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# CONSUMER'S CHARACTERISTICS AND ATTITUDES TOWARDS ORGANIC FOOD PRODUCTS IN TIMES OF COVID-19 PANDEMIC

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## ABSTRACT

The pandemic caused by the Covid-19 virus significantly affected the consumers' behavior. The subject of the paper is to analyze the consumer characteristics, the consumer attitudes towards organic food products, as well as the changes in the consumer behavior. The research was performed in 2021 in the Republic of Serbia. The statistical software package SPSS has been utilized for data analysis. Our findings show that, in times of COVID-19 pandemic, the consumers have a very positive perception of nutritional values of organic food products with an expressed willingness to pay 20–30% more for the organic products, in regard to conventional products. The main reason for buying such products is less chemistry and child health. The main reason for insufficient consumption is the high price. The monthly income of irregular consumers of organic food products has predicted the willingness to pay, while the household size has predicted the assessment of the organic products nutritional properties.

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## Introduction

In the year 2019, according to the official statistics of Eurostat (2020) the organic areas in the European Union have accounted for about 8,5% of the total EU agricultural land. Likewise, global sales of organic produce in the last 15-20 years have seen significant growth. Global tendencies point that its demand has registered significant growth even in the period of the Covid-19 pandemic. According to the official data of the Ministry of Agriculture, Forestry and Water Management of the Republic of

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Serbia (2019) the share of areas under organic production has had a registered increase of 204% in organic production from the year 2012 till 2018. In the mature organic products markets the research on consumer perceptions has been present for a long time, but in less developed countries organic products markets this type of research is at its beginning. The subject of the paper is to analyze the consumer characteristics, the consumer attitudes towards organic food products, as well as the changes in the consumer behavior in times of Covid-19 pandemic in the Republic of Serbia. The paper has been structured as follows. Firstly an overview of the literature has been presented. Secondly the authors have explained the conducted research method. The section comprising results obtained and interpretation of the results in the discussion is given subsequently. In the final part of the paper, the conclusion has been drawn.

### **Literature review**

Based on a comprehensive analysis of current empirical papers in developed organic markets the consumers are more concerned about the use of pesticides in conventional production and show a greater willingness to pay (WTP) a higher premium for organic produce (Jolly, 1991; Misra et al., 1991; Millock et al., 2004). Household income also influences the ability and regularity of organic purchases. Yiridoe et al. (2005, p.198) emphasize that “empirical evidence supports the hypothesis that product quality characteristics influence consumers’ preferences for organic food, with the following being the most important qualities: (1) nutritional value; (2) economic value; (3) freshness; (4) taste and smell; (5) maturity and (6) general appearance (especially of fruits and vegetables).” The findings from the USA by Thompson (1998), as well as by Thompson and Kidwell (1998), showed that the American consumers with the highest level of education were less willing to consume organic products than those with lower education.

In the emerging markets, organic food availability in retail outlets and price has been seen as the primary limiting factors for its consumption. In developed markets, common reasons for organic food purchases include also environmental concerns as well as health reasons. Qualitative appearance, such as taste and visual attractiveness, are significant determinants of the decision to buy organic food produce. In post socialist countries, Zakowska-Biemans (2011) findings point out that Polish organic food consumers have outlined the health, safety, lack of chemicals and quality as the main motivators for organic food purchases. The research findings from the ex-Yugoslavia area by Cerjak et al. (2010) have shown that the Croatian consumers have the most positive attitude towards organic food. The most important reasons for the consumption of organic products in Croatia and Slovenia are the health value and environmental concerns, while consumers in Bosnia and Herzegovina singled out the return to nature, the health value and the safety of organic food products. The research findings of Kuhar and Juvančič (2010) reveal that the most common reasons, for Slovenian consumers, are the availability in retail outlets, income, health and environmental considerations, and visual attractiveness of products. The Croatian consumers, in the findings of Brčić-Stipčević and Petljak (2011), perceive

organic food, as well as products with an eco-label, as tastier than conventional food, and consider them to be healthier for them and their families.

One of the first papers regarding the consumption of organic products by Jolly (1991) concludes that certain variables (age, occupation and size of residence) proved to be statistically significant to explain differences in purchasing behavior between consumers and non-consumers of organic products. Men have shown a greater WTP for organic products than women, while consumers with higher education show a greater WTP for organic products. Respondents aged forty to fifty showed a WTP to pay the highest premium for organic products (40.4%). Ott (1990) has analyzed the impact of socio-demographic characteristics on the consumption of organic products in the United States (South Atlanta). Two-thirds of respondents had a WTP of 5% to 10% for certified fresh products without pesticides, but did not want to accept any “cosmetic defects” (differences in taste, appearance) or insect damage. Misra et al. (1991) have identified that socio-demographic variables, such as race, age, income, and education, have a significant impact on the WTP for organic products. The consumer attitudes towards product testing and certification in the future can also influence the WTP. In addition, the findings of their research showed that respondents who were over 60 and whose annual total household income was more than \$35,000 were willing to pay the highest premium for certified pesticide-free products.

As far as the emerging markets of organic production, such as the Republic of Serbia, is concerned, through the last years there is a more positive attitude towards organic products (Vehapi, 2015; Vapa Tankosić et al., 2018; Vapa Tankosić and Hanić, 2019; Ćirić et al., 2020). But, the low purchasing power of consumers and high retail prices are the primary obstacles for higher consumption. Yet, the WTP for organic products in Serbia (Kranjac et al., 2017; Vapa Tankosić et al., 2018; Vapa Tankosić and Hanić, 2019; Vapa Tankosić et al., 2020) has shown that Serbian consumers would be willing to pay a premium up to 20% for organic products. Authors Vlahović et al. (2011) also state that the largest number of consumers think that organic products are safer for human consumption, while on the second place respondents have outlined its’ quality. A smaller number of consumers (10%) have mentioned the issue of environmental protection (prevalently respondents under 35 years of age). The findings on organic products consumers by Sekovska et al. (2012) has revealed that the majority of respondents in Macedonia and Serbia consider these products to be healthier, more natural, to have better quality and do represent a threat to the environment. On the other hand, the consumers do not believe that the organic products had a better taste, longer shelf life or better appearance. The research involving cities in Serbia by Vehapi (2015) indicates that most consumers (81.6%) have singled out their health as the main reason for the consumption of organic products in Serbia, then quality (25.9%) and food safety (23%). The consumers’ motives show that care for the animal welfare, saving resources for next generations and supporting local farmers are less important reasons. In times of Covid 19 there is an increased consumer concern for their health, reflected in an increased online shopping for organic produce, due to the fear of the Covid-19 (Ćirić et al., 2020).

## Materials and methods

Research has been performed in the Republic of Serbia from May 2021 to January 2022. The representative sample was chosen by the random selection method. The questionnaire has encompassed questions on the socio-demographic characteristics of consumers (gender, age, level of education, size of household, level of income, place of living), the frequency of the organic products purchase, the consumers' WTP for organic products (nothing more, up to 10%, 10-20%, 20-30% and more than 30%), the assessment of the organic products nutritional value (1-5) in regard to conventional products, place of purchase of organic product, for whom the organic products are purchased, healthy eating habits, impact of opinions of others on the organic products purchase, the type of organic products purchased and the main reasons and barriers for the consumption of the organic products. The answers received have included 433 respondents that are the consumers of organic products. The first hypothesis that the authors wanted to examine is whether the consumers' socio-demographic characteristics is correlated with the WTP for organic products and the assessment of the organic products nutritional properties. The second hypothesis that the authors wanted to test is whether the consumers' socio-demographic characteristics predict the WTP for organic products (Model 1) and their assessment of the organic products nutritional properties (Model 2). In case when the dependent variable is of the ordinal type, then we observe the events in relation to several categories, and the final cumulative model can be defined by the equation (1):

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

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.

In applying the models with proportional odds all the assumptions of validity of ordinal regressions have been verified. Model Fitting, Goodness-of-Fit (Pearson and Deviance Goodness-of-fit tests); Cox and Snell, Nagelkerke and McFadden  $R^2$ , as well as the assumption of parallel lines, have all been performed in order to prove the ordinal model validity. The statistical software package SPSS has been utilized for data analysis.

## Results and discussion

Our sample of 433 consumers of organic food products consisted of both male (47.8%) and female (52.2%) consumers. The majority of consumers are of the age between 40 and 50 (33.5%), followed by the age group of 30-40 (26.1%), 20-30 (21.9%), 50-60 (12.5%),

and the least represented consumers are of the age up to 20 (0.2%) and over 60 (5.8%). The majority of the respondents had finished high school (40.6%), had a bachelor degree (35.6%) followed by a master and PhD degree (23.8%). The majority of the respondents lived in a small household comprising 4 members (73.2%) and in the urban areas (80.6%). The majority of the respondents had an average monthly income between €500.00 and €1,000.00 (43.9%) followed by monthly earnings between €200 to 500 (33.7%), €1000-2000 (15.5%), more than €2000 (3.7%), and less than €200 (3.2%).

The largest percentage of consumers buy organic vegetables (34.4%) and fresh fruits (24%), followed by organic meat, grains and dairy produce (15.9%, 14.3% and 11.3%, respectively). Only a few respondents (8.5%) purchase organic food products every day. The answers show that the largest percentage of respondents buys organic products several times a month (43.6%), once a week (35.1%), followed by once in three months (9.9%), once in half a year (1.4%) or once in a year (1.4%). The largest number of respondents (28.4%) has a WTP for organic produce of 20-30% on the price of conventional products. In second place are respondents (26.3%) who are willing to pay 10-20% onto the standard price of products of conventional origin. In third place are respondents (21.5%) who are willing to pay more than 30%. In fourth place are respondents (16.6%) who are willing to pay a margin of 0-10%. Only a few consumers (7.2%) are not willing to pay anything more on the price of conventional products. The next variable refers to the expressed attitudes of the respondents on the assessment of the nutritional properties of the organic food products. The findings indicate that the majority of respondents (39.7%) have rated the nutritional properties with a grade 4 in regard to nutritional properties of conventional products on a scale from 0-5, followed by grade 5 (29.3%), grade 3 (22.9%), grade 2 (4.4%) and grade 1 (3.7%).

The main reasons for buying organic products: less “chemistry” (28.6%), child health care (26.8%), tastier and of better quality (16.9%), health (14.5%), and out of curiosity (6.7%). The consumers buy organic products in mainly in large supermarkets (37.05%), in specialized stores (21.2%), markets (21.9%), directly from organic producers (13.6%) or even they produce it (6.2%). The consumers are primarily buying organic food produce for the whole family (48.7%), for a member for the family (29.3%), for themselves (17.8%) or the products are bought by a family member for them (4.2%). The decision on the purchase is made by themselves (52.4%), or they are influenced by the media (20.6%), family (13.4%), friends (5.5%), doctors (4.6%), or other source (3.5%). The majority of respondents who consider themselves as not having healthy eating habits (55.2%), not completely having healthy eating habits (27.7%) and having only healthy eating habits (17.1%). High environmental awareness (5.8%) and the animal welfare (0.7%) as a general purchasing determinant do not have any motivating power, which indicates a low level of awareness of the above mentioned reasons. The main obstacles to buying organic products are: the price is too high (27.3%), no advantage over conventional products (24%), trust in organic certification (15.9%), not having enough knowledge and experience (9.9%), no formed habit (7.4%), no organic points of sale are found nearby (5.3%), insufficiently developed distribution channels

(4.4%), poor quantity of the organic offer (2.8%), less attractive appearance (2.1%) and regularity in the offer (0.9%).

From the descriptive statistics we can conclude that the consumers have shown a WTP for organic products of 20-30% on the price of conventional products and have attributed the grade 4 to organic products' nutritional properties are the female consumers that are in the age group 40-50, with finished high school, living in a small households with up to 4 members, whose monthly incomes range from €501,00 to €1.000,00.

The first hypothesis that the authors wanted to examine is whether the consumers' socio-demographic characteristics is correlated with the WTP for organic products and the assessment of the organic products nutritional properties. The consumers have been further segmented regarding the regularity of consumption of organic products for the aim of further analysis (Table 1). On the sample of regular consumers, the explanatory power of the model was tested, while on the sample of irregular consumers, the probabilistic power of the model was tested in order to determine the factors influencing irregular consumers to move from the group of irregular consumers to regular.

**Table 1.** Regularity of consumption of organic products

“How often do you buy organic products?”	Frequency	%	Regularity of consumption of organic products	Frequency	%
Every day	37	8.5	Regular consumers (1)	189	43.6
Once a week	152	35.1			
Several times in a month	189	43.6	Irregular consumers (2)	244	56.4
Once every three months	43	9.9			
Once in half a year	6	1.4			
Once in a year	6	1.4			
<b>Total</b>	<b>433</b>	<b>100.0</b>	<b>Total</b>	<b>433</b>	<b>100.0</b>

*Source:* author's own elaboration

The Pearson's Chi-square statistics in Table 2, between the observed variables, age and the WTP for the organic food products, in the group of regular consumers, is of corresponding significance (Asimp. Sig. = 0.04) therefore we can conclude that we do have enough reason to claim that the age and the WTP for the organic food products of the regular consumers are,  $\chi^2(16, n=189) = 27,014$ , interdependent variables. The relationship between the income and the WTP for the organic food products of the irregular consumers, based on Pearson's Chi-square statistics, is of corresponding significance (Asimp. Sig. = 0.03) and we can conclude that we do have enough reason to claim that the income and the WTP of the irregular consumers,  $\chi^2(16, n=244) = 28,089$ , are interdependent variables. The relationship between the place of living and the WTP for the organic food products of the irregular consumers, based on Pearson's Chi-square statistics is significant (Asimp. Sig. = 0.04) and we can conclude that we do have enough reason to claim that the place of living and WTP of irregular consumers are,  $\chi^2(4, n=244) = 9,915$ , interdependent variables.

**Table 2.** The level of significance of socio-demographic characteristics of regular and irregular consumers of organic products and WTP for organic food

	<b>WTP for organic food</b>	
Regular consumers	Age	.041
Irregular consumers	Income	.031
	Place of living	.042

*Source:* Authors' calculations

In order to further verify the relationship between the income and the assessment of the nutritional properties of organic products in the group of irregular consumers based on Pearson's Chi-square statistics and the corresponding significance (Asimp. Sig. = 0.03), we do have enough reason to claim that the following variables in the group of irregular consumers are  $\chi^2$  (16, n = 244) = 28,650, interdependent variables.

The Pearson's Chi-square statistics in Table 3, between the observed variables, the place of living and the assessment of the nutritional properties of organic products, in the group of regular consumers is of corresponding significance (Asimp. Sig. = 0.03) and we can conclude that we do have enough reason to claim that these variables are,  $\chi^2$  (4, n=189) = 11,076, interdependent variables.

**Table 3.** The level of significance of socio-demographic characteristics of regular and irregular consumers of organic products and assessment of the nutritional properties of organic products

	<b>Assessment of the nutritional properties of organic products</b>	
<b>Regular consumers</b>	Place of living	.02
<b>Irregular consumers</b>	Income	.02

*Source:* Authors' calculations

The second hypothesis that the authors wanted to test is whether the consumers' socio-demographic characteristics predict the WTP for organic products and consumers' assessment of the organic products nutritional properties. By using the ordinal logistic regression with the logit link function the influence of independent predictors (gender, age, education level, household size, place of residence and monthly income) on the WTP for organic products, as a dependent variable has been analyzed (Model 1). Before interpreting the model's regression coefficients, the assumptions regarding model adequacy have been examined. After the first testing of the model on the total sample of organic consumers, the ordinal regression parameters did not prove to be significant. The subsequent testing of the model was done by splitting the sample into groups based on regularity of consumption. First of all, in order to confirm that multicollinearity was not present in the model it was tested using VIF. Based on the results obtained

from the Model Fitting ( $\chi^2(4)= 13,105$ ;  $p= 0.01$ ) it can be concluded that the statistical significance of the models is present, in a sample of irregular consumers of organic products, and that the model with predictor variables makes a significant contribution to the prediction of the dependent variable (consumers' WTP for organic products). The value of the coefficient of determination (Nagelkerke Pseudo R<sup>2</sup>) has indicated 8.9% of the variance of the model was explained by the independent variables. The model further proved to be significant as the Goodness-of-Fit test proved the null hypothesis that the fit is good. As this hypothesis has not been rejected ( $p>0.05$ ) it has been concluded that the data and the model predictions are similar and that the model is good ( $\chi^2(12) =16.859$ ;  $p=0.15$ ). In addition to the results of assumptions regarding the model adequacy, a test of parallel lines has been performed. The assumption of proportional odds was confirmed by the result ( $\chi^2 =18,634$ ,  $df= 12$ ,  $p=0.98$ ). The process of verifying the adequacy of the Model 1 has been fully completed.

**Table 4.** Parameter Estimates of the Model 1

Parameter Estimates								
	Estimate	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval	
							Lower Bound	Upper Bound
up to 200 euros	-2,302	1,067	4,656	1	,031	<b>,100</b>	-4,394	-,211
201-500 euros	-2,265	,945	5,740	1	,017	<b>,104</b>	-4,117	-,412
500-1000 euros	-1,913	,934	4,199	1	,040	<b>,148</b>	-3,743	-,083
1000-2000 euros	-1,232	,971	1,610	1	,205	,292	-3,136	,671
more than 2000 euros	0 <sup>a</sup>	.	.	0	.	1,000	.	.

Link function: logit

a) This parameter is set to zero because it is redundant.

*Source:* Authors' calculations

The results of the final model obtained by ordinal regression (Table 4) have shown the statistical significance of only one independent variable, i.e. Income (category: up to 200 euros; 201-500 and 500-1000 euros), of the irregular consumers of organic products, which proved to be a significant predictor of the WTP for organic products (Sig. 0.03; 0.01 and 0.04 respectively). Based on the Exp (B) value for the explanatory variable Total monthly income, we can say that the probability of willingness of the consumers, who have a monthly income up to 200 euros; 201-500 and 500-1000 euros, to pay a higher price for the purchase of the organic products decreases by 0.10, 0.10 and 0.14 respectively, compared to those respondents that have an income of more than 2000 euros, controlling all other factors in the model. The following findings that the monthly income as socio-demographic characteristics, has a significant impact on the



likelihood that consumers will be willing to pay higher amount for organic products were confirmed by the findings in the USA (Jolly, 1991; Misra et al., 1991), Denmark (Millock et al., 2004), Greece (Tsakiridou et al., 2006), Great Britain and Denmark (Wier et al., 2008), Turkey (Akgungor et al., 2010), Iran (Haghjou et al., 2013), Slovakia and the Czech Republic (Zámková & Prokop, 2014), the United Arab Emirates (Muhammad et al., 2015), Croatia (Anić et al., 2015) and Thailand (Sriwaranun et al., 2015). The higher monthly household income positively influences the WTP for organic produce in Serbia (Vapa Tankosić et al., 2020).

Subsequently the authors have investigated whether the socio-demographic characteristics of consumers' predict the consumers' assessment of the nutritional properties of organic products (Model 2). After the initial testing of the model on the total sample of organic consumers, the ordinal regression parameters did not prove to be significant. The procedure was then repeated by splitting the sample into groups based on the regularity of consumption and subsequent testing of the model was done. The multicollinearity was tested and confirmed not to be present in the model. The Model Fitting provided us with information on whether the model with predictor variable can be marked as satisfactory. Based on the obtained fitting results ( $\chi^2(2) = 5,743$ ;  $p = 0.05$ ), the model further proved to be significant, on the sample of irregular organic consumers, as the Goodness-of-Fit test proved that the fit is good. Nagelkerke's Pseudo-R<sup>2</sup> has indicated a satisfactory value of the variance of the model. As this hypothesis has not been rejected ( $p > .05$ ) it has been concluded that the model is good ( $\chi^2(6) = 6,355$ ;  $p = 0.38$ ). The test of parallel lines has been performed. The assumption of proportional odds has been confirmed ( $\chi^2 = 6,406$ ,  $df = 6$ ,  $p = 0.98$ ).

**Table 5.** Parameter Estimates of the Model 2

Parameter Estimates								
	Estimate	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval	
							Lower Bound	Upper Bound
Small (1-4)	,938	,408	5,294	1	,021	<b>2,555</b>	,139	1,737
Middle (4-6)	,562	,445	1,598	1	,206	1,754	-,309	1,433
Big (over 6)	0 <sup>a</sup>	.	.	0	.	1,000	.	.

Link function: logit

a) This parameter is set to zero because it is redundant.

*Source:* Authors' calculations

The results of the final model obtained (Table 5) have shown the statistical significance of only one independent variable, i.e. Household size (category: Small 1-4) proved to be a significant predictor (Sig. 0.02). This indicated that the probability of the irregular consumers of organic products who live in a small household to assess the organic products nutritional properties with a higher grade increases by 2.55, compared to

those respondents who live in a big household (more than over 6 household members), controlling all other factors in the model. As small households have a possibility of a more frequent organic food, in regard to larger households' tight monthly budget, and usually live in urban areas where they are further away from nature they can view these products as healthier than products from conventional production. Loureiro et al. (2001) findings confirm that the presence of children under the age of eighteen in the household increases the likelihood of consuming organic products, while the size of the household negatively affects consumption.

### **Conclusion**

The market of consumers of organic food products in times of COVID-19 pandemic is dominated by females, the population between the ages of 40-50, with high school diploma, household size of up to four members, with monthly household income of 500 to 1,000 euros living in the city. The consumers buy organic food products for the whole family. Only a small number of respondents buy organic products every day and the majority of consumers buy organic products several times a month. Regarding the type of organic products that consumers most often buy, the majority of respondents buy organic vegetables and fresh fruits, while the purchase of organic products takes place mostly in larger supermarkets. From the findings we can conclude that food safety ("less chemistry") and child health are the main motives for consuming organic products.

Our findings point out that the majority of consumers in times of COVID-19 pandemic have a very positive attitude towards nutritional values of organic products, in relation to the conventional products. The main reason for insufficient consumption is primarily, and still, the high price. The findings also show that the consumers have expressed the WTP of 20–30% for the organic food products, relative to the price of conventionally produced products. Having in mind that in the sample of irregular consumers, the probabilistic power of the model was tested in order to determine the factors influencing irregular consumers to move from the group of irregular consumers to regular, the findings have shown that the monthly income determines the WTP which is reflected primarily in the low purchasing power in the Republic of Serbia thus preventing the irregular organic produce consumers to become regular consumers. The household size (small 1-4) has predicted the irregular consumers' assessment of the organic products nutritional properties which can relate to their potential higher assessment of nutritional properties which is due to more frequent consumption of organic purchase, compared to larger household which have more expenses and lower monthly budget for the purchase of organic food produce. As the organic market in our country gradually expands the knowledge and awareness of better informed and educated consumers can represent the potential for further growth of consumption of these products, even though insufficient consumer confidence is still present (albeit to a lesser extent than in the previous years). The socio-demographic variables can give further insight into a profile of organic consumers and the success in this market depends on marketing efficiency and targeted marketing strategies for this niche market, especially in times of COVID-19 pandemic.

## Conflict of interests

The authors declare no conflict of interest.

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