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# Analysis of Consumers' Willingness to Pay for Organic and Local Honey in Serbia

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**Abstract:** In times of increased concern for human health and care for the environment, it is important to investigate the consumer behavior models in order to better manage the product supply. From the perspective of our research, it is important to learn about consumer attitudes, of a specific product, such as honey, so as to potentially strengthen the economic position of honey producers. The purpose of this article was to explore the consumers' perceptions of organic and local honey in the Republic of Serbia and identify factors that contribute to predicting consumers' willingness to pay (WTP) for organic and local honey. The ordinal regression was used to determine which factors influence the WTP for organic and local honey, and the findings show that the consumers were WTP more for organic honey than for local honey. Socio-economic characteristics of respondents and honey attributes affect consumers' WTP. The higher monthly household income positively influences the WTP for organic honey, while on the other hand, the higher level of education has a positive influence on the WTP for local honey. The WTP for organic honey positively affected by the perceived importance of honey attributes, such as food safety and support for the local community. The frequency of the purchase of the local honey, the recommendations for the local honey purchase and the perceived importance of attributes, such as the care for the environment and nutritional properties, have a positive influence on the consumers' WTP for local honey. From this, we can conclude that our understanding of all the factors that influence a consumer's decision to allocate budget expenses for honey can help all stakeholders in creating an adequate pricing and promotional strategy for honey products.

**Keywords:** willingness to pay; honey; organic; local; Serbia

## 1. Introduction

Natural resources provide the Republic of Serbia with the possibility of more intensive development of organic production. Simić [1] points out that the country has favorable ecological, climatic, and technical conditions to produce traditional berries and fruits, as well as organic vegetables, fruits, cereals, and oilseeds. According to the Directorate for National Reference Laboratories, Organic Production Group, in the Republic of Serbia the share of areas under organic production in previous years has had a substantial rise (with a registered increase of 204% in organic production from the year 2012 till 2018) [2]. Lazić [3] classified organic production by farm size and type. Berenji, Milenković, Kalentić, and Stefanović [4] indicate that characteristics of organic farms differ by the production region and that in the Province of Vojvodina the average organic farm is larger than 10 ha with a specialization in a smaller number of plant species (cereals, industrial plants and vegetables).

The food market in the Republic of Serbia is dominated by locally produced foods [5–8], both organic or conventionally grown. They are positioned in the market, either as complements or substitutes. The consumers in the Republic of Serbia prefer the attributes of quality, freshness and taste, but are also increasingly concerned about food safety [9–12]. Consumers tend to prefer certified products, because they consider that the certificate indicates the notion of food safety [13]. They believe that local products contribute to halting biodiversity loss [5], and improving ecosystems. The consumers who are concerned about the environment consider the organic products safe from the pesticide and GMO aspects. There is still some skepticism surrounding the organizations that are responsible for monitoring food safety and pesticide levels, which can potentially influence the consumers' willingness to pay (WTP) levels. On the other hand, there is a belief that the consumption of local products has a positive impact on the development of the local economy, as it supports the local agricultural producers and employment. Because more than 80% of Serbia is rural, and the dominant agricultural production has low productivity, it is important to conserve and sustainably use the existing resources. Previous research by Cvijanović and Ignjatijević [14] points out that it is necessary to conduct further analysis of the impact of the honey sector on rural development. In recent years, the Republic of Serbia has seen an increase both in honey production and export of honey [15–17]. Local honey from the territory of Fruška Gora, Homolja, and Šumadija has the potential for branding and recognition in the domestic and international markets [15]. Consequently, an increase in honey consumption would lead to an increase in production, and would have a positive impact on the economic development of the honey sector, local areas, and the country itself.

In the Serbian market, the consumers can differentiate between organically produced and locally produced honey (also with a geographical origin). The first aspect of honey refers to organic honey production, therefore the consumers are aware that organic honey, as well as all organically produced foods, are controlled during the production process and that they do not contain harmful substances, GMO residues, drug residues, etc. Another aspect relates to the authenticity of geographical and botanical origins. Thus, honey from certain geographical regions or from the local area is associated with a well-known local producer's brand. The largest number of consumers is interested in consuming high-quality products, such as honey, that is new and has specific flavors, also of organic origin expressing a willingness to pay a higher price [18,19]. The WTP is also determined by socio-economic factors (gender, age, income, and education), so lower-income consumers in the Republic of Serbia have pointed out that the organic products are too expensive and income levels are still the main limiting factors affecting demand for organic food products [20].

In Serbia, the WTP has been researched in recent years by a small number of authors, and on the other hand, such an analysis is focused on a limited number of food products. Such a situation imposes the need to shed light on the factors influencing consumer behavior with regard to WTP for specific food products, especially honey. The identification and understanding of consumer behavior, that is, the perceptions of local and organic products and the factors that influence the purchase and consumption decision-making processes have so far not, to our best knowledge, been investigated. Many authors have been investigating problems in the production and consumption of honey from various aspects. Some authors point to oscillations in honey production [15–17], others point to differences in consumption motives and preferences [6,7,12,21,22] interconnectedness of the honey production and the environment [8,23–25], the impact of the honey production on the employment [26–30], and the local regional development [31,32]. Their findings show that honey is considered to be a healthy and safe product [33], which consumers eat if they nurture healthy lifestyles and are committed to preserving the environment and local community progress.

The subject of the research has been to evaluate the consumer's willingness to pay for local and organic honey, while assessing whether the socio-demographic characteristics and attributes of organic and local honey affect the consumers' WTP. The current study contributes to the relevant literature in two important ways. The authors have investigated honey, which is considered extremely important for human health and for the environment. The choice of this product is motivated by the

fact that Serbia is one of the largest producers of honey and that the production is steadily increasing registering an increase in the production of the organic honey and the geographical origin honey [15,17]. Second, the consumers' perceptions and willingness to pay for the local and organic honey in the Republic of Serbia have not been investigated so far. The specific objectives of the research paper are to: (1) Investigate the current organic and local honey perceptions in the Republic of Serbia; (2) assess Serbian consumers' willingness to pay (WTP) for the organic and local honey; and (3) identify factors that contribute to predicting the consumers' WTP for the organic and local honey. In the light of above mentioned, this research paper seeks to answer several important questions that are presented as formal hypotheses:

**Hypothesis 1 (H1).** *The consumers are willing to pay more for organic honey than for local honey.*

**Hypothesis 2 (H2).** *Consumers' education and monthly household income positively affect the WTP for organic and local honey.*

**Hypothesis 3 (H3).** *Consumers' WTP for organic and local honey is positively affected by the perceived importance of honey attributes.*

Due to the importance of honey and the modest results of previous research on honey consumption in Serbia, the obtained results fill the gap in knowledge about the preferences of honey consumers. As there are no previous comparative studies on the consumption of local and organic honey in Serbia, the findings of this study will be of interest to authors and researchers, on the one hand, the producers and the distributors of honey on the other, and potentially to the representatives of state authorities. The results of the research indicate the reasons behind the choice of honey and highlight the diversity of motives for buying and consuming organically produced or local honey. Understanding the preferences of honey consumers, especially WTP, can serve in creating a marketing strategy for beekeepers, policies to encourage organic production incentives and/or to create strategies for local development and define incentive measures for honey production. Given the favorable conditions and long tradition in honey production [27,34,35], the cooperation between science, the real sector and state representatives is especially important. Finally, the arguments presented speak of the need to adequately manage the market supply in response to increased consumer demands. The paper is structured as follows: The introduction points out the need, importance and aspects of research and sets out hypotheses. Then, the authors review the current literature and available research on WTP for organic and local products. In the following section, the authors present the methodology, the research findings, and a discussion of the results. The final section provides concluding remarks.

## 2. Literature Review

### 2.1. WTP for Organic Products

The first study on consumer attitudes regarding certified pesticide-free fresh produce in the United States, by Ott [36], showed that the majority of respondents were willing to pay 5% to 10% more than the standard price, in order to buy certified fresh pesticide-free products. The identified consumer target were highly educated consumers, who earned an average or above-average income. WTP research on radiation-treated food products in the United States, by Malone [37], used a probit regression model, and identified that three variables were significantly associated with the consumption of the irradiation-treated food products—education, income, and gender. Further research on WTP for organic food products in the United States was conducted by Jolly [38], who analyzed the views of organic food consumers in California, using an analysis of variance (ANOVA). They found that the WTP varied by product type, and depended on the conventional price of the product. Misra, Huang, and Ott [39] have used a probit regression model to analyze Georgia consumers' attitudes toward organic food consumption, and their findings show that socio-economic factors (race, age,

income, and education) are among the factors that have a significant impact on the WTP for organic products. The findings of Buzby and Skees [40] (who used a national survey in the US), point out that female, younger respondents, and those less educated, had a higher WTP for the organic produce (while the household income, race, and size did not influence the WTP). The results of a survey of organic consumers in Norway by Wandel and Bugge [41] showed that over 70% of Norwegian organic consumers were willing to pay a price premium of 5%, while less than 10% of respondents were willing to pay 25% and more for the organic products. Gil, Gracia, and Sanchez [42] studied organic consumers in Madrid and Navarre, and found a WTP of 15% to 25% for organic fruits and vegetables. In Ireland, O'Donovan and McCarthy [43] found that 73% of Irish consumers were not prepared to pay more than 10% for organic meat, compared to conventionally produced meat. Millock, Hansen, Wier, and Andersen, [44] in Denmark, found that 51% of respondents indicated a different WTP for different types of organic foods, and their WTP ranged from 18.5% for organic minced meat, up to the 40% for the organic potatoes.

Radman [45] found that the majority of Croatian consumers have expressed the view that organic products are too expensive and their WTP was in the range of 11–20% over the price of conventionally produced food. The findings of Sakagami, Sato, and Ueta [46], in Japan, show that consumers who are concerned about fresh foods and prefer certified vegetables to conventionally grown vegetables, expressed a WTP ranging from 8–22%. Krystallis, Fotopoulos, and Zotosal [47] showed that Greek consumers WTP levels ranged from 55% for organic grape wine to 100% for organic oranges. Rodriguez, Lacaze, and Lupinal [48] point out that the Argentine consumer's WTP depends on the type of organic product. Haghjou, Hayati, Pishbahar, Mohammadrezaei, and Dashti [49] showed that 95% of Iranian respondents expressed a WTP between 5 and 24% on the price of conventional products, while the identified target market showed that the consumers were female, married, and with children under the age of 10. The findings of Attanasio, Carelli, Cappelli, and Papetti [50] showed that 50.6% of Italian respondents were willing to pay a lower price for the organic produce (in regard to the market price for a conventional product). Vietoris et al. [51] pointed out that consumers in Romania are willing to pay 5% to 10% more for organic food compared to the price of conventional food.

One of the first studies in the Balkans region included samples from Macedonia and Serbia [52]. It showed that the average consumer of organic products was 50 years old, had a university degree, earned an above-average income, and were living in a family (up to a maximum of 3 family members). They also had a WTP for organic products up to 30%. Vlahović, Puškarić, and Jeločnik [53] findings show that a small number of consumers in Serbia are regular buyers of organic products, due to the low purchasing power and high retail prices—which are the main factors limiting the demand and the consumption of organic products. According to a study by Vehapi [54], the majority of organic consumers in Serbia were WTP up to 20% over the cost of conventional products. Vlahović and Šojić [55] findings show that there is an increased interest in organic agricultural products in the Republic of Serbia, but organic food prices and respondents' income levels are still major limiting factors affecting demand for organic food products. Vehapi and Dolićanin's study [56] identified the potential organic consumer in Serbia: They had university or college degree, a monthly net household income that exceeded RSD 100.000,00, and a WTP up to 30% over the price of conventional products. Jovanović, Joksimović, Kaščelan, and Despotović [57] findings indicate that about 81% of Montenegro consumers are still not ready to pay a higher price for organically produced products. The consumers in the Republic of Serbia had an increased interest for value-added food products, and were willing to pay a premium price for organic products up to 20% [19].

## 2.2. WTP for Local Products

On the other hand, the term “local food” can be linked to a concept of natural goods or services produced or provided by different enterprises in rural areas with an established socio-economic identity [58]. However, the consumers show great variation in the definition of the “local food”. It is interesting that the majority of food consumers have associated the term “local” food with

the term “foods grown locally” [59]. As far as the distance for the local produce is concerned, it may differ in case of fresh and processed products [60]. In the UK, La Trobe [61] points out that local food products are regarded as produced and sold within a 30 to 40-mile radius of the market. In Europe, Karner [62] found that alternative local food networks, as an emerging European sector, differ from the conventional food system and large-scale agro-food enterprises in terms of their organizational structures, farming systems, territorial setting, food supply chains, policy support, focus on ‘quality’ of food and social, cultural, ethical, economic and environmental aspects. Guided by the idea of sustainable local development, the consumers are willing to pay more for the local product than for the organic product [63]. Local food consumers using direct channels (farmers markets, community-supported agriculture outlets, and roadside stands) reported a significantly higher WTP for local produce [64]. Nganje, Hughner, and Lee [65] findings show that local produce bearing the Arizona Grown label had a higher WTP than local produce labeled USDA-certified pointing out the brand association between local food and safe food. Gracia, De Magistris, and Nayga [66] elicited consumers’ WTP for local lamb, confirming that social influence affects WTP values. Grebitus, Lusk, and Nayga [67] findings show that the belief to support the local economy, when buying food that traveled fewer miles, affects positively both the consumers’ WTP and the consumers’ perceptions that fresh local food has superior attributes. As females are the main household shoppers, their attitudes towards organic, local, GM-free, and U.S. grown are also stronger [68].

The studies that have focused on analyzing consumers’ attitudes towards organic, local or other types of food have focused on different kinds of fresh produce (apples, tomatoes, blueberries, potatoes, corn, etc.). The findings of Costanigro, McFadden, Kroll, and Nurse [69] have shown that the consumers’ WTP for local apples is higher than their WTP for organic apples. The findings on German consumers show that the WTP for the local organic food label is higher than the WTP for EU organic declaration [70]. The findings of Onken, Bernard, and Pesek [71] on the influence of purchasing venue on WTP for strawberry preserves at US farmers market, in five states, show that consumers have expressed a higher WTP for natural preserves than for the organic produce. Gracia, Barreiro-Hurlé and López-Galán [72] in their research on whether local and organic claims are complements or substitutes show that consumers are willing to pay a positive premium price for an enhanced method of production and the proximity of production, while the consumers with a higher WTP for origin related attributes valued higher the local claim (but when combined with other claims, the most valued combination is local plus organic). The findings on WTP of conventional and organic potatoes and sweet corn and its’ versions with two individual organic parts (such as no use of pesticides and non-GM) show that all versions of each food were viewed as substitutes for one another and the consumers were willing to pay significant premiums for organic and its’ parts in regard to conventional versions [73]. Onozaka and McFadden [74] analysis of differential values and interactive effects of sustainable production claims and location claims (local, domestic, not local and imported), elicited through a conjoint choice experiment, have shown that if the Gala apples are produced both organically and locally the WTP values range from 9% to 15% price premium. USA consumers have expressed positive WTPs for the attributes of ‘organic’ and ‘locally produced’ blueberries, although a higher WTP for organic than for the locally produced blueberries has been expressed [75]. Dominican consumers are willing to pay 17.5% more for organic and 12% more for locally grown produce [76]. The authors’ findings on elicited consumer WTP for local and organic attributes for fresh tomatoes show that the average premiums the consumers were willing to pay for organic tomatoes and locally grown tomatoes were about the same [77]. The findings of Tempesta and Vecchiato [78] on WTP for milk have shown that the higher amount of milk consumed brings about a reduction of WTP of 26%.

Cicia and Colantuoni [79] by meta-analysis on 23 studies have shown that “on-farm traceability” is important for consumers and that they are willing to pay a premium of 16.71% over the base price to be fully informed on the “meat’s production path”. The findings on WTP for a country-of-origin labeling program show for the consumers WTP for the U.S. certified steak and hamburger is equivalent to 38% and 58% [80]. The findings on the importance of the country of origin in food consumption in a

developing country have shown that the majority of consumers consume imported foods because of the lower price or good price/quality ratio and that the origin was more significant than either the price or the packaging in the decision to purchase beef [81]. The principal-component analysis reveals that the strong association of local and organic apples labels with the desirable environmental and food safety outcomes, combined with the distrust for the government agencies responsible for monitoring food safety and pesticide levels, is the most important predictor of consumers' WTP [82].

### 3. Materials and Methods

According to Breidert, Hahsler, and Reutterer [83], the concept of consumer willingness to pay for a product or service is used when formulating competitive strategies and developing new products. Many methods for measuring WTP have been presented in the scientific literature. There are two main groups of non-market valuation techniques in the scientific literature: Revealed preferences (RP) techniques that observe consumer behavior and their choices in the real market, and stated preferences (SP) techniques used to elicit individual reported preferences over hypothetical alternatives. Boccaletti and Nardella [84] point out that the contingent valuation method allows a direct evaluation of the WTP. The consumers should indicate their WTP without purchasing a hypothetical product. With this method, the consumer is directly asked to state their WTP for a particular good or service. Carson and Hanemann [85] point out that this method has become known as "conditional valuation", as the "valuation" estimate obtained from preferential information is a "conditional" valuation of an environmental good within the "built market for research purposes". The most commonly used questionnaire formats for measuring WTP are direct (open) questions, discrete choice experiments [86–89], bidding games, payment card system and referendum question format [90]. The authors have tested four WTP elicitation methods the Becker–DeGroot–Marschak mechanism, multiple price lists, multiple price lists with stated quantities, and real-choice experiments, and their findings were closely related [91]. In the present survey, the authors have opted for a payment card system as the consumers were asked in the survey to indicate predesigned price premiums (nothing more (1); up to 10% more (2); 10–20% (3); 20–30% (4); more than 30% (5)) expressing the willingness to pay for local and organic honey.

The total number of consumers investigated was 1000. Of the distributed questionnaires, 788 consumers of organic and local honey consumer questionnaires were returned complete (79% response rate). Before the data collection, the questionnaire was tested in cooperation with the Association of Beekeeping Organizations of Serbia and Vojvodina to improve its validity and reliability. Data collection began in September 2019 and finished in January 2020. In the consumers' survey, the authors have used the snowball method as a random sampling technique. The questionnaire, or link of the questionnaire, was sent to the initial seed informants within the researchers' professional and personal network, in order to be further distributed [92,93]. The previous research [94] has shown that the snowball method is suitable for exploring under-researched topics, where the knowledge and awareness of the product is not sufficiently explored. The questionnaire was created according to questionnaires from the relevant researchers on the topic of examining consumers' WTP [19,76,95–101]. The first part of the questionnaire is based on the collection of socio-demographic data of the respondents, including characteristics such as gender, age, qualifications, level of monthly income, and presence of children and parents in the household. The second part of the questionnaire is focused on the general characteristics of consumer behavior when buying organic and local honey: frequency of buying the honey, the place of the honey purchase, and the recommendations of other people that influence the honey purchase. The third part involves eliciting consumers' willingness to pay more for the organic and local honey using a five-point scale (nothing more, up to 10%, 10–20%, 20–30% and more than 30%). The fourth part deals with the respondents' perceptions of intrinsic and extrinsic attributes of honey, such as taste, health, environmental care, food safety, nutritional properties, price, and support to the local community (interval level from 1–5).

Model explanatory variables include socio-demographic variables, such as gender (male—1, female—2), age (five intervals: 1—lowest and 5—oldest), monthly household income (four intervals:

1—lowest, 4—highest), education level (three intervals: 1—lowest, 3—highest), and the presence of children and parents in the household (four intervals: 1—no children and parents, 2—children in the household, 3—parents in the household 4—both children and parents in the household). The model explanatory variables are also general honey purchase variables, such as the place of shopping of organic honey (1—manufacturer, 2—health food stores, 3—specialized stores, 4—large supermarkets, 5—markets), the frequency of purchase of organic honey (1—once in six months, 2—once in three months, 3—once a month, 4—once in every two weeks), the recommendations for the organic honey purchase (1—doctors, 2—friends, 3—mass media, 4—family, 5—I decide by myself), as well as the respondents' opinions concerning general honey attributes (5 intervals: 1—lowest, 5—highest): 'I eat honey because it tastes good', 'I eat honey because it is good for health', 'I think that honey consumption helps the environment', 'I am very concerned about my food safety', 'I eat honey because of its nutritional properties', 'the price of honey is important to me', 'honey consumption is beneficial to the local community'. The dependent variable in the models is the WTP for organic and local honey (five intervals: 1—0%, 2— <10%, 3—10–20%, 4—20–30%, 5—>30%).

The statistical package SPSS (Statistical Package for Social Sciences) was used to analyze the data of this study. In all statistical tests, the significance threshold ( $\alpha$ ) was set at 5%. Descriptive statistics (frequencies and percentages) have addressed the socio-demographic and consumer characteristics and their perceptions of local and organic honey. To test the hypotheses, we used ordinal regression analysis to determine which factors influence the WTP for organic and local honey. The ordinal regression is a statistical method that examines the influence of multiple independent factors on a single dependent factor [102]. The ordinal regression equation is defined by (1):

$$\ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \quad (1)$$

where the independent factors are  $X_i$ , the regression coefficients are  $\beta_i$  and  $p$  the probability that the event has occurred. In this case, the dependent factor is binary.

However, when the ordinal type variable is dependent with more than two categories, then we define the final cumulative logit model as (2):

$$\ln\left(\frac{p(Y \leq j)}{1-p(Y \leq j)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \quad (2)$$

where:  $X_i$  = independent (explanatory) variables or predictors;  $\beta_i$  = regression coefficients or parameters;  $p$  = the probability of an event occurring;  $Y$  = dependent variable divided into  $j$  categories.

We have decided to apply the Ordinal Regression [103,104] with the cumulative logistic regression model (with the increasing outcome), that is, the "proportional odds model". This model converts the ordinal scale into a series of binary cut-off values (the number of these cut-off values is always one less than the number of categories of the dependent variable). Each cut-off value, i.e., critical points of separation or classification criteria represent a threshold that must be crossed to move from one category of criteria to another. Proportional odds models assume that the true regression coefficients (beta) are the same in all models and that the only difference between the models is the cut-off values. The standard interpretation of ordinal logit coefficients is that the regression parameter expressed in ordinal logit (odds logarithm) with each independent variable shows the expected degree of change of the ordinal dependent variable, when the observed independent variable increases by one unit, while the other independent variables are constant. The positive values of beta indicate higher odds of moving to the next higher ordered category for higher values of the independent variable. The final model incorporates certain predictor variables and has undergone iterative processes that account for the maximum likelihood function and parameter estimates. The requirements that are required to complete in order to achieve Multidimensional Ordinary Logistic Regression are:

The dependent variable must be an ordinal scale, which means it should be displayed in encoded categories, which must be ranked: Independent variables are interval, nominal or ordinal scales; Multidimensionality should not exist between independent variables; Proportional Odds—each independent variable must have the same effect.

The authors have checked the assumptions of the validity of ordinal regression by applying the models with proportional odds. The following models have all been satisfied: model fitting; goodness-of-fit, including the Pearson and deviance goodness-of-fit tests; the Cox and Snell, Nagelkerke, and McFadden measures of R<sup>2</sup>; the likelihood-ratio test, and the assumption of parallel lines.

#### 4. Results

The results of the descriptive statistical analysis indicate that in the sample of 788 respondents, the majority are female (58.4%). The female respondents are more willing to participate in the research—this can be due to the fact that they are more involved in purchasing food for the whole family. The average consumer belongs to the age group of 20–30 years (39.7%) with a significant percentage (39.8%) of respondents in the age group of 31–50 years. Most consumers have a high school diploma (41.6%), followed by a professional college degree and higher education degree (Ma, PhD) (32.6%). The highest percentage of respondents has an average income of less than 500 euros a month and lives with their children in the household (36.5%) (Table 1).

**Table 1.** Socio-demographic characteristics of respondents.

Socio-Demographic Characteristics	Category	Number of Respondents	Percentage (%)
Gender	Male	328	41.6%
	Female	460	58.4%
Age	<20	57	7.2
	20–30	313	39.7
	31–40	184	23.4
	41–50	129	16.4
	More than 50	105	13.3
Level of Education	High school	328	41.6
	Professional degrees	203	25.8
	Bachelor's degrees and other (Masters, PhD)	257	32.6
Monthly Income	<500 euros	334	42.4
	501–1000 euros	168	21.3
	1001–2000	152	19.3
	>2000	134	17.0
Presence of Children and Parents in the Household	I have children and parents living in the household	56	7.1
	I have children living in the household	288	36.5
	I have no children and parents in the household	214	27.2
	I have parents living in the household	230	29.2

In the continuation of the descriptive analysis (Table 2) the WTP for organic and local honey, place and frequency of purchase, as well as the recommendations for purchase for organic and local honey, have been presented. The results indicate that the majority of the respondents (44.9%) are willing to pay premium prices of 20–30% for the organic honey over the price of conventional honey. For local honey consumers, the percentages of respondents that are willing to pay 20–30% more is significantly lower (17.5%), while the majority is willing to pay 10–20% more for the local honey. The consumers buy organic honey in speciality stores and large supermarkets, while the local honey is most commonly bought at local markets. The organic honey is usually purchased once every three months, while the local honey is purchased at least once a month. The majority of respondents decide on the purchase of organic and local honey by themselves (53.9% and 43%, respectively), although recommendations for



the organic honey purchase are also accepted from the family (24.5%) and for the local honey purchase from friends (34.3%).

**Table 2.** Questions related to general characteristics of honey consumption.

Questions Related to General Characteristics of Honey Consumption		Organic		Local	
		Fr *	%	Fr *	%
Willingness to Pay (WTP) more	0%	55	7.0	93	11.8
	<10%	92	11.7	235	29.8
	10–20%	243	30.8	293	37.2
	20–30%	354	44.9	138	17.5
	>30%	44	5.6	29	3.7
Place of Purchase of Honey	Markets	73	9.3	283	35.9
	Large supermarkets	261	33.1	203	25.8
	Specialized stores	387	49.1	175	22.2
	Health food stores	31	3.9	98	12.4
	Directly from manufacturer	36	4.6	29	3.7
Frequency of Purchase of Honey	Once in 2 weeks	54	6.9	245	31.1
	At least once a month	221	28.0	361	45.8
	Once in 3 months	330	41.9	112	14.2
	Once in 6 months	183	23.2	70	8.9
Recommendations for the Honey Purchase	From doctors	33	4.2	38	4.8
	From friends	116	14.7	270	34.3
	From mass media	21	2.7	33	4.2
	From my family	193	24.5	108	13.7
	I decide by myself	425	53.9	339	43.0

\* Frequency.

The consumers find honey to be good for their health (4.40) and of good taste (4.34). In the recent years, the consumer awareness that the honey production and consumption are linked to the support of the environmental conditions (4.14) and local development (4.09), has been substantially increased (Table 3). The consumers value honey in terms of food safety (3.99) and nutritional properties (3.90). The consumers also consider the price of honey to be a relevant factor in their purchase (3.96).

**Table 3.** Consumer-reported perceptions of honey attributes.

	It Tastes Good	It Is Good for Health	I Think That Honey Consumption Helps the Environment	I Am Very Concerned about My Food Safety	I Eat Honey Because of Its' Nutritional Properties	Price of Honey Is Important to me	Honey Consumption Is Beneficial to the Local Community
<b>Mean</b>	4.34	4.40	4.14	3.99	3.90	3.96	4.09
<b>Std.dev.</b>	0.902	0.823	0.891	0.948	1.026	1.104	0.940

#### 4.1. WTP for Organic and Local Honey

Chi-square test for an association has been used to determine if there is an association between the variables of WTP for organic/local honey and the consumers' socio-demographic characteristics (Table 4).

**Table 4.** Chi-square test for association.

	WTP Organic—Chi-Square Value	WTP Local—Chi-Square Value
Gender	26.661; df (4); $p = 0.000$ *	5.327; df (4); $p = 0.255$
Age	15.597; df (16); $p = 0.481$	21.399; df (16); $p = 0.164$
Level of Education	14.457; df (8); $p = 0.041$ *	10.121; df (8); $p = 0.257$
Monthly income	14.013; df (12); $p = 0.300$	61.034; df (12); $p = 0.000$ *
Presence of children and parents in the household	9.046; df (12); $p = 0.699$	11.785; df (12); $p = 0.463$
Place of purchase of organic/local honey	34.808; df (16); $p = 0.004$ *	53.680; df (16); $p = 0.000$ *
Frequency of purchase of organic/local honey	6.604; df (12); $p = 0.883$	207.079; df (12); $p = 0.000$ *
Recommendations for the organic/local honey purchase	11.848; df (16); $p = 0.754$	20.138; df (16); $p = 0.214$

\* statistically significant at  $p < 0.05$  level.

Significant associations were determined between the WTP for the organic honey and gender ( $p = 0.000$ ) and the WTP for the organic honey and the level of education ( $p = 0.041$ ). As for the local honey, the significant associations were determined between the WTP for the local honey and the respondents' monthly income ( $p = 0.000$ ). As a next step, the chi-square test for association has been used to determine if there is an association between the WTP for the organic and the local honey and the general characteristics of honey purchase (Table 4). A significant association was determined between the WTP for the organic honey and the place of purchase of organic honey ( $p = 0.004$ ). The significant associations was found between the WTP for the local honey and the place of purchase of local honey ( $p = 0.000$ ), as well as between the WTP for the local honey and the frequency of purchase of local honey ( $p = 0.000$ ). The significant association was also tested on the variables of the WTP for the organic and the local honey and the perceived honey attributes. The significant association was determined between the WTP for the organic honey and the perceived honey attribute taste ( $p = 0.042$ ) and the WTP for local honey and the perceived honey attribute taste ( $p = 0.008$ ), health ( $p = 0.000$ ), concern for the environment ( $p = 0.000$ ) and the food safety ( $p = 0.001$ ), that are presented in Table 5.

**Table 5.** Chi-square test for association.

	WTP Organic Honey	WTP Local Honey
I eat honey because it tastes good	14.854; df (8); $p = 0.042$ *	32.787; df (8); $p = 0.008$ *
I eat honey because it is good for health	5.372; df (8); $p = 0.717$	47.510; df (8); $p = 0.000$ *
I think that honey consumption helps the environment	9.318; df (8); $p = 0.316$	51.482; df (8); $p = 0.000$ *
I am very concerned about my food safety	9.352; df (8); $p = 0.313$	40.555; df (8); $p = 0.001$ *
I eat honey because of its' nutritional properties	5.010; df (8); $p = 0.757$	19.103; df (8); $p = 0.263$
The price of honey is important to me	12.880; df (8); $p = 0.116$	22.315; df (8); $p = 0.133$
Honey consumption is beneficial to the local community	13.317; df (8); $p = 0.101$	19.528; df (8); $p = 0.242$

\* statistically significant at  $p < 0.05$  level.

#### 4.2. Ordinal Regression Models

By using the ordinal logistic regression with the logit link function, we assume that the effect of the independent variables shall be the same for each level of the dependent variable (WTP). Before interpreting the model's regression coefficients, the assumptions regarding model adequacy must be examined. Using the PLUM procedure in SPSS—first, we have checked whether the final models improve the outcome prediction. To confirm this, we have analyzed the model fitting information model. In Table 6, we have received information about whether the models of the logit link function improve the ability to predict the resulting variable. Based on the results obtained from model fitting we can conclude that the statistical significance of the models is present and that the models with predictor variables make a significant contribution to the prediction of the dependent variable consumers' willingness to pay for organic honey (Models 1 and 2) and consumers' willingness to pay for local honey (Models 3 and 4).

**Table 6.** Model fitting information for the WTP for organic and local honey models.

Dependent Variable	Model Explanatory Variables	Model	-2 Log Likelihood	Chi-Square	Df	Sig.
1. WTP organic honey	Socio-demographic variables	Intercept only Final	1453.608 1431.896	21.712	13	0.020
2. WTP organic honey	Organic honey purchase and honey attributes variables	Intercept only Final	1901.113 1864.887	36.226	39	0.05
3. WTP local honey	Socio-demographic variables	Intercept only Final	1901.113 1864.887	36.226	39	0.040
4. WTP local honey	Local honey purchase and honey attributes variables	Intercept only Final	2109.694 1982.423	127.270	39	0.00

Link function: Logit.

#### 4.2.1. WTP for Organic Honey

Model explanatory variables include gender (male—1, female—2), respondent age (five intervals: 1—lowest and 5—oldest), monthly household income (four intervals: 1—lowest, 4—highest), education level (three intervals: 1—lowest, 3—highest) and presence of children and parents in the household (four intervals: 1—no children and parents, 2—children in the household, 3—parents in the household 4—both children and parents in the household) and the dependent variable in the model is the WTP for organic honey (five intervals: 1—0%, 2—<10%, 3—10–20%, 4—20–30%, 5—>30%). The estimation results of the Ordered Logit model has been presented in Table 7. We have first analyzed the influence of independent socio-demographic predictors on the dependent variable (WTP for organic products). Multicollinearity detection was then performed using VIF (Variance Inflation Factor). Multicollinearity was not present in the model. Therefore, we have decided to keep all the predictor variables in our ordinal logistic regression model. We have further tested whether the final model, which included all explanatory variables improves the outcome of the base model. We started from the null hypothesis that the fit is good. As we did not reject this hypothesis ( $p > 0.05$ ), we have concluded that the data and the model predictions are similar and that we have a good model ( $\chi^2 (1067) = 1102.13; p = 0.22$ ). The values of the coefficient of determination (Pseudo R2) have indicated a 17.4% Nagelkerke variance of the model was explained by the explanatory variables. In addition to the results of assumptions regarding the model adequacy, we have performed a test of parallel lines. If the general model gave a significantly better fit to the data than the ordinal (proportional odds) model ( $p < 0.05$ ), then we could be led to reject the assumption of proportional odds. The assumption of good fit of the ordinal model was confirmed by the result ( $\chi^2 = 66.70, df = 39, p = 0.06$ ). The process of verifying the adequacy of the model has been fully completed. When analyzing the final Model in Table 7, the statistical significance was found for only one variable of the five explanatory variables. The monthly household income has proven to be a significant explanatory variable (in the second category of monthly household income of 501–1000 euros). Given that the obtained regression coefficient is less than 1, we come to the conclusion that the monthly household income and the willingness to pay for organic honey are negatively correlated. Based on the B value for the explanatory variable the monthly household income, provided that all other predictors in the model are kept constant, we can say that the likelihood of the willingness to pay for the organic honey of the respondents in the second category with a monthly income of 501–1000 euros decreases by 0.10 compared to those with a monthly income of over 2000 euros.

**Table 7.** Results of the final model obtained by ordinal regression (Model 1–4).

Regression Models 1–4		B	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound	Exp(B)
(Model 1)	Monthly Household Income = 3	−0.099	0.232	1.182	1	0.046 *	−0.356	0.554	0.104
(Model 2)	I am very concerned about my food safety = 3	−0.700	0.241	8.466	1	0.004 *	−1.172	−.229	0.496
	Honey consumption is beneficial to the local community = 4	−0.383	0.183	4.367	1	0.003 *	0.024	0.743	0.467
(Model 3)	Education = 2	−0.298	0.179	2.781	1	0.040 *	−0.649	0.052	0.742
(Model 4)	Once in 3 months = 2	−0.621	0.254	5.971	1	0.015 *	−1.119	−0.123	0.537
	From my family = 4	0.544	0.207	6.879	1	0.009 *	0.137	0.950	1.723
	I think that honey consumption helps the environment = 1	−2.228	1.194	3.482	1	0.042*	−4.568	0.112	0.108
	I eat honey because of its nutritional properties = 4	−0.325	0.187	3.027	1	0.042 *	−0.691	0.041	0.723

\* statistically significant at  $p < 0.05$  level.

In a second model, model explanatory variables are the variables reflect the respondents opinions concerning the following: Place of shopping of organic honey (1—manufacturer, 2—health food stores, 3—specialized stores, 4—large supermarkets, 5—markets); frequency of purchase of organic honey (1—once in six months, 2—once in three months, 3—once a month, 4—once in every two weeks); recommendations for the organic honey purchase (1—doctors, 2—friends, 3—mass media, 4—family, 5—I decide by myself), as well as the respondents opinions concerning general honey attributes (5 intervals: 1—lowest, 5—highest): ‘I eat honey because it tastes good’, ‘I eat honey because it is good for health’, ‘I think that honey consumption helps the environment’, ‘I am very concerned about my food safety’, ‘I eat honey because of its nutritional properties’, ‘the price of honey is important to me’, ‘honey consumption is beneficial to the local community’, and the dependent variable in the model is WTP for organic honey (five intervals: 1—0%, 2—<10%, 3—10–20%, 4—20–30%, 5—>30%). Multicollinearity detection by VIF (Variance Inflation Factor) has shown that no multicollinearity was present in the model. Therefore, we have further tested the final model starting from the null hypothesis that the fit is good. Goodness-of-Fit with  $\chi^2$  test ( $p > 0.05$ ) has shown that we have a good model ( $\chi^2(2621) = 2593.32$ ;  $p = 0.65$ ). The value of the coefficient of determination (Pseudo R2) has indicated 48% Nagelkerke variance of the model was explained by the independent variables. In addition to the results of assumptions regarding the model adequacy, we have performed a test of parallel lines ( $\chi^2 = 1636.83$ ,  $df = 117$ ,  $p = 0.07$ ). When analyzing the final Model 2 in Table 7, the statistical significance was found for only two variables of the ten predictor variables. Respondents’ perceived importance of Food Safety and Support of the Local Community in honey consumption have proven to be significant explanatory variables. Given that the obtained regression coefficient for the perceived food safety importance is less than 1, and based on its’ Exp (B) value, provided that all other predictors in the model are kept constant, we can say that the likelihood of the willingness to pay for organic honey of respondents who have rated the claim “I am very concerned about my food safety” with the mark 3 decreases by 0.49 compared to those respondents who have rated food safety of honey with the mark 5. Having in mind, that the obtained regression coefficient for the claim “Honey consumption is beneficial to the community” is also less than 1, and based on its’ Exp (B) value, provided that all other predictors in the model are kept constant, we can say that the likelihood of the willingness to pay for the organic honey of the respondents who have rated the claim “Honey consumption is beneficial to

the community” with the mark 4 decreases by 0.46 compared to those respondents who have rated the same claim with the mark 5.

#### 4.2.2. WTP for Local Honey

In the third model, we have started from the analysis of the influence of independent socio-demographic predictors on the dependent variable (WTP for local honey). We started from the null hypothesis that the fit is good, and the goodness-of-fit with  $\chi^2$  test ( $p > 0.05$ ) has shown that we have a good model ( $\chi^2 (1067) = 1194.32; p = 0.078$ ). The values of the coefficient of determination (Pseudo  $R_2$ ) have indicated that 29% of Nagelkerke variance of the model was explained by the independent variables. In addition to the results of assumptions regarding the model adequacy, we have performed a test of parallel lines ( $\chi^2 = 101.82, df = 39, p = 0.08$ ). When analyzing the final Model 3 in Table 7, the statistical significance was found for only one variable of the five explanatory variables. The level of education has proven to be a significant explanatory variable in Model 3. Given that the obtained regression coefficient is less than 1, we have come to the conclusion that education and the WTP for local honey are negatively correlated. Based on the Exp (B) value for the explanatory variable ‘Education’, provided that all other predictors in the model are kept constant, we can say that the likelihood of the willingness to pay for local honey of the respondents with the professional college degree decreases by 0.74 compared to those respondents with the bachelor’s degrees and higher degrees (Masters, PhD).

As a next step, we tested by means of Ordered Logit model the WTP for the local honey and the variables that reflected the respondents’ perceptions on the general purchase of local honey and the honey attributes. As no multicollinearity was present in the model, we have further tested the final model. The Goodness-of-Fit with  $\chi^2$  test ( $p > 0.05$ ) has shown that we have a good model ( $\chi^2 (2685) = 1983.24; p = 0.98$ ) and the values of the coefficient of determination (Pseudo  $R_2$ ) have indicated 36% Nagelkerke variance of the model was explained by the independent variables. We have performed a test of parallel lines ( $\chi^2 = 1736.31, df = 117, p = 0.55$ ). When analyzing the final Model 4 in Table 7, the statistical significance was found for four variables of the ten predictor variables. The frequency of the purchase of the local honey, the recommendations for the local honey purchase and the perceived importance of preserving the environment and the nutritional properties in the honey consumption have proven to be significant explanatory variables. Given that the obtained regression coefficient for the frequency of purchase of local honey is less than 1, and based on its’ Exp (B) value, provided that all other predictors in the model are kept constant, we can say that the likelihood of the willingness to pay for the local honey of respondents who purchase honey once in three months decreases by 0.53 compared to those respondents who purchase honey once in every two weeks. Based on Exp (B) value for the recommendations for the local honey purchase, provided that all other predictors in the model are kept constant, we can say that the likelihood of the willingness to pay for the local honey of the respondents who accept recommendations from the family to purchase honey once a month increases by 1.72 compared to those respondents who decide by themselves. The likelihood of the willingness to pay for the local honey of the respondents who have rated the claim “I think that honey consumption helps the environment” with the mark 1 decreases by 0.10 compared to those respondents who have rated the same claim with the mark 5. The likelihood of the willingness to pay for the local honey of respondents who have rated the claim “I eat honey because of its nutritional properties” with the mark 4 decreases by 0.72 compared to those respondents who have rated the same claim with the mark 5.

## 5. Discussion

The results show that Serbian consumers were willing to pay more for organic honey than for local honey, which confirmed our first hypothesis. Hypothesis 1 has also been confirmed by the findings of other authors [75,76,105]. The significant associations were found between the WTP for organic honey and gender, as well as the WTP for organic honey and level of education. The concern

of mothers for their family [16,106–110] has determined that women are the most important honey buyers [111]. Our results are confirmed by Davies et al. [112] in Northern Ireland who have shown that women, ages 30–45, who have children and higher income are regular customers of organic products. The results obtained were confirmed by Storstad and Bjorkhaug [113] as a higher percentage of women in Norway was found to have positive attitudes towards organic food consumption. Padel and Foster [97] also identified that younger women in employment, as well as middle-aged women, were the major buyers of organic foods, as they are better informed of all aspects related to organic products, and reflect the standard gender divide related to the division of household chores, where women are still more involved in food preparation and family care. The research in the US has also concluded that younger and more educated women are more likely to be regular buyers of organic food [114]. In our research, the WTP for local honey has been determined to be 10–20% above the conventional price of honey. When the products are promoted as locally grown the consumers are willing to pay a price premium [115], therefore the WTP level, as well as the perception of the product quality, is influenced by the provided locally grown information. Therefore, when the consumers are given additional information, their willingness to pay a premium for local produce can increase.

The findings of Model 1 obtained by ordinal regression have shown that the higher monthly household income is a significant explanatory variable of the WTP for organic honey. This is also confirmed by the findings of other authors [112,116–119]. As expected, the frequency of organic purchases increases significantly with higher household incomes. Findings in Croatia [120], and in Serbia of Vlahović and Šojić [55], also confirm this hypothesis. Some authors believe that demographic variables, such as age, income, and education may more closely define organic consumers, but not significantly, as price continues to block organic food consumption [121]. We can conclude that consumers with higher income levels are more willing to buy (and pay more for) organic products. Moreover, the price of organic products and the level of respondents' income are still the main limiting factors in the Republic of Serbia, which influence the demand for organic products and households with higher income levels have shown a higher tendency to buy organic products. This is also confirmed by findings on the interconnectedness of the honey consumption and the income levels [122–124]. The significant association was found between the WTP for local honey and the monthly income. Thus, the price plays a significant role for consumers and is often linked to quality, the existence of certificates [125–130]. The findings of Model 3 show that only the higher level of education has proven to be a significant explanatory variable for predicting the WTP for local honey. This finding is confirmed by the results of Carpio and Isengildina-Massa [131] and Andam, Ragasa, Asante, and Amewu [132]. As expected, the respondents with higher education [124], value more the local honey consumption, and therefore, are willing to contribute to the development of the local honey community. Therefore, we can confirm the second hypothesis that higher education and higher monthly household income of consumers positively affect the WTP for organic and local honey.

The significant association was also found between WTP for local honey and the perceived honey attribute of taste, health, concern for environment and food safety. The perceived honey attribute of taste has been determined to be significantly associated with both WTP for organic honey and WTP for local honey. Good taste has been a motive for purchasing organic products as confirmed by Saba and Messina [133], Özcelik and Ucar [134], Hamzaoui, Essoussi, and Zahaf [135], Padel and Foster [97], Lea and Worsley [136], Brčić-Stipčević and Petljak [137], Vlahović and Šojić [55]. Taste has been an important feature of honey consumption [110]. The local honey consumers are concerned with the state of natural resources and the potential contamination of honey with GMO residues, pesticide residues and antibiotics [138,139]. They perceive honey as a healthy and safe product [140–142], and environmentally friendly [67,143]. More often they associate honey with the attributes of taste, color and appearance and consume honey because of its nutritional properties [144,145], which in this study was found to be associated with the WTP for local honey. The perceived attributes of food safety and support for the local community have proven to be significant explanatory variables of the WTP for organic honey (Model 2). This confirms the fact that WTP for organic honey is positively

affected by the perceived importance of honey attributes as the consumers are increasingly concerned with the food safety, as honey is a natural product [124,146–152]. The consumers of honey value the local community support [109,153,154]. The relative influence of the general purchase variables and honey attributes variables on consumers' WTP for local honey (Model 4) has determined the positive influence of the frequency of the purchase of the local honey, the recommendations for the local honey purchase [100,153–157], and the perceived attributes of the care for the environment and nutritional properties [141,158,159]. The third hypothesis is that the consumers' WTP for organic and local honey is positively affected by the perceived importance of honey attributes can be confirmed. On the other hand, the local community support has proven to influence the WTP of organic honey. Thus, the findings signal an increased environmental awareness of consumers of organic products in Serbia. The findings of Hamzaoui-Essoussi and Zahaf [135], as well as Padel and Foster [97], also show that the organic products consumers value the social aspect, such as support for local agriculture, fair trade, and environmental protection. Therefore, identifying other important factors of consumer behavior that accompany the decision to buy organic and local honey can help honey producers gain price premiums.

## 6. Conclusions

This research aimed to understand the preferences for the organic and local honey, and the respective willingness to pay, in a selected sample of consumers in the Republic of Serbia. The results of the statistical analysis according to the defined hypotheses have been duly presented, and the findings have shown which factors in the proposed model have significantly influenced the WTP for organic and local honey. We found that consumers perceived different factors as important for their purchase. The findings in the research in the Republic of Serbia can be potentially different from the research conducted in countries where the organic products market is in a mature stage of development. In line with the literature review, we have seen that the willingness to pay for agricultural products varies within the developed and underdeveloped markets, according to the consumer segments and different food products categories. The findings indicate that the respondents in Serbia are willing to pay 20–30% more for the organic honey, while their willingness to pay for the local honey is slightly lower (10–20% more for the local honey). The profile of honey consumers shows that they are predominantly female, having a high school diploma, an average income of less than 500 euros a month with the presence of children in the household. The consumers of honey value highly honey attributes and the perceived attribute of health, taste and the care for the environment were rated the highest. The higher monthly household income positively influences the WTP for the organic honey. The higher level of education has a positive influence on the WTP for the local honey. The WTP for organic honey is positively affected by the perceived importance of honey attributes, such as food safety and support for the local community. The frequency of the purchase of the local honey, the recommendations for the local honey purchase and the perceived importance of attributes, such as the care for the environment and nutritional properties, have a positive influence on the consumers' WTP for local honey. From this, we can conclude that understanding of all factors that influence a consumer's decision to allocate budget expenses for honey products can shed additional light and help all stakeholders in the honey production, processing and sales sectors. The above socio-demographic characteristics of the consumers that are willing to pay more for the organic or local honey could be used as a starting point for the creation of an adequate organic or local honey marketing strategy. Furthermore, it is necessary to further investigate the extent to which Serbian consumers of the organic and local honey products value the regional provenance. The labeling of different types of honey, and the additional information on organic and local honey, as well as the preference of direct contact with the honey producers, can potentially contribute to the higher WTP levels and should be further examined. As a direction of future research—due to the quite high acceptance among Serbian consumers for higher prices, it is worth conducting similar analyzes in other both developing and developed countries.

One of the limitations of this study is the study sample. This survey was limited to consumers in the Republic of Serbia. Another limitation might be the overstated willingness to pay more as consumers do not necessarily take into account all the factors they consider when making an actual purchase. The consumers' purchase decision at the point of sale takes into account the essential attributes of honey, but also the product availability on the point of sale, the latest recommendations, or their budget allocations at the time of purchase. The elicited willingness to pay is a conditional elicitation for research purposes. Thus, the elicited willingness to pay may not necessarily coincide with the consumers' willingness to actually pay a higher price for organic and local honey products at the point of sale.

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