

“Decision-making process of tomatoes purchase by generation Z: case study in the Slovak Republic”

AUTHORS

Michaela Šugrova  <https://orcid.org/0000-0003-3052-1301>
Marek Plachy  <https://orcid.org/0000-0001-7457-4451>
Ľudmila Nagyova  <https://orcid.org/0000-0002-5220-2857>
 <https://www.webofscience.com/wos/author/record/I-8152-2018>
Jozef Šumichrast  <https://orcid.org/0000-0002-9026-1110>

ARTICLE INFO

Michaela Šugrova, Marek Plachy, Ľudmila Nagyova and Jozef Šumichrast (2020). Decision-making process of tomatoes purchase by generation Z: case study in the Slovak Republic. *Innovative Marketing* , 16(1), 66-78. doi:[10.21511/im.16\(1\).2020.07](https://doi.org/10.21511/im.16(1).2020.07)

DOI [http://dx.doi.org/10.21511/im.16\(1\).2020.07](http://dx.doi.org/10.21511/im.16(1).2020.07)

RELEASED ON Tuesday, 03 March 2020

RECEIVED ON Monday, 06 January 2020

ACCEPTED ON Wednesday, 26 February 2020

LICENSE



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

JOURNAL

"Innovative Marketing "

ISSN PRINT

1814-2427

ISSN ONLINE

1816-6326

PUBLISHER

LLC “Consulting Publishing Company “Business Perspectives”

FOUNDER

LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

32



NUMBER OF FIGURES

7



NUMBER OF TABLES

4

© The author(s) 2025. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 6th of January, 2020
Accepted on: 26th of February, 2020
Published on: 3rd of March, 2020

© Michaela Šugrová,
Marek Plachý, Ludmila Nagyová, Jozef
Šumichrast, 2020

Michaela Šugrová, Ph.D., Ing., Faculty
of Economics and Management,
Department of Marketing and Trade,
Slovak University of Agriculture in
Nitra, Slovak Republic. (Corresponding
author)

Marek Plachý, Ph.D. Student, Ing.,
Faculty of Economics and Management,
Department of Marketing and Trade,
Slovak University of Agriculture in
Nitra, Slovak Republic.

Ludmila Nagyová, Ph.D., Professor,
Ing., Faculty of Economics and
Management, Department of
Marketing and Trade, Slovak University
of Agriculture in Nitra, Slovak
Republic.

Jozef Šumichrast, Ph.D., Director,
Ing., Regional Agriculture and Food
Chamber in Trnava, Slovak Republic.



This is an Open Access article,
distributed under the terms of the
[Creative Commons Attribution 4.0
International license](https://creativecommons.org/licenses/by/4.0/), which permits
unrestricted re-use, distribution, and
reproduction in any medium, provided
the original work is properly cited.

Conflict of interest statement:
Author(s) reported no conflict of interest

Michaela Šugrová (Slovak Republic), Marek Plachý (Slovak Republic),
Ludmila Nagyová (Slovak Republic), Jozef Šumichrast (Slovak Republic)

DECISION-MAKING PROCESS OF TOMATOES PURCHASE BY GENERATION Z: CASE STUDY IN THE SLOVAK REPUBLIC

Abstract

The paper aims to investigate and assess the decision-making process of young Slovak consumers – generation Z – in the purchase of tomatoes.

The respondents participated in a questionnaire survey and blind testing of four tomato samples (two samples were Slovak and another two were foreign tomatoes). For a deeper analysis of the collected data, five scientific hypotheses were formulated. The accuracy of provided hypotheses was verified using the following mathematical-statistical methods: Chi-Square test of independence, Mann-Whitney U-test, and as Chi test for equality of proportions between two samples. The research results show that generation Z buys tomatoes once a week or several times a month. Moreover, it was found out that most young consumers are mostly influenced by freshness, taste, quality of tomatoes, and general appearance, the least by packaging, brand/specific tomato grower, information on the packaging and references. According to all observed attributes within the blind testing of tomato by the respondents, the best-evaluated sample was the Slovak sample of tomatoes – the sample B. Subsequently, all respondents were provided with information about the tested tomatoes, and it can be stated that they would also actually buy Slovak sample B in the store. Finally, one can state that the higher price of this sample has no significant impact on the respondents of generation Z.

Keywords

young generation, vegetables, consumer behavior,
purchase habits, consumers preferences, impact factors
of purchase, country of origin, questionnaire survey,
blind testing

JEL Classification

M31, Q13

INTRODUCTION

Nowadays, food market is generally influenced by new modern dietary trends in the context of healthy eating, animal welfare, ethical and sustainable consumption (Šedík, Šugrová, Horská, & Nagyová, 2017). Consumers are increasingly aware of the strong relationship between health and the need for a balanced diet. Safe foods are healthy, nutritious, and environmentally friendly due to ecological, sustainable, and clean production (B. Zhang, Fu, Huang, Wang, Xu, & L. Zhang, 2018). Kádeková, Récky, Nagyová, Košičiarová, and Holienčinová (2017) state that people are entirely aware of the importance of a healthy lifestyle. According to Perez-Cueto et al. (2017), achieving a sustainable and healthy diet is a major social interest, and it is a daily matter for consumers. At the same time, healthy eating can be sustainable because it has a balanced diet rich in the food of vegetable origin (vegetables, fruits, legumes beans).

With the arrival of globalization in grocery stores, the traveling distance of food has increased significantly. Although this allows for the nearly continuous availability of a wide range of foods, regardless of seasonal conditions, consumers are increasingly concerned about

transparency and food safety because they cannot understand the complex dynamics of the current food chains. In addition to these concerns, the last sequence of food scandals has threatened the credibility of the global food market (Meyerding, Trajer, & Lehberger, 2019).

In the last years in the Slovak Republic, tomatoes were consumed the most from all kinds of vegetables. Therefore, this paper is dealing with tomatoes. The authors decided to focus on a specific generation of consumers and chose the generation Z to investigate their purchasing and decision-making process on the Slovak tomato market. Similar research in the Slovak Republic has not been carried out. It was important to examine the consumer's attitudes in the context of the consumption of tomatoes as the most consumed vegetable.

Consumers' behavior in the Slovak vegetable market has generally been reviewed in the framework of the authors' previous research.

1. LITERATURE REVIEW

1.1. Consumers and vegetables purchase

The variety of fruits and vegetables in today's supermarkets is huge. Diversity across species has also increased considerably, with differences in size, shape, color, taste, production, and in the way of trading. Given the increased variability available to consumers, many of the product varieties offered are probably unknowable to the naive consumer, leading to uncertainty as to what qualities and taste experiences they expect (Schifferstein, Wehrle, & Carbon, 2019).

Ariyawardana, Ganegodage, and Mortlock (2017) state that fresh and processed vegetables will reach consumers only after they have passed through supply-customer chains, which may consist of manufacturers and importers, processors, wholesalers, and retailers. Although fresh produce chains are less complicated, the processed vegetable chains are becoming increasingly complex as the products can come from several countries or be repackaged.

Šugrová and Šumichrast (2018) report that in today's strong competitive environment, it is essential for both vegetable growers and business operators to understand the consumers, their needs, purchasing habits, preferences, and identify those factors that significantly affect their purchasing decision-making process in the vegetable market. The authors add that each consumer has individual preferences because he/she has the choice of an increasingly wide range of vegetables, which is significantly influenced by imports of vegetables.

According to Poyearleng, Kai, Shahriar, and Reakine (2019), consumer purchase intention would be different if consumers had a different level of knowledge. Consumers need to know what they buy to meet their needs and wishes. Food knowledge is an important factor that can affect consumer behavior in which knowledge is cognitive learning.

1.2. Vegetables/tomatoes consumption and production

Tomatonews.com (2019) state that the annual production of tomatoes is around 160 million tons worldwide. In contrast, three times more potatoes and six times more rice are grown worldwide. However, about a quarter of these 160 million tons are grown for the processing industry, making tomatoes the world's most important vegetable for processing. In the Slovak Republic, according to Bindics (2019), 60 thousand tons of tomatoes are consumed annually. Their share of the total vegetable consumption is 16.8%, and the onion is the most grown vegetable. An average of 34.2% of vegetables is grown in home gardens, which means that about 20 thousand tons of tomatoes are grown homely, and 40 thousand tons remain to professional domestic and foreign farms. In terms of fresh tomatoes within the EU, in 2017, their consumption per capita was 15 kilograms per year; the same is the prediction by 2025 (Tomatonews.com, 2017). In the Slovak Republic, in this year, fresh tomato consumption was 17.7 kg per capita (Meravá, 2018).

According to Salehi et al. (2019), the most important beneficial property of tomatoes is their high

antioxidant effects. These are mainly attributed to the presence of lycopene and other antioxidant vitamins, such as A and C, in their composition.

Menozzi, Sogari, and Mora (2017) report that older people more often consume vegetables daily, while the consumption of vegetables is lowest among young people aged 15-24. Rekhya and McConchie (2014) state that daily vegetable intake worldwide remains well below the recommended WHO doses, despite the health benefits associated with eating vegetables. World Health Organization (2003) claims that the recommended daily dose of fruit and vegetables is 400 grams/person and day. According to Storey and Anderson (2018), it is recommended to consume at least three servings of vegetables every day. Food and Agriculture Organization of the United Nations and World Health Organization (2017) add that despite the extensive promotion of fruit and vegetable consumption, worldwide consumption per capita is estimated at 20 to 50% of the minimum daily level of 400 grams or five 80-grams portions per day.

1.3. Generation Z and their consumer behavior

Wood (2013) states that generation Z refers to those individuals born from the mid-1990s to 2000. Four trends characterize generation Z: focusing on innovations, and insistence on convenience, an underlying desire for security, and finally a tendency toward escapism. Schlossberg (2016) reports that generation Z is even more economical than millennials, but in a different way. Generation Z has higher expectations than generation of millennials. Youth hates the feeling of being disrespected. Millennials are more tolerant than teens. Generation Z does not have brand loyalty. Teens impact the way their parents spend more than millennials. Retailers should focus on generation Z rather than millennials because they are a "barometer." According to Priporas, Stylos, and Fotiadis (2017), generation Z will be the biggest challenge for marketing and as consequently for retail, as members of this generation behave differently from consumers and focus much more on innovation. Ozkan and Solmaz (2015), based on their research, state that generation Z is more modern; knowing what it wants and using smartphones is the most important part of their lives.

The main objective of this scientific paper is to investigate and evaluate the decision-making process of generation Z in the purchase of tomatoes in the Slovak Republic.

2. DATA AND METHODS

The secondary data needed to process the subject matter were obtained from available resources – scientific articles from online databases, electronic documents, and websites. Available data from online database the Slovak Research Institute of Agriculture and Food Economics were used too.

Primary data were obtained by conducting a questionnaire survey, as well as using a blind test method. The survey aimed to investigate the consumer behavior of the generation Z living in the Slovak Republic when buying tomatoes and to identify the factors that influence them the most when buying tomatoes. The survey was conducted at the Faculty of Economics and Management, Slovak University of Agriculture in Nitra. Three hundred and nineteen (319) respondents of generation Z representing the target group were tested from 19 to 29 March 2018. The questionnaire consisted of ten questions related to the subject matter (seven questions were closed, two open, and one scaling question), and eight closed socio-demographic issues through which the characteristics of the respondents could be obtained. After responding to the survey questions, blind testing of tomatoes followed.

Blind testing of tomatoes was attended by the same respondents and at the same time as the questionnaire survey (319 respondents). The blind test aimed to determine what their decision-making and behavior is before and after giving specific information (producer, country of origin, price, place where the sample can be purchased) concerning the tested tomato samples. Based on the tested attributes, it was also interesting to find out whether respondents could identify which samples are from domestic production and which are imported.

All responses were recorded in a form consisting of seven questions, of which six were closed and one question was semi-open. There were four samples of tomatoes (two Slovak samples of cherry tomatoes and two imported). Respondents

evaluated the color, shape, general appearance, taste, and aroma of all four tested samples. Survey participants had no information about the country of origin, the producer, the variety, the price of tomatoes, etc. The role of respondents was to select the tomato sample that they liked the most, according to the attribute. Subsequently, there was investigated which of the tested tomato samples in their opinion were imported. After that, respondents received complete information on all tested tomato samples. Finally, in the last question, respondents should have indicated which of the tested tomato samples they would actually buy from the shop based on the blind test, as well as the information provided. Besides, respondents also had to state the reason for the answer.

During the blind test, balanced block – Latin squares to distribute the samples of the tested tomatoes were used. This prevented the effect of better sample survival, which is tested first in order, thus preventing an artificial increase in the sample's score. Latin squares are one of the Complete Randomized Block Design (CRBD) systems. The first evaluator gets rank ABCD, second DCBA, third CADB (Williams Latin squares) (Němcová & Berčík, 2019).

There had to be described all the data obtained verbally and graphically. For a deeper analysis of the obtained data, there were formulated five scientific hypotheses:

- H1: Significant relationship between gender and tomato purchase frequency.*
- H2: Relationship between the place of residence and place of purchase.*
- H3: The proportion of women who know Slovak producers of tomatoes is not higher than the proportion of men.*
- H4: Most of the people who prefer just Slovak tomatoes would after blind test rather buy imported tomatoes, according to information about the price.*
- H5: There is a significant difference between the impact of factors on consumer's gender in the decision-making process of tomatoes purchase.*

The accuracy of formulated hypotheses was verified using the following mathematical-statistical methods:

- Chi-Square test of independence;
- Mann-Whitney U-test;
- Chi test for equality of proportions between two samples.

The data analyzed using Excel were interpreted verbally. Three hundred and nineteen (319) respondents from which 292 buy tomatoes at least rarely and others do not buy it at all participated in this survey. Table 1 shows the completed sample structure regarding socio-demographic data. According to socio-demographic data, the biggest group represents females (71.16%) with completed high school (74.29%), living with parents and siblings (57.68%) in the city (40.13%). Majority of them have monthly income less than 400 EUR (83.07%).

Table 1. Structure of the sample survey and blind test sample

Source: Authors (2019).

Gender	
Female	71.16%
Male	28.84%
Education	
High school	74.29%
Bachelor degree	22.88%
Master degree	2.82%
Place of residence	
City	40.13%
Countryside	59.87%
Structure of household	
Live with parents and siblings	57.68%
Live with parents	34.17%
Live with spouse or partner without children	4.39%
Live alone	3.76%
Monthly income	
Less than 400 €	83.07%
601-800 €	5.64%
401-600 €	5.33%
801-1000 €	3.76%
More than 1,000 €	2.19%
Age structure	
Generation Z	100.00%

Note: N = 319.

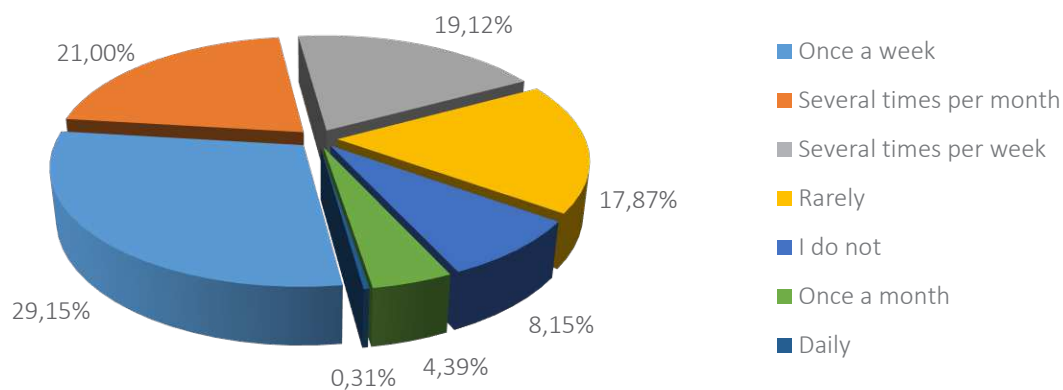


Figure 1. Frequency of tomato purchased by respondents

3. RESULTS AND DISCUSSION

As can be seen in the following figure (Figure 1), most of the respondents from generation Z buy tomatoes once a week (29.15%) or several times a month (21.00%). Only 0.31% of consumers buy tomatoes daily. There were collected 319 suitable answers for this question.

Dependence between the frequency of tomato purchases and gender (Figure 2) was point of interest too. There was formulated a hypothesis that there is significant relationship between gender and tomato purchase frequency. To confirm a hypothesis, Chi-Square test of independence with Excel function CHISQ.TEST was used. According to p -value ($0.287 > \alpha(0.05)$) this scientific hypothesis

was not confirmed, so there is not significant relationship between tomato purchase frequency and the gender in generation Z. According to Figure 2, it can be seen that most of young consumers buy tomatoes once a week (25.00% of male, 30.84% of female) and the least of them buy tomatoes daily (only 1.09% of male).

According to the findings, most respondents buy the cherry on stem type of tomatoes (34.80%), although this value is comparable to cherry berries/choppy (28.41%) and classical size of tomatoes (27.31%). Moreover, it can be claimed that 9.03% of respondents buy middle cocktail tomatoes (Figure 3). Respondents could answer with a multiple choice. There were collected answers from 291 suitable respondents and 454 choices of answers.

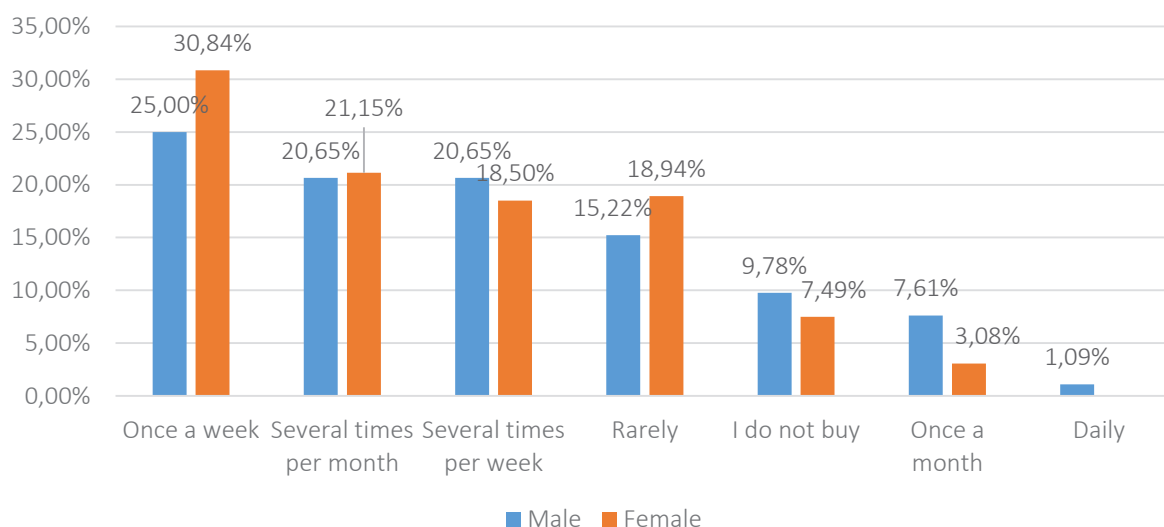


Figure 2. Frequency of tomato purchase according to gender by generation Z

Source: Authors (2019).

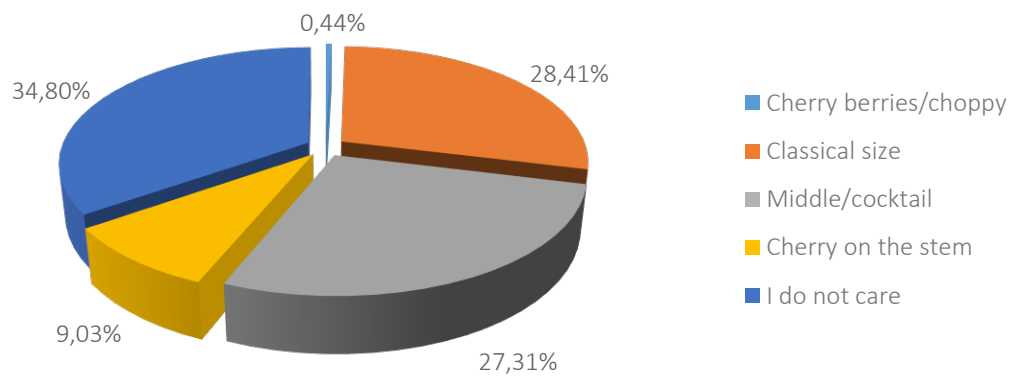


Figure 3. Types of most purchased tomato by generation Z

More than 79.00% of respondents buy tomatoes in supermarket/hypermarket and less than 8.00% buy it at the marketplace and at the farms, according to the research. Only 0.68% of them buy tomatoes at farm markets. Šugrová and Šumichrast (2018) confirm that currently consumers buy vegetables most often in supermarkets. As can be seen in Figure 4, there is more than 63.00% of respondents from the countryside who buy tomatoes in the supermarket/hypermarket. It is kind of paradox because most of the supermarkets are in the cities. And 60.00% of consumers who buy on wholesale are from the countryside as well (Figure 4). According to this information, scientific hypothesis whether there is relationship between the place of residence and place of purchase was in-

teresting. A hypothesis says that there is relationship because people from rural areas have more opportunities to shop from regional farm producers and yard sale. Therefore, the Chi-Square test of independence with Excel function CHISQ.TEST in Excel was used. But null hypothesis was denied according to p -value ($0.755 > \alpha(0.05)$). It follows that, according to the research, people from generation Z, regardless of the place of residence, buy mostly in supermarkets, so there is no significant relationship between the place of residence and place of purchase.

Respondents were asked if they know some Slovak producer of tomatoes. It can be concluded that 34.94% of male and 35.57% of female answered

Source: Authors (2019).

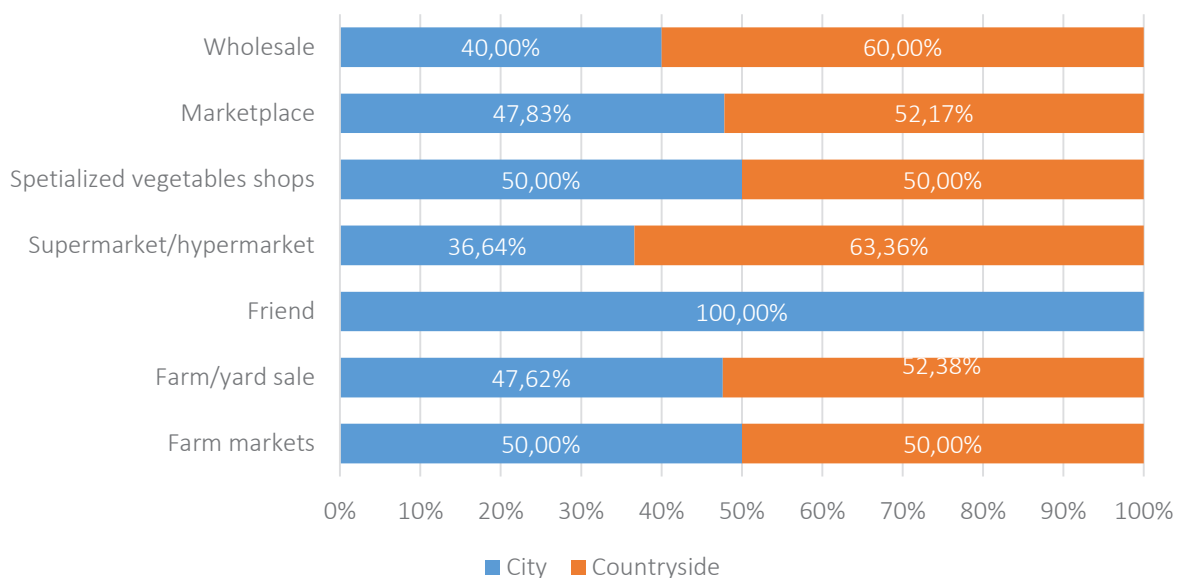


Figure 4. Place of residence and place of tomato purchase



Figure 5. Factors influencing generation Z decision-making process when buying tomatoes

that they know some tomato producer. This aroused interest in whether there is a significant difference in the proportion of males and females knowing the Slovak producers of tomatoes. Chi test for equality of proportions between two samples was used to test the hypothesis. The test shows that $U (0.578) < U_{tab} (1.645)$ with $\alpha (0.05)$, and, therefore, there is not a significant difference between those proportions. The hypothesis was confirmed. It means that the proportion of females who know Slovak producers of tomatoes is not higher than the proportion of males. There were collected 293 suitable answers to this question.

The following figure (Figure 5) demonstrates factors influencing generation Z decision-making process when buying tomatoes. Respondents on the 5-point scale rated 14 factors that impact them when buying tomatoes and ranging from 1 to 5 (1 = the maximum impact, 5 = no impact). Based on the research results, it can be stated that generation Z decision-making process when buying tomatoes is most influenced by freshness (1.28 points), taste (1.41 points), quality of tomatoes (1.50 points), and general appearance (1.61 points). The least by packaging (3.71 points), brand/specific tomato grower (3.55 points), information on the packaging (3.29 points) and references (3.29 points). The price (2.57 points) and country of origin (2.78

points) were rated by consumers that have an average impact on the purchase of tomatoes.

Meyerding (2016) found out that the price is the most important indicator in the selection process of tomatoes, followed by domestic origin. In their study, Manero et al. (2017) dealt with educational campaigns, as well as the impact of prices on the consumption of vegetables. The authors point out that costs have been recorded as an obstacle to adequate vegetable consumption. They also report that financial barriers can only be a minor contributor to inadequate vegetable consumption. Baselić, Calantuoni, Lass, Nardone, and Stasi (2017) state that in addition to comfort, preferences for direct consumption products are strongly related to the perception of food safety and packaging characteristics. Deliza, Rosenthal, and Silva (2003) found out that labeling and product information, nutrition information, information about safety, and production descriptions are important attributes when choosing food.

References of tomato purchases according to the country of origin, without tasting and pointing on the price of tomatoes, are revealed in the next figure (Figure 6) as well. According to it, most young consumers of tomatoes do not care about the country of origin (54.55%), and

Source: Authors (2019).

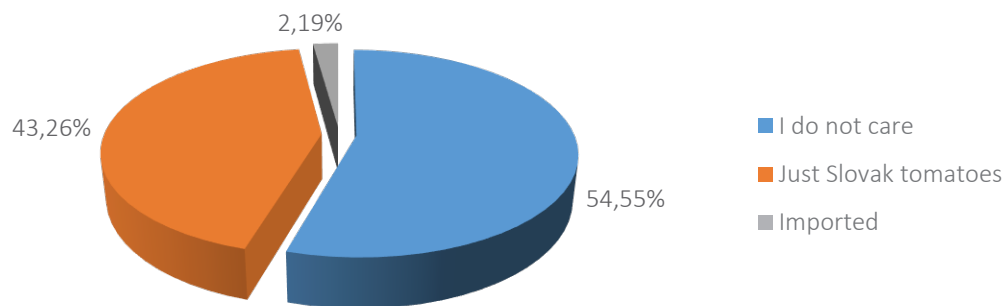


Figure 6. Preferences of tomatoes according to the country of origin by generation Z

43.26% of respondents answered that they prefer Slovak tomatoes. Figure 6 is created according to 319 suitable answers. Šugrová and Šumichrast (2018) found out that the respondents evaluate the country of origin as a factor that has an average impact on the vegetable purchase.

Four tomato samples were tested using a blind test as a next step. Samples were selected randomly, two Slovak samples and two imported samples (samples B and D were from Slovakia, and samples A and C were imported). Respondents tested each sample based on five attributes (general appearance, shape, color, smell, and taste). Their task was to choose one tomato sample, according to each test attribute. The tomatoes were always tested from sample A to sample D, with no sample information given to respondents in order not to influence them during testing.

As can be seen in the following table (Table 2), during the blind test, the Slovak sample B, except for the aroma, was best evaluated. According to the tomato aroma, the respondents evaluated the best Slovak sample D. Foreign samples A and C were worse than domestic tomatoes during the whole blind test.

Saba et al. (2018) have found in their research out that consumers perceive the freshness of vegetables, as well as tomatoes based on visual stimuli, followed by sensory stimuli/texture dimension. In particular, consumers used a visual incentive to indicate the freshness of tomatoes. In fact, the clear color of the product, as well as the stalks, contributed to the freshness concept, which confirms that consumers can judge the degree of freshness based on their color expectations. Schifferstein, Wehrle, and Carbon (2019) add that consumers use vegetable color as a guide to product identification, to assess the safety, quality, and maturity of a product. Based on these attributes, they conclude on the sensory properties of vegetables.

For many types of vegetables, people are familiar with color prototypes (for example orange for carrots, red for tomatoes, green for cucumbers), while colors make it easier to identify the class of products and thus encourage consumers to buy. Relatively subtle color differences (for example, several shades of a red tomato) can already have a significant impact on consumer expectations and food preferences. These color changes can be interpreted as meaningful information. They can be used, for example, as indicators of fresh-

Table 2. Results of blind test of tomatoes by respondents

Source: Authors (2019).

Sample/attribute	General appearance	Shape	Color	Aroma	Taste
Sample A	7.00%	11.80%	4.50%	5.80%	6.20%
Sample B	55.90%	45.40%	61.40%	33.00%	56.20%
Sample C	3.50%	13.10%	3.50%	26.60%	6.80%
Sample D	33.50%	32.30%	30.90%	35.60%	32.80%

Table 3. Change of preferences before and after finding out the price

Source: Authors (2019).

Which tomatoes would you really buy?	Preference after respondent found out the price				Total
Preference before respondent found out the price	Sample A (foreign)	Sample B (Slovak)	Sample C (foreign)	Sample D (Slovak)	
I do not care	12.35%	54.94%	9.26%	23.46%	100%
Just Slovak tomatoes	8.00%	65.60%	2.40%	24.00%	100%
Imported	0.00%	66.67%	16.67%	16.67%	100%

ness, maturity, or nutrient content (C. Crisosto, G. Crisosto, & Metheney, 2003; Leksrisompong, Whitson, Truong, & Drake, 2012).

Next point of interest was if respondents know which samples of tomatoes are Slovak and which are foreign. The majority of respondents could determine the origin of tomatoes correctly. Subsequently, the respondents had complete information about the tested tomato samples. Based on this information, the respondents would buy real samples of tomato B (59.90%) or sample D (23.10%). Only 7.10% of them would buy a foreign sample A, so it was concluded that generation Z does not decide on the purchase of tomatoes on a price basis. The price of tested tomato samples was as follows: foreign sample A: 2.38 Eur/kg, Slovak sample B: 9.96 Eur/kg, foreign sample C: 4.76 Eur/kg, and finally Slovak sample D: 9.96 Eur/kg.

In the Slovak Republic, it is a huge difference among tomatoes from foreign countries and tomatoes with Slovak origin. Slovak tomatoes are, in general, more expensive. Therefore, the preferences, according to the country of origin, without knowing the price and after respondents found out the price, were tested. It can be concluded that, according to Chi-Square test of independence (made from data in Table 3), there is no significant dependence among four tested tomato samples. The reason is that p -value (0.177) > α (0.05). It can be claimed that there is no dependence between preferences of tomato purchases according to price. As such, a hypothesis is not confirmed. In Table 3 it can be seen that in generation Z, just a few people care about the price of tomatoes. Just 10.40% of re-

spondents would change their opinion in a case they find out the real higher price of Slovak tomatoes than foreign tomatoes. Oppositely more than 80.00% of young consumers who firstly wanted to buy from import changed their opinions and wanted to buy rather a Slovak sample after finding out the price. Šugrová et al. (2018) state that the price of vegetables is rated by the respondents as a factor that has an average impact on the purchase of vegetables.

According to the research results, finding, if there is a statistically significant relationship between gender and factors, which affect the generation Z in purchases, was interesting. Question: "How much does this factor affect you in tomato purchase?" were given to respondents according to each factor (price, quality, country of origin, discount/sale, brand/specific grower, references, taste, general appearance, freshness, aroma, habit, price/weight ratio, packaging as well as information on packaging). There were collected 291-293 answers. From this number of respondents who answered a question about each factor, 91-92 were males and 199-201 females. Some respondents did not answer all the questions. Respondents could choose from 5-point scale value, where 1 (the maximum impact) and 5 (no impact). The only factor in which a significant difference of impact on gender in the consumers decision-making process was proved based on Mann-Whitney U-test is freshness (Figure 7). In this case, Z value is (1.723) > critical value (1.645). In other factors, there were not claimed statistically significant differences in the impact on the gender of consumers in the decision-making process. Results of all tested hypotheses are shown in Table 4.

Source: Authors (2019).

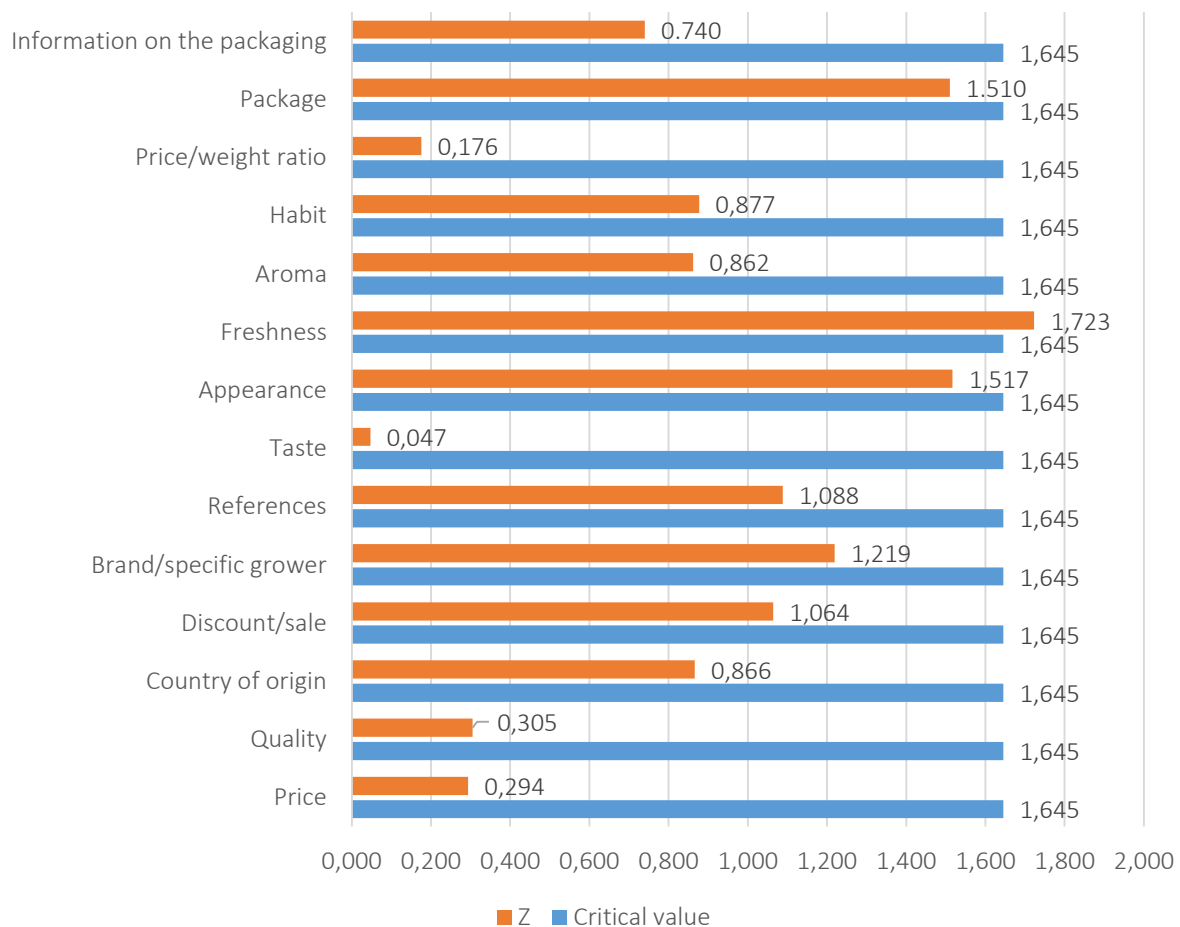


Figure 7. Mann-Whitney U test results according to each factor

Table 4. Summary of tested hypotheses

Source: Authors (2019).

Hypotheses	Test	P/U/Z value	Confirmed
Significant relationship between gender and tomato purchase frequency	Chi-Square test of independence	0.287	No
Relationship between the place of residence and place of purchase	Chi-Square test of Independence	0.755	No
The proportion of women who know Slovak producers of tomatoes is not higher than the proportion of men	Chi test for equality of proportions	0.578	Yes
Most of the people who prefer just Slovak tomatoes would after blind test rather buy imported tomatoes, according to information about the price	Chi-Square test of independence	0.177	No
There is a significant difference between the impact of factors on consumer's gender in the decision-making process of tomatoes purchase	Mann-Whitney U-test	More results	Only freshness claimed

CONCLUSION

This scientific study contributes to research about consumer behavior in the vegetable market. The target group were young consumers of tomatoes – the generation Z – in the Slovak Republic while focusing on their purchasing and decision-making process. This research was carried out via questionnaire survey and using blind test method. Findings show that most of the respondents from generation Z buy the cherry on stem type of tomatoes once a week in supermarket or hypermarket. Their decision-making

process is most influenced by freshness and the least by packaging of tomatoes. Research results point to the fact that generation Z do not care about the country of origin or prefer Slovak tomatoes.

According to blind test results, where respondents tested four tomato samples (2 Slovak tomato samples – B and D, as well as two imported tomato samples – A and C), it can be stated that the best-evaluated sample was Slovak sample B. During blind test of tomatoes, respondents had no information about the tested samples. After providing information on tested tomatoes (price, country of origin, etc.), most respondents chose the same sample.

Results of the statistical analysis show that there was not proven significant relationship between tomato purchase frequency and gender in generation Z. Also, it can be stated that there does not exist any relationship between the place of residence and place of tomato purchase. The proportion of women in generation Z who know Slovak producers of tomatoes is not higher than the proportion of men. The Slovak tomato producers are known in the minds of both males and females equally. Moreover, we found out that tomato freshness has a different impact on the decision-making process of purchases regarding gender.

An important finding was that generation Z is not price-sensitive concerning the purchase of tomatoes. Young consumers do not care about the country of origin when buying tomatoes, but after they have been tasted, they have definitely decided on Slovak tomatoes. Therefore, it is necessary to focus on the education of the young generation of consumers given the benefits of consuming Slovak vegetables in general compared to the imports, and this despite the large differences in prices between Slovak and imported vegetables.

Finally, the next research might be conducted for an in-depth study of other generations and their decision-making process in the tomato market, as well as the vegetable market in general, and, based on the future research results regarding demographic segmentation, to formulate precisely targeted marketing strategies of retailers.

ACKNOWLEDGMENT

The paper is a part of the research project VEGA 1/0502/17 “Consumer personality and its impact on emotional behaviour and decision making,” solved at the Department of Marketing and Trade, Faculty of Economics and Management, Slovak University of Agriculture in Nitra.

AUTHOR CONTRIBUTIONS:

Conceptualization: Michaela Šugrová, Marek Plachý, Ludmila Nagyová.

Data curation: Michaela Šugrová, Marek Plachý.

Formal analysis: Michaela Šugrová, Marek Plachý, Ludmila Nagyová.

Funding acquisition: Michaela Šugrová, Marek Plachý.

Investigation: Michaela Šugrová, Marek Plachý.

Methodology: Michaela Šugrová, Marek Plachý, Jozef Šumichrast.

Project administration: Michaela Šugrová, Marek Plachý, Ludmila Nagyová, Jozef Šumichrast.

Resources: Michaela Šugrová, Marek Plachý, Ludmila Nagyová.

Software: Michaela Šugrová, Marek Plachý.

Supervision: Michaela Šugrová, Marek Plachý, Jozef Šumichrast.

Validation: Michaela Šugrová, Marek Plachý, Ludmila Nagyová, Jozef Šumichrast.

Visualization: Michaela Šugrová, Marek Plachý.

Writing – original draft: Michaela Šugrová, Marek Plachý.

Writing – review & editing: Michaela Šugrová, Marek Plachý, Ludmila Nagyová.

REFERENCES

- Ariyawardana, A., Ganegodage, K., & Mortlock, M. Y. (2017). Consumers' trust in vegetable supply chain members and their behavioural responses: A study based in Queensland, Australia. *Food Control*, 73(0), 193-201. <https://doi.org/10.1016/j.foodcont.2016.08.006>
- Baselice, A., Calantuoni, F., Lass, D. A., Nardone, G., & Stasi, A. (2017). Trends in EU consumers' attitude towards fresh-cut fruit and vegetables. *Food Quality and Preference*, 59, 87-96. <https://doi.org/10.1016/j.foodqual.2017.01.008>
- Bindics, Z. (2019). Skleníky – nie všetko, čo sa blyští, je zlato. *Rolnícke noviny*, 90(8), 12.
- Crisosto, C. H., Crisosto, G. M., & Metheney, P. (2003). Consumer acceptance of 'Brooks' and 'Bing' cherries is mainly dependent on fruit SSC and visual skin colour. *Postharvest Biology and Technology*, 28(1), 159-167. [https://doi.org/10.1016/S0925-5214\(02\)00173-4](https://doi.org/10.1016/S0925-5214(02)00173-4)
- Deliza, R., Rosenthal, A., & Silva, A. L. S. (2003). Consumer attitude towards information on non-conventional technology. *Trends in Food Science & Technology*, 14(1-2), 43-49. [https://doi.org/10.1016/S0924-2244\(02\)00240-6](https://doi.org/10.1016/S0924-2244(02)00240-6)
- Food and Agriculture Organization of the United Nations and World Health Organization (2017). *Fruit and vegetables for health initiative*. Retrieved May 11, 2019 from <http://www.fao.org/3/a-i6807e.pdf>
- Kádeková, Z., Récky, R., Nagyová, L., Košičiarová, I., & Holienčinová, M. (2017). Consumers' Purchasing Preferences towards Organic Food in Slovakia. *Potravinárstvo Slovak Journal of Food Sciences*, 11(1), 731-738. <https://doi.org/10.5219/846>
- Leksrisompong, P. P., Whitson, M. E., Truong, V. D., & Drake, M. A. (2012). Sensory attributes and consumer acceptance of sweet potato cultivars with varying flesh colours. *Journal of Sensory Studies*, 27(1), 59-69. <https://doi.org/10.1111/j.1745-459X.2011.00367.x>
- Manero, J., Phillips, C., Ellison, B., Lee, S.-Y., Nickols-Richardson, S. M., & Chapman-Novakofski, K. M. (2017). Influence of seasoning on vegetable selection, liking and intent to purchase. *Appetite*, 116, 239-245. <https://doi.org/10.1016/j.appet.2017.04.035>
- Menozzi, D., Sogari, G., & Mora, C. (2017). Understanding and modelling vegetable consumption among young. *LWT – Food Science and Technology*, 85, 327-333. <https://doi.org/10.1016/j.lwt.2017.02.002>
- Meravá, E. (2018). *Zelenina – Situačná správa k 31.12.2017 a výhľad na rok 2018*. Retrieved May 11, 2019 from http://www.vuepp.sk/dokumenty/komodity/2018/Zelenina_18.pdf
- Meyerding, S. G. H. (2016). Consumer preferences for food labels on tomatoes in Germany – A comparison of a quasi-experiment and two stated preference approaches. *Appetite*, 103, 105-112. <https://doi.org/10.1016/j.appet.2016.03.025>
- Meyerding, S. G. H., Trajer, N., & Lehberger, M. (2019). What is local food? The case of consumer preferences for local food labeling of tomatoes in Germany. *Journal of Cleaner Production*, 207, 30-43. <https://doi.org/10.1016/j.jclepro.2018.09.224>
- Němcová, J., & Berčík, J. (2019). Neuromarketing and the decision-making process of the generation Y wine consumers in the Slovak Republic. *Potravinárstvo Slovak Journal of Food Sciences*, 13(1), 38-45. <https://doi.org/10.5219/1018>
- Ozkan, M., & Solmaz, B. (2015). Mobile Addiction of Generation Z and its effects on their Social Lives. *Procedia – Social and Behavioral Sciences*, 205, 92-98. <https://doi.org/10.1016/j.sbspro.2015.09.027>
- Perez-Cueto, F. J. A., Dos Santos, Q., Nielsen, B., Dinnella, C., Monteleone, E., Giboreau, A., Saulais, L., Depey, L., Hartwell, H., & Appleton, K. (2017). Danish adolescents like their vegetables fresh rather than frozen or canned. *International Journal of Gastronomy and Food Science*, 9, 29-33. <https://doi.org/10.1016/j.ijgfs.2017.05.003>
- Poyearleng, Ch., Kai, Z., Shahriar, S., & Reakine, O. P. S. (2019). Factors Influencing Consumers' Purchasing Behavior on Organic Vegetables: A Case Study in Vientiane, Lao PDR. *Open Journal of Social Sciences*, 7, 199-215. <https://doi.org/10.4236/jss.2019.72017>
- Priporas, C.-V., Stylos, N., & Fotiadis, A. K. (2017). Generation Z consumers' expectations of interactions in smart retailing: A future agenda. *Computers in Human Behavior*, 77, 374-381. <https://doi.org/10.1016/j.chb.2017.01.058>
- Rekhy, R., & McConchie, R. (2014). Promoting consumption of fruit and vegetables for better health. Have campaigns delivered on the goals? *Appetite*, 79, 113-123. <https://doi.org/10.1016/j.appet.2014.04.012>
- Saba, A., Moneta, E., Peparaio, M., Sinesio, F., Vassallo, M., & Paoletti, F. (2018). Towards a multi-dimensional concept of vegetable freshness from the consumer's perspective. *Food Quality and Preference*, 66, 1-12. <https://doi.org/10.1016/j.foodqual.2017.12.008>
- Salehi, B., Sharifi-Rad, R., Sharopov, F., Namiesnik, J., Rooiintan, A., Kamle, M., Kumar, P., Martins, N., & Sharifi-Rad, J. (2019). Beneficial effects and potential risks of tomato consumption for human health: An overview. *Nutrition*, 62, 201-208. <https://doi.org/10.1016/j.nut.2019.01.012>
- Schifferstein, H. N. J., Wehrle, T., & Carbon, C.-CH., (2019). Consumer expectations for vegetables with typical and atypical colours: The case of carrots. *Food Quality and Preference*, 72, 98-108. <https://doi.org/10.1016/j.foodqual.2018.10.002>
- Schlossberg, M. (2016). *Teen Generation Z is being called 'millennials on steroids,' and that could be terrifying for retailers*. Retrieved May 10, 2019 from <https://www.businessinsider.com/millennials-vs-gen-z-2016-2?r=UK>
- Šedík, P., Šugrová, M., Horská, E., & Nagyová, L. (2017). Comparative study on private label brand "K – take it veggie" in Slovakia and the Czech Republic. *Economics, Management, Innovation – Scientific-Technical Journal of Moravian Business Collage Olomouc*, 9(2), 59-71.
- Storey, M., & Anderson, P. (2018). Total fruit and vegetable consumption increases among consumers of frozen fruit and vegetables. *Nutrition*, 46, 115-121. <https://doi.org/10.1016/j.nut.2017.08.013>
- Šugrová, M., & Šumichrast, J. (2018). Zastavme prepád pestovania zeleniny! *Rolnícke noviny*, 89(8), 11.
- Šugrová, M., Nagyová, L., Tkáč, F., & Janšto, E. (2018). *Factors Influencing Slovak Consumer's Actual Buying*

- Behavior towards Fresh Vegetable*. Paper presented at the International Scientific Days 2018 (pp. 706-718). Slovak University of Agriculture in Nitra, May, 16-17, Nitra.
28. Tomatonews.com. (2017). *EU Agricultural Outlook for the EU Agricultural Markets and Income 2017-2030*. Retrieved May 11, 2019 from http://www.tomatonews.com/en/eu-agricultural-outlook_2_242.html
 29. Tomatonews.com. (2019). *The global tomato processing industry*. Retrieved May 11, 2019 from http://www.tomatonews.com/en/background_47.html
 30. Wood. (2013). *Generation Z as Consumers: Trends and Innovation*. Institute of Emerging Issues: NC State University. Retrieved May 10, 2019 from <https://iei.ncsu.edu/wp-content/uploads/2013/01/GenZConsumers.pdf>
 31. World Health Organization (2003). *Diet, nutrition and the prevention of chronic diseases: Report of a Joint WHO/FAO Expert Consultation*. Retrieved May 11, 2019 from https://apps.who.int/iris/bitstream/handle/10665/42665/WHO_TRS_916.pdf;jsessionid=F57DE06E1A2D862D8B6E8C3E7D14EE47?sequence=1
 32. Zhang, B., Fu, Z., Huang, J., Wang, J., Xu, S., & Zhang, L. (2018). Consumers' perceptions, purchase intention, and willingness to pay a premium price for safe vegetables: A case study of Beijing, China. *Journal of Cleaner Production*, 197, 1498-1507. <https://doi.org/10.1016/j.jclepro.2018.06.273>