giving their money to something worthwhile (value for money).
- The protection of personal health and the environment.
- The financial support to small producers.
- The strengthening of national products.

In the context of small food chains, as in the context of conventional markets, both the intention and the final consumer behavior are influenced by factors and incentives, which are differentiated per food product. Among the factors that influence the behavior of consumers relating to the purchase and consumption (quantity, frequency) of honey are:

- **The organoleptic characteristics of Honey:** such as its taste, color, aroma and texture. These characteristics reflect the perceived quality of consumer and are directly related to its sales price [11-14].
- **The Price of Honey:** The price of honey has been identified as an important factor associated with its purchase in many surveys [15]. Romanian consumers consider honey to be an expensive but not a luxurious food product [16].
- **The Perceived Nutritional Value of Honey:** In general, honey consumption has been associated with its beneficial effect on human health, in many cultures [17-19]. There are many surveys that mention the positive relationship between honey consumption and its high nutritional value for human health [20, 21].
- **The Crystallization of Honey:** Several consumers believe that the crystallization of honey indicates an artificial product (a product of deception) [22]. Crystallization of honey is one of its most well-known physical properties, which theoretically characterizes all honey [23]. Other research studies have shown that the phenomenon of crystallization is an inhibiting factor in its consumption [24, 25].
- **Socio-Demographic Characteristics:** The demographic and socio-economic characteristics of consumers related to the purchase consumption of honey are: **i) Gender.** Women consume more honey [26]. Similar results have been also obtained in other studies [14, 23]. **ii) Educational level:** Higher consumption of honey is seen in higher educated people [20, 26], as they perceive to a greater degree its benefits to human health. At the same time, people with a higher educational level prefer to buy honey directly from the producer and focus more on price, while for people up to secondary education, inhibiting factor is the crystallization of honey [27]. **iii) Occupation:** Employees show higher levels of honey consumption [16, 27]. **iv) Age:** Higher levels of honey consumption occur in older people [16]. **v) Residential area.** Higher levels of honey consumption occur in people living in semi-rural and rural areas. Urban residents seek to purchase honey directly from the producer, while for rural residents an important criterion for buying honey directly from the producer is the low price [27]. **vi) Income:** People with higher incomes consume more honey, as it is more affordable for them to adopt a healthier lifestyle [16, 28]. **vii) Number of people in households.** As the number of family members increases, consumption levels of honey also increase [16], mainly due to its beneficial properties in human health [20]. In addition, other study has shown that people who do not consume honey but buy it for a family member make the choice based on its price and nutritional value [27].

Honey purchasing behavior in Western Australia has been studied and showed that consumers consider standardized honey sold to supermarkets of inferior quality compared to honey sold in street markets, directly from the producer [15]. According to [16], consumers of the North-West region of Romania prefer to buy honey from a local producer as they have more confidence in domestic honey than in imported one. Consumers' preference to local producers stems from the confidence and security they feel towards them, related to better quality, geographical origin and locality [16, 20, 25, 29]. According to [24], consumers' criteria for buying honey from a local producer are the size of his production and the location of his hives, which affect the quality of the product. According to the above researchers, consumers preferred local producers, whose hives are on a mountain and who do not make intensive production. It has been shown that the price and origin of honey were the main factors influencing consumers in Prague, with the ideal honey for them is the one coming from a local producer who has his honeybees in forest and sells it at a lower price than the standard ones [27].

The purchase of honey, directly from the producer, is an important element in building consumer confidence with regard to its quality [25]. This is due to the fact that the consumer's purchasing decision is directly affected by the connection of the honey product to its place of production. This connection, which establishes a solid foundation of trust with the producer, is due to the consumer's ability to interact directly with the producer and collect the necessary information. This information is usually about the honey nutrients, the way and date of production, the location of the hives and whether it is crystallizing or not. The perceived quality of the buyer is subjective and depends on many factors, most notably the relationship between the amount of money he intends to give and the quality of the product. The issue of non-certification and the absence of a label on honey is not an inhibiting factor for the consumers who purchase directly from the producer, as a personal relationship and a sense of trust have been developed between the buyer and the producer [23]. On the contrary consumers that buy honey only from supermarkets place great emphasis on the issue of certification and labeling, declaring their willingness to pay more money for the purchase of honey directly from a producer providing a quality guarantee. Moreover this category of buyers is quite willing to participate in beekeeping exhibitions, which will be able to test the honey. The most favorable incentives for buying honey directly from the producer would be certification and labeling, lower prices, point-of-sale testing, telephone ordering and delivery at home as well as advertising of the product either at the place of sale or through special brochures [23].

In the present study, the main factors affecting the intention of honey consumers in relation to the origin of the supplier and their behavior as consumers were detected. Certain perceptions associated with honey consumption among consumers in Attica, Central Greece, were identified as well as purchasing and consumption trends (i.e. place and frequency of purchase, quantity and frequency of consumption, consumer profile).

Material and Methods

The current study was based on primary data collected from 138 honey consumers, using questionnaires. Data collection was carried out in the region of Athens (Central Greece) during the first trimester of 2019. In the surveys, questions were included concerning: i) demographic characteristics (gender, age, monthly income, education level, primary occupation, area of living and number of people in households), ii) consumption of honey (frequency of honey purchase, quantity of honey consumption), iii) general views, trends, perceptions of honey and iv) reasons of choosing a particular honey supplier (local producer or supermarkets). The questions related to views, general opinions about honey and reasons of choosing a particular honey supplier were rated with 5-point scale response format (from 1= strongly disagree to 5=strongly agree). Descriptive analysis, chi-square independent test, cross-tabulation tables and alinear multiple regression were performed using SPSS statistical software (version 16).

Descriptive Analysis

The frequencies were measured and the percentages of the responses were calculated in case of the closed-ended questions. For the questions with scale response format (from 1= strongly disagree to 5=strongly agree), the Mean Value (MV) and Standard Deviation (SD) were calculated.

Variable Independence Testing

The Crosstabs procedure was used to test the independence between two variables. The Crosstabs process creates double-entry tables between two qualitative variables by constructing a common frequency distribution (correlation table) that allows the calculation of the respective percentages. Through these percentages the correlation between the two variables can be presented. The independence test takes place through the Statistical Control X^2 (Chi – Square), which detects the differences in the distribution of the values of one variable to the values of the other, taking into account the distances between the observed frequencies and the expected ones. X^2 test doesn't provide information on the intensity and the cause of the relationship between the two variables (if there is one). The certainty of the dependency of the two variables increases as X^2 gets bigger.

Two hypothesis are introduced:

H0: the null hypothesis that the two variables are independent.

H1: the alternative hypothesis, the two variables are dependent. If the statistical significance is Sig <0.05 then the hypothesis H0 is rejected. If Sig.>0.05, the independence hypothesis cannot be rejected.

Multiple Regression Analysis

Multiple regression analysis tests if the independent variables could predict the dependent one and are equations of the form:

$$A = \alpha_0 + \alpha_1 K_1 + \dots + \alpha_i K_i \quad (\text{Eq. 1})$$

Where A is the dependent variable and K_1 to K_i are the independent ones. The intercept (α_0) and the regression coefficients of the independent variables (α_i) are determined by multiple regression analysis. R Square values greater than 0.10 indicate that fluctuations in the values of the dependent variable explain more than 10% of the fluctuations in the values of the independent variables. In this way it can be safely verified that the variables are linked to a causal / predictive relationship. The Beta factor explains the change in the dependent variable if the independent variable is changed. Its statistical significance is checked by Significance value, which must be less than 0.05. The Student's t-test values are also used to characterize the relative importance of the independent variables in particular. Table 1 presents the independent variables as well as the dependent variable, based on which the predictive model was formulated.

Dependent Variable	Independent Variables
Choice of a particular honey supplier (producer or supermarkets)	organoleptic characteristics
	price
	crystallization
	certification
	origin
	perceived quality
	nutritional value

Table 1: The independent variables as well as the dependent variable of the survey.

Results

The demographic characteristics of each group of consumers are presented in (Table 2). The statistical treatment of the collected data revealed useful outcomes as presented below.

		Group A Freque y	Group B Freque y	Group C Frequency	Total Freque y	Percentage Frequency, %
Gender	Male	20	20	16	56	40,58
	Female	13	42	27	82	59,42
Age (years)	18-25	3	2	3	8	5,80
	26-35	7	13	14	34	24,64
	36-45	16	25	9	50	36,23
	46-55	4	8	8	20	14,49
	56 and more	3	14	9	26	18,84
Monthly income (€)	≤ 600	4	11	7	22	15,94
	650 €-1000	14	23	21	58	42,03
	1100 €-1500	10	16	12	38	27,54
	≥1600	5	12	3	20	14,49
Education Level	Secondary	8	17	12	37	26,81
	Vocation school	7	9	6	22	15,94
	University	11	27	16	54	39,13
	M.Sc., M.B.A., PhD	7	9	9	25	18,12
Primary Occupation	Self-employed	5	9	7	21	15,22
	Private sector	18	24	19	61	44,20
	Public sector	5	11	7	23	16,67
	Student	1	2	2	5	3,62
	Unemployed	1	8	1	10	7,25
	Retired	3	8	7	18	13,04
Area of living	Urban	22	36	27	85	61,59
	Suburban	4	12	3	19	13,77
	Rural	2	10	5	17	12,32
	Mountainous	1	1	1	3	2,17
	Islanding	4	3	7	14	10,14
Number of	1	5	12	11	28	20,29
	2	5	15	4	24	17,39

people in households	3	7	11	12	30	21,74
	4	12	21	12	45	32,61
	5	4	2	4	10	7,25
	6	0	1	0	1	0,72

Table 2: Demographics of the survey participants according to their preference of honey purchasing.

Preference of Honey Supplier & The Socioeconomic Profile of Honey Consumers: Out of 138 participants, 33 (29.91%) buy honey only from supermarkets / organic shops (Group A), 62 (44.93%) prefer to purchase honey only directly from the producer (Group B) and 43 participants (31.16%) both directly from the producer and supermarket (Group C). It is noted that the vast majority of respondents prefer purchase honey directly from a producer.

Correlation between Demographics and Honey Supplier Choice: The choice of honey supplier depends on gender ($X^2 = 7,214$ & Sig. = 0,007) and on the educational level ($X^2 = 7,129$ & Sig. = 0,009). Specifically, 65.7% and 67.6% of the subjects who purchased honey directly from the producer and from shops, are women and people of higher educational level (university, M.Sc., M.B.A., PhD), respectively. Additionally, 60.6% and 75.8% of the subjects who supplied honey only from stores, are men and people of lower educational level (secondary, vocational), respectively.

Honey Consumption Behavior of the Sample: 70.29% of the subjects (97 participants) show low consumption of honey (frequency of honey purchase, quantity of honey consumption), while the remaining 29.71% (41 participants) shows high consumption.

Correlation between Honey Consumption Behavior and Selection of the Honey Supplier: Chi-square test and cross-tabulation tables show that honey consumption and choice of honey supplier are dependent ($X^2 = 4.402$ & Sig. = 0.036). In particular, it emerged that 84.8% of the low-consumption honey sample chooses its supply only from stores and that 34.3% of the high-consuming sample selects its supply directly from the producer.

Correlation between Honey Consumption Behavior and Demographics: The consumption of honey is related to the monthly income of the participants ($X^2 = 6.216$ & Sig. = 0.022) and to their educational level ($X^2 = 7.966$ & Sig. = 0.004). Specifically, 63.4% of the high-consumption honey subjects has a high monthly income and 67% of the low-income subjects shows lower honey consumption levels. Additionally, 90.2% of the high consumption honey subjects have a high educational level and 56.7% of the subjects with a low educational level show lower consumption levels of honey.

Factors Affecting Honey Supplier Preference

Organoleptic Characteristics of Honey

(Table 3) shows the MV and the SD for the organoleptic characteristics of honey (flavor, aroma, texture, color), as they result from participants ratings, per group. It is noted that for all three groups, the organoleptic characteristics of honey are an important factor in choosing its supplier ($MV > 4$), with Group B consumers giving a slight increased importance to these characteristics.

Organoleptic characteristics	Group A		Group B		Group C	
	MV	SD	MV	SD	MV	SD
Flavor	4.21	0.96	4.69	0.56	4.49	0.77
Aroma	4	0.97	4.27	0.87	4.16	1
Texture	3.97	1.02	4.23	0.93	4.02	1.06
Color	3.88	1.05	3.87	1.14	3.7	1.12

Table 3: The mean value (MV) and the standard deviation (SD) of the sample responses per group of consumers with regard to the organoleptic characteristics of the honey they purchase.

Price of Honey

With respect to the price of honey, the MV of the 3 consumer groups is close to 3 (the neutral scale rating from 1 to 5), suggesting that the selling price of honey is neither an inhibitor nor an encouraging factor of buying honey (Table 4). However, it is worth mentioning that Group C consumers, who buy honey both from the shops and directly from the producer, rated little more the factor of the its price.

Price of honey	Group A		Group B		Group C	
	MV	SD	MV	SD	MV	SD
Honey is affordable	3.12	1.32	3.32	1.21	3.67	1.15
Honey is an expensive food product	2.97	1.33	2.81	1.08	2.86	1.26
Honey is a luxury food product	2.64	1.34	2.29	1.27	2.67	1.30

Table 4: The mean value (MV) and standard deviation (SD) of the sample responses by group of consumers in relation to the price of honey.

The Crystallization of Honey

Consumers who purchase their honey directly from its producer (Group B) seem to know to a greater degree that the crystallization of honey is one of its most known physical properties, which, theoretically, characterizes all honey, and consequently, it is not a sign of an artificial product (MV = 1.68) (Table 5). However, this property of honey appears to be a factor affecting moderately the consumers of groups B and C (MV = 3.53 and MV = 3.67, respectively) and highly the consumers of Group A (MV = 4.00) (Table 5).

The crystallization of honey	Group A		Group B		Group C	
	MV	SD	MV	SD	MV	SD
I prefer honey that doesn't crystallize	4	0.9	3.53	1.38	3.67	1.32
The crystallization is a sign that the honey is an artificial product	2.39	1.34	1.68	0.95	2.14	1.37

Table 5: The mean value (MV) and the standard deviation (SD) of the sample responses, by group of consumers, regarding the phenomenon of crystallization of honey.

Certification (Authentication) / Origin

Consumers of groups B and C are more likely to trust honey of Greek origin (MV = 4.47 and MV = 4.00, respectively), compared to Group A consumers (MV = 3.48) (Table 6). Perhaps, that's the reason why participants of Group B and C purchase their honey directly from a Greek producer. On the other hand, consumers of Group A (MV = 4.18) emphasize on certification of the honey compared to consumers of groups B and C (MV = 3.52 and MV = 3.63, respectively) (Table 6). Probably, consumers of Group A prefer to purchase their honey only from shops and supermarkets, since the certification of honey directly from the producer is often absent.

Certification / Origin	Group A		Group B		Group C	
	MV	SD	MV	SD	MV	SD
I prefer a honey of Greek origin	4.06	0.93	4.71	0.80	4.63	0.58
I prefer a honey with a certification label	4.18	0.92	3.52	1.32	3.63	1.45
I trust only honey of Greek origin	3.48	1.3	4.47	1.02	4.00	1.21

Table 6: The mean value (MV) and standard deviation (SD) of the sample responses by group of consumers in relation to the certification / origin of the honey.

Perceived Quality

With regard to the dimension of perceived quality, we could locate significant similarities and significant differences between the three groups of consumers. Starting with the similarities, all three groups of honey consumers mention that the reason for choosing particular standard honey brand or a particular producer is the fact that the particular honey they purchase falls within the quality criteria they have set (MV > 4.00 for all groups) (Table 7). Furthermore, the three consumer groups agree that not all types of honey have the same quality, thus supporting any of their choice. With regard to the differences, the views that "honey sold in supermarkets is inferior to the honey of the producer" and "honey sold to supermarkets is industrial" are noticeable and find a greater degree of consistency in consumers of groups B and C and much less in consumers of group A (Table 7). The above results are reasonable and expected as the perceived quality criteria of each group are different and therefore the different choice of honey supplier. Group A

consumers consider that their choice is based on quality criteria, which are rejected by consumers of Groups B and C, as they have a different choice of honey supplier.

Perceived Quality	Group A		Group B		Group C	
	MV	SD	MV	SD	MV	SD
I purchase a high quality honey	4.21	0.82	4.76	0.50	4.67	0.64
All kinds of honey have the same quality	1.36	0.65	1.31	0.74	1.30	0.80
Honey sold in supermarkets is inferior to the honey of the producer	2.15	1.2	3.81	1.32	3.35	1.15
Honey sold to supermarkets is industrial	2.07	1.21	3.5	1.22	3.33	1.21

Table 7: The mean value (MV) and standard deviation (SD) of the sample responses, per consumer group, with respect to the perceived quality of the honey they purchase.

The Perceived Nutritional Value of Honey

Regarding the dimension of the perceived nutritional value of honey, there are no differences in the views and behaviors of the 3 consumer groups, as shown in (Table 8).

The perceived nutritional value of honey	Group A		Group B		Group C	
	MV	SD	MV	SD	MV	SD
Honey offers many benefits to human health	4.55	0.87	4.81	0.44	4.79	0.41
Honey suits my healthy diet	3.79	1.39	4.24	1.00	4.19	1.03
I consume honey mainly when I'm sick	1.94	1.22	1.68	1.14	2.05	1.19
Honey consumption causes weight gain	2.33	1.05	2.05	1.17	1.95	1.15
Honey is a substitute for sugar	3.06	1.46	3.15	1.48	3.07	1.3
Most people do not know the benefits of honey for human health	3.33	1.19	3.58	1.02	3.44	1.3

Table 8: The mean value (MV) and the standard deviation (SD) of the sample responses by group of consumers with respect to the perceived nutritional value of the honey.

Factors That Predict Consumers' Preference of Honey Supplier

The reasons for which Group A consumers purchase honey only from supermarkets or organic shops and not directly from the producer are the selling price (MV =3.09) and the non-certification of the product (MV=3.45). These results are also verified by their responses to the reasons why they purchase honey directly from its producer. According to their responses, Group A consumers buy honey directly from its producer: 1) if its price was lower than that at the supermarkets or stores (MV = 3.73), 2) if it is certified but more expensive (MV=3.67), 3) if they are able to taste it before they buy it(MV = 3.48) and 4) if the place of sale is close to their home or if it possible to deliver it at home (MV = 4.12). In addition, it is worth mentioning that the purchasing behavior of consumers of Group A is not the result of a comparison between supermarkets and producers, i.e. they discard the honey purchasing directly from the producer for other reasons and not because they were not satisfied (MV = 1.24). Group A consumers are also characterized by low levels of intention to test honey from beekeeping producers (MV=2.48).

With regard to Consumers of Groups B and C, the following elements emerged:

- Both consumer groups trust the honey directly from its producer due to its high level of quality (MV=4.58 for Group B and MV=4.26 for Group C).
- The satisfaction of the special preferences offered by producer's honey is an important factor of their preference, for both consumer groups (MV=4.60 for Group B and MV=4.19 for Group C).
- Non-certification is not an inhibiting factor, for both consumer groups considered, as they trust the producer of their choice (MV=4.40 for Group B and MV=4.00 for the Group C). In particular, Group B consumers have gathered from the producer all the necessary information on the production of purchased honey, to a greater extent compared to Group C consumers (MV=3.84 for Group B and MV=3.16 for Group C).
- Consumers of Group B have a higher level of commitment to producer of their choice compared to Group C consumers, as they are more likely to purchase honey directly from the producer even if he is away from their home (MV=4.42 for Group B and MV=3.42 for Group C).

- Both consumer groups would purchase honey from a producer that is suggested by a friend / relative (MV=4.15 for Group B and MV=4.30 for Group C).

In order to determine which factors (organoleptic characteristics, price, crystallization, certification, origin, perceived quality and nutritional value - independent variables, (Table 1) can predict the choice of honey supplier (dependent variable), a linear multiple regression analysis was performed. The results are shown in (Table 9). Price and certification are the factors that can predict the behavior of Group A consumers, while the behavior of Group B and C consumers can be predicted by organoleptic characteristics, origin and perceived quality.

	Independent variable	R square	Beta (b factor)	t-test values	Sig. (Significance)	Coefficients of the model
Group A	Price	0.405	0.255	1.472	0.033	0.148 (α1)
	Certification		0.448	2.747	0.011	0.286(α2) 1.409 (α0)
Group B	Organoleptic characteristics	0.384	0.29	2.591	0.012	0.285 (α1)
	Origin		0.327	2.124	0.011	0.311(α2)
	Perceived quality		0.441	3.375	0.001	0.357(α3) 1.256 (α0)
Group C	Organoleptic characteristics	0.529	0.361	2.968	0.005	0.284 (α1)
	Origin		0.306	2.057	0.019	0.298(α2)
	Perceived quality		0.388	3.161	0.003	0.283(α3) 3.534(α0)

Table 9: Results of the linear multiple regression analysis for the prediction of the choice of honey supplier (dependent variable) for each of the Groups A, B and C.

Discussion

In the present study, a research was conducted on a relatively small but representative sample (in terms of demographic characteristics) in the region of Attica, Central Greece. High consumption of honey was related to participants with a high monthly income and a high educational level. It is speculated that higher-educated people are more aware of the nutritional value of honey to human health and that people with higher monthly incomes can afford the adoption of a healthier diet. The consumption trend of the participants, related to the supply of honey, is more favorable to its selection directly from the producer. It can be noticed that in the Greek consumer market, as well as across Europe, small food chains - from producer to consumer - are gaining more and more ground. The results of the study showed dependence between honey consumption and honey supplier selection. In particular, purchasing honey directly and exclusively from the producer is more favorable to high consumption honey buyers, as opposed to those with low consumption who prefer purchase honey only from supermarkets and organic shops. The purchase of honey directly from the producer is preferred by women and people with a higher education level. With regard to gender, women prefer to buy honey directly from the producer, as they are the ones which are mainly responsible for the family's nutritional needs and therefore consider that their choice is related to a product of better quality. Participants with a higher educational level prefer to buy honey directly from the producer as they link their choice to better quality and origin.

The participants of this survey was divided into 3 groups, depending on their honey supplier: Group A: Only from supermarkets / organic shops, Group B: Directly from the producer and Group C: Directly from the producer and from supermarkets. For all three consumer groups, the dimension of the perceived nutritional value of honey is an important factor in choosing a supplier, with no differences in their views. Although the subjects do not correlate crystallization as a sign of an artificial product, nevertheless, this honey property appears to affect the choice of the supplier; in a moderate grade for the consumers of Groups B and C and in a higher one for the consumers of Group A. The price and the issue of certification of the honey product are significant factors for consumers of Group A, whereas for consumers of Groups B and C, the Greek origin of honey is a minor factor. Moreover, for the consumers of Groups B and C, there is a direct link between the supplier choice and the organoleptic characteristics of honey; a fact that basically reflects their preferences. All three consumer groups base their choice on the dimension of quality. However, the dimension of perceived quality is subjective as each consumer has its own quality criteria; the consumers of Group A quality criteria are not in line with the Consumers of Groups B and C and vice versa. In general, the views of the participants on whether the honey sold in supermarkets is inferior to the honey of the producer differ significantly and are based on the supplier's choice.

Conclusions

The results of the present study, in relation to the factors that influence the choice of honey supplier, are in agreement with the results of other surveys with a similar purpose. Factors affecting consumers who buy honey only from supermarkets or organic stores are the lower sales price and the certification, whereas for consumers who buy honey directly from the producer, the main factors are perceived quality, Greek origin and organoleptic characteristics. Future perspectives are the increase of the number of participants and the extension of the research to further areas of Greece, in order to detect trends in honey consumption and purchase in the modern society of this country that are in agreement or not with the results of the present and other studies. Some other factors of possible consideration such as further certification as well as honey products' promotion and management trends could be possibly included in future studies.

Conflicts Of Interest

The authors declare no conflict of interest.

References

1. Alvarez-Suarez JM, Tulipani S, Romandini, S, Bertoli E, Battino M (2010) Contribution of honey in nutrition and human health: a review. *Medit. J. Nutr. Metab* 3: 15-23.
2. Crittenden AN (2011) The importance of honey consumption in human evolution. *Food and Food ways* 19: 257-273.
3. Kneafsey M, Venn L, Schmutz U, Balázs B, Eyden-Wood T, et al. (2013) Short food supply chains and local food systems in the EU. A state of play of their socio-economic characteristics. JRC Scientific and Policy Reports. Joint Research Centre Institute for Prospective Technological Studies, European Commission.
4. Migliore G, Schifani G, Cembalo L (2015) Opening the black box of food quality in the short supply chain: Effects of conventions of quality on consumer choice. *Food Quality and Preference* 39: 141-146.
5. Galli F, Brunori G (2013) Short Food Supply Chains as drivers of sustainable development. Evidence Document. Document developed in the framework of the FP7 project FOODLINKS (GA No. 265287).
6. Connell DJ, Smithers J, Joseph A (2008) Farmers' markets and the 'good food' value chain: a preliminary study. *Local Environment* 13: 169-185.
7. Feagan RB, Morris D (2009) Consumer quest for embeddedness: a case study of the Brantford Farmers' Market'. *Inter. J. Consum. Studies* 33: 235-243.
8. Zepeda L, Deal D (2009) Organic and local food consumer behaviour: alphabet theory. *Intern. J. Consumer Studies* 33: 697-705.
9. Carey L, Bell P, Duff A, Sheridan M, Shields M (2011) Farmers' Market consumers: a Scottish perspective. *Intern. J. Consumer studies* 35: 300-306.
10. Giampietri E, Verneau F, Giudice T, Carfora V, Finco A (2018) A Theory of Planned behaviour perspective for investigating the role of trust in consumer purchasing decision related to short food supply chains. *Food Quality and Preference* 64: 160-166.
11. Árváné VG, Csapó Z, Kárpáti L (2011) Evaluation of consumers' honey purchase habits in Hungary. *Journal of Food Products Marketing* 17: 227-240.
12. Mohamadi-Nejad AM, Lotfi A, Radfar R (2013) Estimating the qualitative pricing model of honey in Iran. *J. Basic Applied Scient. Research* 3: 483-487.
13. Yeow SHC., Chin STS, Yeow JA, Tan KS (2013) Consumer Purchase intentions and honey related products. *J. Marketing Research Case Studies* 2:1-15.
14. Bršćić K, ŠugarT, Poljuha D (2017) An empirical examination of consumer preferences for honey in Croatia. *Applied Economics* 49: 5877-5889.
15. Batt PJ, Liu A (2012) Consumer behaviour towards honey products in Western Australia. *British Food J.* 114: 285-297.
16. Pocol CB, Bolboaca DS (2013) Perceptions and trends related to the consumption of honey: A case study of North-West Romania. *Intern. J. Consumer Studies* 37: 642-649.
17. Zamudio F, Kujawska M, Hilgert NI (2010) Honey as medicinal and food resource. Comparison between Polish and multiethnic settlements of the Atlantic Forest, Misiones, Argentina. *The Open Complementary Medicine Journal* 2: 58-73.
18. Bogdanov (2012) Short history of honey in medicine. *Bee Product Science*. <http://www.bee-hexagon.net/files/fileE/HealthHoney/9HoneyMedicineReview.pdf> (last accessed 20/1/2020).
19. Ismaiel S, Al-Kahtani S, Adgaba N, Al-Ghamdi A.A, Zulail A, et al. (2014) Factors that affect consumption patterns and market demands for honey in the Kingdom of Saudi Arabia. *Food and Nutrition Sciences*. 5: 1725-1737.
20. Zulail A, Ismaiel S, Al-Kahtani S, Al-Ghamdi AA, Adgaba N (2014) Qualitative factors affecting the Price and demand of honey in Saudi Arabia. *Australian J. Basic Applied Sciences* 8: 199-206.
21. Belay A, Solomon WK, Bultossa G, Adgaba N, Melaku S (2015) Botanical origin, colour, granulation, and sensory properties of the Harennna forest honey, Bale, Ethiopia. *Food Chemistry* 167: 213-219.

22. Roman A, Popiela-Pleban E, Kozak M., Roman K (2013) Factors influencing consumer behavior relating to the purchase of honey, part 2. Product quality and packaging. *J. Apicultural Sci* 57: 175-185.
23. Cosmina M, Gallenti G, Marangon F, Troiano S (2016) Reprint of "Attitudes towards honey among Italian consumers: A choice experiment approach". *Appetite* 106: 110-116.
24. Roman A, Popiela-Pleban E., Kozak M (2013) Factors influencing consumer behavior relating to the purchasing of honey, part 1. The buying process and the level of consumption. *J. Apicultural Sci* 57: 159-172.
25. Pocol CB, Mařghitas LA (2010) Honey Market in European Union. In *National and International Trends Regarding Production and Consumption of Honey* (ed. by C.B. Pocol) 10-11.
26. Šánová P, Svobodová J, Hrubcová B., Šeráková P (2017) Segmentation of Honey Buyers' Behaviour by Conjoint Analysis. *Scientia Agriculturae Bohemica* 48: 55-62.
27. Pocol CB, Teselios CM (2012) Socio-Economic Determinants of Honey Consumption in Romania. *J. Food Agricult. Environm* 10: 18-21.
28. Gyau A, Akalakou C, Degrande A, Biloso A (2014) Determinants of consumer preferences for honey in the democratic Republic of Congo. *J. Food Products Marketing* 20: 476-490.

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