# NUTRITIONAL BEHAVIOUR OF HOUSEHOLDS: AN ANALYSIS OF SLOVAK CONSUMERS

## PAVOL KITA, GRZEGORZ MACIEJEWSKI, MARTA ŽAMBOCHOVÁ, JÁN STRELINGER, VERONIKA KITOVÁ MAZALÁNOVÁ

**ABSTRACT**

The aim of the paper is to present the attitude of mothers to choosing healthy food for their children and other members of their households. The survey was conducted in the period of January-May 2019 on a sample of 1373 respondents from Slovakia. We were interested in discovering the extent to which households in which the mother has the decisive word differ from other households in terms of their food choices. The most relevant test for achieving the goal was a nonparametric, two-sample Mann-Whitney test. We also created regression decision trees with the help of a CRT algorithm. Furthermore, we were interested in determining the differences in four areas: firstly in terms of the content of consumed food; secondly in terms of eating healthy food; thirdly in terms of the frequency of eating special types of food; and finally the frequency of eating outside the home. The research results show that a mother's nutritional behaviour, knowledge, attitude and practice may significantly influence the behaviour of her relatives. Lifestyle changes can also provide an appropriate home-food environment in order to adopt healthy behavioural models. Mothers, as consumers, should also be supported by food manufacturers in making healthier food choices through supplying more complete and correct information about their products and creating educational programmes to strengthen their knowledge of cooking. These findings can be used by nutritional programmes to promote the purchasing of healthy food to Slovak consumers.

**KEY WORDS**

consumer behaviours, households, mothers, food choice, decision making, family food environment, decision trees, Slovakia.

**PAVOL KITA**
e-mail:pavol.kita@euba.sk
University of Economics
in Bratislava, Slovakia

**GRZEGORZ MACIEJEWSKI**
e-mail: grzegorz.maciejewski@
ue.katowice.pl
University of Economics
in Katowice, Poland

**MARTA ŽAMBOCHOVÁ**
e-mail: Marta.Zambochova@ujep.cz
J.E. Purkyne University in Usti
nad Labem, Czech Republic

**JÁN STRELINGER**
e-mail: jan.strelinger@euba.sk
University of Economics
in Bratislava, Slovakia

**VERONIKA KITOVÁ MAZALÁNOVÁ**
e-mail: veronika.mazalanova@uniba.sk
Comenius University
in Bratislava, Slovakia

## Introduction

Today´s society prioritises self-interested consumption. It is very difficult to be a conscious consumer in the world of consumption, especially as far as foodis concerned. Suffice to say that nearly 50% of consumers feel various kinds of concerns about purchasing food. Most often theseare associated with the possibility of food poisoning or adverse health effects (Maciejewski, 2012). Food choice can lead to an improvement incurrent and future health, mainly among adolescents (Contento et al., 2006).

Mothers can help adolescents with their food choices. In Slovakia, the mother'srole in feeding the family is unquestionable. The latest, as yet unpublished research conducted by Kita and Maciejewski in 2019 indicates that women most often prepare meals, shop for food and have an im-

pact on what is bought. In Slovakia, 70.3% of women buy food for their households, and in Poland 81.4% of women do so (the results of this research will be published more widely). A mother's knowledge, attitude and practice can significantly influence relatives. Lifestyle changes can also provide a suitable family background to encourage children to adopt healthy behavioural models (Bakosova and Baska, 2003). According to many authors, e.g. Wellman and Johnson (1982), Rozin (1990), and Maciejewski et al., (2020), eatingcan be characterised as a complex process by which a substance that has been deemed edible is consumed for the purpose of not only securing nutrients to meet physiological requirements in maintaining and sustaining life, but in fulfilling psychological and emotional desires.

However, it is now clear and proven that diet has a significant impact on health and improving the health of the population through BMI, which is used to assess the prevalence of obesity (BMI$> 25$ kg/m$^2$). The BMI index for Slovakia in 2008 was 27.01 kg/m$^2$ (Douillard and de Vos, 2019). It has been observed that, according to cardiac surgery statistics in 2012 on a sample of 1305 adult patients (including 407 women), the overall average BMI was 28.54 kg/m$^2$ (NCZI). In 2018, based on a sample of 1149 adult patients (including 335 women), this figure was 28.69 kg/m$^2$ (NCZI). Consumers are changing their lifestyles, including changes in the structure of the consumed food quality enhancers they maintain, although the BMI tendency is increasing.

Regular consumption of healthy food is one of the tasks of changing consumer behaviour. A typical Slovak consumer declares the need to live in harmony with nature, and a vital element of this attitude is healthy eating. Consumers are increasingly aware of their needs, analysing the composition of the products they purchase,

and being sceptical of dietary trends. His or her knowledge of healthy eating may be superficial, but he or she looks for reliable sources of product information. For example, it may be observed that social networks are among the most popular communication tools (Bartosik-Purgat and Jankowska, 2020); in connection with them, we encounter the term 'influencer marketing' (Nadanyiova et al., 2020).

The consumer represents a dynamic and mobile unit which constantly creates new needs and acquires knowledge through its own activity and the external environment. It forms its identity with the help of social interactions. Thus, individuals determine their own lifestyle and ways of consumption according to their own decisions. They are interested in new products such as healthy food; they search for innovative solutions, and they know how and where to find information (Nikodemska-Wołowik et al., 2020). According to Słaby (2006), these consumers are characterised bytheir rational attitude towards the wide range of productson the market, thanks to the possibility of accessing information from various sources.

The aim of our work was to find out more about the attitude of mothers towards choosing healthy food. The source basis for the work consists of the subject literature and the results of the authors' own research, conducted from January 2019 to May 2019 on a sample of 1373 respondents living in Slovakia. The authors' intention was to answer the following question: to what extent do households where the mother has the decisive word differ from others in terms of their food choices? This research paperis organised as follows: the first section contains a brief literature review about the role of mothers in healthy eating for families and society. The second section describes the research design, sample, method and data analysis. The third

part of the work presents and analyses the obtained test results. The paper ends with a discussion and conclusions, in which the main outcomes from the analyses are presented. It also indicates the limitations of the study.

The presented analyses of the results of direct research, as well as the conclusions drawn from them, may prove to be useful to governments, organisations promoting a healthy diet, and enterprises which produce and sell food when it comes to developing effective strategies for promoting healthy food, setting directions for consumer education in the field of proper nutrition, and improving the competitiveness of their products on the food market.

## 1. Literature review

An individual tends to repeat behaviour after a pleasant experience and not to repeat behaviour after an unpleasant one – the tendency to search for rewards and avoid punishment. Positivereinforcement stimuli create certain reactions in an individual and they become habitual due to the learning process. In this context, Risatlanti et al., (2011) andLoth et al., (2016) surmise that mothers play a pivotal role in the development of a child's eating behaviour and health, both directly through parental role modelling and indirectly through the transmission of attitudes, beliefs and values. This is important for marketers whenit comes to creating a food offer which positively influences parents in terms of food availability and guidance in food choices to provide healthy food.

Contento (2006) mentions that eating is a social act, and several recent studies have exploredthe food choices of adolescents in greater detail in the context of social networks, including the family. This may indicate that mothers are not always the gatekeepers; decision-making about food in a family is complex, and all members havea certain influence (see e.g. Feunekes, 1998; De Bourdeaudhuij, 1998). Slovak society is still considered traditional in that the woman's responsibility for the education of the children and caring for the household are strongly held convictions. Other studies are linked to decisions in the context of different diseases of civilisation such as obesity (cardiovascular diseases, high blood pressure) or stress (Buckert et al., 2014). In Slovakia, obesity is not particularly and statistically the focus of study, because it is understood as an associated disease. As a result, it is difficult to compare it with similar research abroad.

Most of the previous studies regarding food purchasing decisions come from the USA, Canada, Germany and China (e.g., Lee, 1987; Thiele and Weiss, 2003; Descher and Goddard, 2011; Liu etal., 2014). The role of the mother regarding food choice is described by Flax et al. (2021), who state that the acquisition and consumption of food is considered a personal domain that includes individual factors, such as accessibility, affordability, convenience and desirability. The interaction of these factors and their effect on food choice are mutually dependent because it is embedded within specific food, as well as sociocultural and economic systems (Flax et al., 2021).

The above mentioned obesity is very often the result of overconsumption rather than disease. Slovakia has been classified as a country where quantitative and qualitative malnutrition is equal to or below the average for this region, while overconsumption is relatively higher than in other European countries (Capacciet al., 2013; Maciejewski, 2018a).

Our research contributes to an understanding of how the decision-making of women affects the level of healthiness of their choice of food for others in a domain that has critical implications for millions of Slovak families.

# 2. Methodology

## 2.1. Research design

To better understand the complexity of the process of food choice among mothers, empirical research on the multifaceted nature of food consumption took various aspects of the potential of respondents, as well as the general characteristics of their households, into consideration.

Based on findings from previous research, the goal of this study is to extend the results from previous research (Kita et al., 2012) by exploring the differences among households in which the mother has the decisive word and other households in terms of the individual who has the strongest influence on the purchasing and preparation of healthy food. The differences that interested usrelated to four areas: the content of consumed foods, healthy foods, sustainable consumption, and the frequency of eating outside the home.

The questionnaire also contained questions related to the general characteristics of respondents and their households with respect to motivation, perception and attitudes, preferences generally influenced by education, employment, age, the financial situation in the households, residence, region, and also whether decisions were made by a woman or not. We explain these variables on the basis of the Expanded Theory of Planned Behaviour (ETPB); for example, recognising a mother´s food purchasing decisions is important in terms of a greater understanding of her behaviour.

## 2.2. Sample

Empirical research was conducted in the form of personal interviews with each respondent. Pre-research on a sample of 200 respondents was carried out before anonymous empirical research. During the pre-research phase, the comments of respondents dealing with the structure of the questionnaire were taken into account. The research was comprised of an intentional selection of 1373 basic collection units based on volunteering and availability in order to obtain the broadest and most accurate information. In these households, the mother, female partner or grandmother playedthe decisive role.

The general sample included 741 women (53.9%) and 632 men (46.3%). The average age of the respondents was 47.9 years. Table 1 characterises three situations in which the mother has the highest share in making decisions.

**Table1. Three situations in which the mother has the highest share in making decisions**

| Specification of purchasing situation | Mother | Father | Child | Grandmother | Grandfather | Another member | Malepartner | Femalepartner | N | Average | Deviation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Has the greatest influence on the purchasingof food | 956 | 267 | 116 | 5 | - | - | 5 | 20 | 1369 | 1.50 | 1.080 |
| Most frequently buys food | 936 | 333 | 68 | 4 | - | - | 8 | 18 | 1367 | 1.48 | 1.047 |
| Most frequently prepares food | 1098 | 161 | 73 | 8 | - | - | 10 | 17 | 1367 | 1.37 | 1.058 |

Source: Own elaboration.

Table 1 illustrates the prevailing traditional model of the family, in which multi-generational families are rare. It turns out that an unconventional family model – male and female partners – will be the object of further long-term research of the family home food environment. According to the socioeconomic and demographic charac-

teristics presented in Table 2, more than 95% of the women had either one child or two children. The traditional model with more children is slowly receding due to economic reasons and the rising age of mothers giving birth for the first time (+27 years). Slovak mothers mostly live in small families, which is typical for mothers with university education (45.1%) who are employed in the education and science sectors (24.4%) and live in cities with 50,000 tomore than 200,000 inhabitants.

Table 2. Background characteristics of female respondents

| Background characteristics | Percent |
| --- | --- |
| *Number of children* | |
| 1 child | 63.5 |
| 2 children | 31.8 |
| 3 children | 4.3 |
| 4 children | 0.4 |
| *Education* | |
| Primary | 2.2 |
| Secondary – did not graduate | 8.0 |
| Secondary | 44.7 |
| Higher | 45.1 |
| *Employment* | |
| Housewife | 6.3 |
| Maternity leave | 7.3 |
| Business, freelance | 11.4 |
| Manager | 7.7 |
| Scientist | 24.4 |
| Manual worker, shop assistant | 11.8 |
| *Financial situation* | |
| Very bad | 1.4 |
| Bad | 5.8 |
| Average | 36.0 |
| Good | 39.5 |
| Very good | 17.3 |
| *Place of residence* | |
| Rural: up to 5000 inhabitants | 21.4 |
| Urban: 5001 – 50,000 inhabitants | 34.3 |
| Urban: 50,001 – 100,000 inhabitants | 18.4 |
| Urban: 100,001 – 200,000 inhabitants | 0.3 |
| Urban: more than 200,000inhabitants | 25.3 |

Source: Own elaboration.

## 2.3. Method

Research results by Robson et al. (2016) confirm that consumers prefer convenience food or food prepared outside the home. This kind of food is calorically denser and of inferior nutritional quality, as it tends to be higher in saturated fats, sodium, and cholesterol, and lower in calcium and dietary fibres, compared to food prepared at home; furthermore, the portions are often larger than the recommended size (Robson et al., 2016). Identifying consumer preferences is considered to be one of the key concepts in the analysis of consumer behaviour (Vojáček, 2011).

The use of cluster analysis and decision trees for segmentation instruments is mentioned in the literature (Brida, 2014; Grossmanová et al., 2016). We performed consumer segmentation using cluster analysis, especially the two-step method, which is implemented in the SPSS statistical system. The input variables in the analysis were the opinion characteristics of the respondents, and the output variable was the identification of the cluster to which they belonged. The resulting clustering is of fair quality. Subsequently, we created two groups of classification trees in order

to get an overview of the segment structure created in the cluster analysis. In both cases, the explanatory variable was cluster membership. In one group, the explanatory variables were opinion characteristics; in the other group, the explanatory variables were socio-demographic characteristics. In both groups, we created trees using several algorithms that are implemented in the SPSS statistical system.

We assumed that the respondents had a positive attitude toward their health. According to Kita et al. (2017), predispositions of the individual respond to the subject in a favourable or unfavourable way. Patch et al., (2005) took the intention to consume healthy foods into consideration as the only significant predictor. For example, Nystrand and Olsen (2020) emphasise the importance of nutrition and health awareness and information; cognitive and sufficient antecedents such as attitudes, perceptions, and beliefs; product properties; and sociodemographic variables and consumer choice regarding organic foods.

## 2.4. Data analysis

Cluster analysis (e.g. Řezanková et al., 2009; Kinnunen et al., 2021) deals with the similarity of data items. It resolves the division of a set of items into several unspecified groups (clusters) to ensure that items from different clusters are the least similar to each other (Bhatt et al., 2020). Cluster analysis can be carried out through methods which differ according to the determination of the similarity of items (measure of similarity) and clustering methods (hierarchical and non-hierarchical) (Grossmanová et al., 2016). The selection of the cluster analysis method depends on whether source data or aggregated data (e.g. a frequency table or a similaritymatrix) are available. If source data are available, the methods are dependent on the type of variables (nominal, ordinal and quantitative variables).

Statistical systems usually include both a hierarchical algorithm, for which the result is depicted in the form of a *dendrogram*, and a non-hierarchical iterative algorithmin the form of a two-dimensional cluster analysis. A two-step method was implemented in version 11.5 of the statistical SPSS system. The two-step method was the most suitable data-processing method, mainly due to its ability to objectively determine the optimal number of clusters without requiring a user. The aim of the construction of decision trees (Žambochová, 2008) was to create the most homogeneous sets possible with respect to the explained variable.

The root of the tree represents the entire set of data which is recursively divided by using specific decision criteria related to the explanatory variables. The sheets of the resulting tree include sets of items that could have the same value as the explained variable. For this purpose, questions were included in the questionnaire about which person in the household has the strongest influence on the purchasing of food, who most frequently buys food, and who most frequently prepares food. We then divided the households into eight groups according to these questions. These groups were very unbalanced in terms of numbers, which is why not all were included for further processing. Most were households in which the mother or father had the greatest influence. The number of households in which a child, grandmother or partner had the greatest influence was significantly smaller. Other groups had no members. We compared the groups created in this way from several points of view, both in terms of the composition of food consumed and in terms of the degree of healthy nutrition, but also from the point of view of sustainable behaviour and the frequency of eating outside the home. For these reasons, the most relevant test for reaching our goal

was a non-parametric, two-sample Mann-Whitney test. In some cases, we added a non-parametric Kruskal-Wallis Test to compare several independent choices. In all of the tests we worked with a zero hypothesis in which choices are comparable from the point of view of their level. We worked at a 5% or 10% level of importance. They were later used for reaching the goal that regression decision trees created with the help of a CRT algorithm.

## 3. Results

Table 3 shows the resulting p-values of tests performed on the self-consumption of different types of food from the point of view of who has the strongest influence on the purchasing of food (1), who most often buys food (2), and who most often prepares food (3). With the help of the Kruskal-Wallis Test (K.W.) we were able to determine the differences between the groups, whilewith the help the Mann-Whitney Test (M.W.) we studied the differences between households in which mothers have the decisive wordand others. The values pointing to statistically significant differences between choices on the 5% level of importance are highlighted in grey, and the values pointing to statistically significant differences between choices on the 10% level of importance are highlighted in black.

Table 3. Resulting p-values of tests performed on the self-consumption of consumed goods

| Specification | (1) K.W. | (1) M.W. | (2) K.W. | (2) M.W. | (3) K.W. | (3) M.W. |
|---|---|---|---|---|---|---|
| Milk and dairy | .054 | .017 | .248 | .024 | .000 | .000 |
| Baked goods and bakery products | .000 | .000 | .021 | .002 | .002 | .001 |
| Vegetables | .554 | .360 | .326 | .579 | .000 | .000 |
| Fruit | .556 | .204 | .571 | .280 | .000 | .000 |
| Meat and meat products | .733 | .994 | .495 | .166 | .332 | .414 |
| Fish and fish products | .476 | .876 | .898 | .478 | .656 | .229 |
| Seafood | .161 | .998 | .128 | .788 | .016 | .220 |
| Sugar and sweets | .093 | .078 | .125 | .058 | .018 | .525 |
| Eggs | .358 | .643 | .158 | .055 | .000 | .003 |
| Legumes | .314 | .909 | .346 | .890 | .164 | .262 |
| Vegetable fats | .833 | .497 | .373 | .317 | .715 | .536 |
| Animal fats | .083 | .040 | .318 | .090 | .126 | .803 |
| Nuts | .167 | .062 | .083 | .044 | .069 | .008 |
| Unsweetened non-alcoholic drinks | .129 | .068 | .605 | .530 | .118 | .073 |
| Sweetened non-alcoholic drinks | .284 | .857 | .530 | .919 | .062 | .112 |
| Coffee | .405 | .737 | .509 | .108 | .407 | .210 |
| Tea | .772 | .267 | .423 | .080 | .013 | .002 |

Source: Own elaboration.

According to the above mentioned results and a comparison of the average ranking across the results of both tests, it is clear that a significant quantity of dairy products is purchased in households in which food is prepared by the mother. A slightly weaker difference was recorded from the point of view of the purchasing of food, but the consumption of dairy products when the mother is the leading personality in the household is higherin this case as well. On the contrary, the least amount of food is consumed in households where a man – whether the father or partner – supervises the purchasingof food. The highest consumption of baked goods was recorded in households where the grandmother has the strongest influence on the purchasing

and preparation of food. In terms of the purchasingof vegetables, statistically significant differences were only recorded in the preparation of food and the only distinctly different group were households in which food is prepared by a man. These households consume significantly fewer vegetables compared to other households. All other households consume vegetables in a comparable way. The same was true for the consumption of fruit. No differences were recorded in the consumption of meat and fish. In the case of seafood, just one group differed significantly – the household in which food is predominantly prepared by the grandmother. Seafood is seldom prepared in such households.

The opposite situation occurred as far as the consumption of sugar and sweets are concerned. Only households in which food was mostly prepared by the grandmother recorded a much higher consumption of sweets.

The same was true for the consumption of eggs. Again, in households under the care of grandmothers, the consumption of eggs was much higher than in the other households. In contrast to this, households in which food is predominantly prepared by the father consumed a much smaller amount of eggs. No significantly statistical differences for the consumption of animal fats and legumes were recorded. All household groups consumed this food toa comparable extent. Slight differences were found in the consumption of animal fats and nuts in households in which food is mostly prepared by the grandmother. In these households, animal fats were consumed to a greater degree, while nuts were consumed to a lesser degree. The consumption of unsweetened non-alcoholic drinks differed significantly in households in which food is purchased and prepared by the mother. In these households, such drinks are consumed more frequently. In the case of sweetened non-alcoholic drinks, the situation is similar but not assignificant. All households behaved comparably in terms of the consumption of coffee. Tea is more frequently consumed in households where food is mostly prepared by the mother and least frequently consumed in households where food is mostly prepared by the father. Furthermore, in households where the mother mostly makes decisions in the sphere of influence on the purchasing and frequency of purchasing food and the preparation of food, thereisa stronger sense that they consume more milk and dairy products, baked goods and nuts. In households where the mother most frequently preparesthe food, it is assumed that more fruits, vegetables, eggs, tea and unsweetened non-alcoholic drinks are consumed compared to other households. In households where a woman usually buys food, a large consumption of sugar and animal fats is assumed. In other cases, households in which the mother has a decisive say on what to eat donot differ from other households. Interestingly, this stronger feeling of largerconsumption in households in which the mother plays the important role relates to healthy food (dairy, fruits, vegetables, nuts) as well as unhealthy food (sweets, animal fats). It is also interesting that differences in the consumption of some kinds of food arosein households where the food is mostly prepared by the mother and not in households where the mother makes decisions. But it also works in the opposite way. It is clear that the households in which the mother plays a main role in establishing eating habits differ in many respects from other households. For this reason, we focused only on these households. We were interested in which kind of food the feeling of high consumption is strongly characteristic for in households in which the mother plays a significant role in the sphere of food

consumption. Therefore, we used regressive decision trees with the help of a CRT algorithm. The dependent variables were indicators about whether the mother has a decisive say in a certain area in the household. The independent variables were scale indicators indicating the strength of feeling that households consume many selected types of food. The resulting risk estimations ranged from 0.2 to 0.3, which means that 70 to 80% of the objects were listed correctly, and all tree models reported relatively good quality. According to the structure of the first tree (appendix1), the most characteristic feeling in households in which the mother is mostly responsible for the purchasingof food relates to high levels of consumption of fruit (p2.4), sweets (p2.8) and dairy (p2),as well as the low consumption of meat (p2.5) and sweet non-alcoholic drinks (p2.15).

Table 4 is hows the resulting p-values of the tests concerning the degree of consumption of different types of food from the point of view of the person who has the strongest influence in the house hold on the purchasing of food (1), who most often buys the food (2), and who most often prepares the food (3). With the help of the Kruskal-Wallis Test (K.W.) we found differences between each of the examined groups, and with the help of the Mann-Whitney Test (M.W.) we found differences between households in which the mother had the decisive word and the other households. The values indicating statistically significant differences between choices on the 5% level of importance are highlighted in grey and the values indicating statistically significant differences between choices on the 10% level of importance are highlighted in black.

**Table 4. Resulting p-values of tests performed on the self-consumption of healthy food**

| Specification | (1) K.W. | (1) M.W. | (2) K.W. | (2) M.W. | (3) K.W. | (3) M.W. |
|---|---|---|---|---|---|---|
| We consume foodregularly (4-5 meals every 3-4 hours) | .104 | .024 | .010 | .023 | .010 | .017 |
| We try to eat at least half of the recommended amount of fruit and vegetables | .804 | .623 | .331 | .367 | .083 | .018 |
| We consume cereals, mainly wholegrain ones | .719 | .505 | .658 | .871 | .119 | .059 |
| We drink milk every day, possibly substitutingit with yoghurt, acid-milk or cheese | .400 | .161 | .971 | .956 | .050 | .012 |
| We limit the consumption of smoked meats and meat, mostly red meat. | .096 | .127 | .961 | .905 | .005 | .003 |
| We include fish, eggs, and legumes (e.g.beans and peas) in our meals | .213 | .164 | .376 | .309 | .003 | .005 |
| We decrease the consumption of animal fats and substitute them with vegetable fats | .108 | .033 | .302 | .909 | .054 | .016 |
| We avoid the consumption of sugar and sweets | .456 | .676 | .419 | .460 | .066 | .201 |
| We drink at least 1.5 litres of water every day | .423 | .214 | .861 | .443 | .048 | .198 |
| We don´t oversalt meals. | .867 | .692 | .171 | .619 | .013 | .008 |
| We buy products with low salt content | .375 | .322 | .170 | .092 | .021 | .017 |
| We use herbs in the preparation of food | .547 | .198 | .787 | .578 | .116 | .087 |
| We don´t consume alcohol | .730 | .219 | .826 | .596 | .002 | .000 |
| We are physically active every day | .147 | .300 | .780 | .717 | .640 | .939 |

Source: Own elaboration.

Based on the above mentioned results and a comparison of the average ranking across the results of both tests, consumption is significantly less regularin households where the grandmother takes care of the purchasingand preparation of food. Households where food is mostly prepared by the mother strive to consume the largest possible supply of vegetables, while households where the grandmother prepares the food lag behind. Households where food is mostly prepared by the mother consume more cereals (mostly whole grain) than households where food is mostly prepared by the father. Households where food is mostly prepared by the mother recorded the highest consumption of milk and dairy products, while households where the grandmother prepares the food recorded a lower consumption of meat and dairy products. The opposite situation was recorded in the case of meat and sausages, as mothers more strenuously attempt to restrict consumption when compared to grandmothers. Fathers are significantly more lenient about consuming these foods than mothers. Grandmothers and mothers try to include more fish, legumes and eggs than dofathers. There were no significant differences in terms of areduction in animal fat intake. Nevertheless, mothers strive for most restrictions. Even less significant are differences in the reduction of sugar and sweets. In this case the least effort is made by grandmothers.

Adherence to a drinking regime is alsothe least guarded by grandmothers. Mothers try their best not to salt too much. Grandmothers are the least interested in buying products with low salt content, as well as makingthe greatest effort to discourage the consumption of alcohol. The same holds true for mothers. No differences were recorded from the point of view of the physical activities of the members of the household.

Based on the above mentioned results and a comparison of the average rankings, households in which the mother most often prepares foodlive more healthily on average than other households. However, no major differences among the households were recorded in terms of the consumption of sweets, adherence to a drinking regime and physical activity. This could be attributed to the fact that these three areas donot directly correspond with the preparation of food.

It is interesting to note that households in which the mother is dominant in the sphere of food purchasing decisions do not significantly differ from other households. The only exceptions were found in the regularity of meals and decreased consumption of animal fats. We were also interestedin which parts of a healthy lifestyle were characteristic for households in which the mother has an important role in the sphere of eating. For this purpose, we created regression decision trees with the help of a CRT algorithm. The dependent variables were the signs of whether the mother has the decisive word in the household. The independent variables were scale indicators indicating the degree of compliance of a given component of a healthy lifestyle. Three decision trees indicating who in the household has the strongest influence on the purchasing of food (appendix 2), who most frequently buys the food (appendix 3), and who most frequently prepares the food (appendix 4) were gradually formed. The resulting risk estimates ranged from 0.2 to 0.3, which proves that 70 to 80% of the objects were ranked correctly, and the tree models were of a reasonably good quality.

Based on the structure of the first tree, the most characteristic featuresin familiesin terms of the purchasingof food were those with the strongest influence of the mother on the regular diet (p3.1), the decreased

use of animal fats (p3.7), less physical activity (p3.14), less adherence to a drinking regime (p3.9) and non-avoidance of salty dishes (p3.11). According to the structure of the second tree, the most characteristic features for households where the purchasing of food is mostly provided by the mother were regular eating (p3.1), the use of herbs (p3.12), non-avoidance of salty dishes (p3.11) andlower consumption of whole grain baked goods (p3.3). According to the structure of the third tree, the most characteristic features for households where the mother usually prepares the food include the low consumption of alcohol (p3.13) and regular eating (p3.1). Households that do not fully avoid alcohol try at least to limit consumption of sausages (p3.5) and adhere to a drinking regime (p3.9).

Table 5 shows there sulting p-values of tests. Once again, the values pointing at statistically important differences between choices on the 5% level of importance are highlighted in greyand the values pointing at statistically important differences between choices on the 10% level of importance are highlighted in black.

Table 5. Resulting p-values of tests performed on the self-consumption of special types of food

| Specification | (1) K.W. | (1) M.W. | (2) K.W. | (2) M.W. | (3) K.W. | (3) M.W. |
|---|---|---|---|---|---|---|
| Ecological food | .517 | .383 | .466 | .481 | .47 | .173 |
| Pre-prepared food | .023 | .095 | .401 | .227 | .341 | .315 |
| Functionalfood | .100 | .594 | .752 | .692 | .632 | .847 |
| Home conserved food | .045 | .297 | .034 | .972 | .003 | .148 |

Source: Own elaboration.

Based on the above results and a comparison of the average ranking across the results of both tests, no differences were foundfrom the point of view of frequency of consumption of ecological and functional food. Relatively minor differences were recorded in the case of pre-prepared food where, surprisingly, this food was consumed the most in households in which the grandmother had the strongest influence. A slightly lower degree of consumption was recorded in households where the mother had the strongest influence on the purchasing of food as opposed to households where the father had the strongest influence. In the case of food stored at home, the highest frequency of consumption was recorded in households in which thegrandmother had the strongest influence on the purchasingof food. In a deeper study of the reasons behind a family's decision not to buy a specific type of food, we found that fathers had the feeling that ecological food was not sold in their store. Children recorded a slightly lesser degree of interest in ecological food. Mothers and fathers have less trustin ecological food. From the point of view of ecological food, the proximity of shops that sold itwas not a factor. In the case of pre-prepared food, only differences in the level of interest in this foodwererecorded. Surprisingly, households in which a grandmother had the strongest influence on the purchasing of food recorded the highest level of interest, and women generally showed a greater level of interest in this food. In the case of functional food, only differences from the point of view of trust in this food and the proximity of shops that sold it were recorded. Fathers had the least trust in functional food, and grandmothers were most influenced by the proximity of the shops.

Table 6 shows the resulting p-values of the tests. The values showing statistically significant differences between choices on the 5% level of importance are highlighted in grey and the values showing statistically

significant differences between choices on the 10% level of importance are high- lighted in black.

Table 6. Resulting p-values of tests performed on self-consumption outside the home

| Specification | (1) K.W. | (1) M.W. | (2) K.W. | (2) M.W. | (3) K.W. | (3) M.W. |
|---|---|---|---|---|---|---|
| Restaurants | .001 | .012 | .394 | .257 | .016 | .007 |
| Cafés | .019 | .370 | .529 | .964 | .088 | .104 |
| Bars | .009 | .217 | .080 | .810 | .000 | .016 |
| Pubs | .008 | .839 | .009 | .617 | .001 | .046 |
| Pizzerias | .123 | .251 | .726 | .863 | .140 | .173 |
| Fast food | .023 | .361 | .323 | .632 | .061 | .043 |
| Canteens | .123 | .824 | .198 | .697 | .341 | .347 |
| Catering | .937 | .721 | .451 | .971 | .030 | .006 |

Source: Own elaboration.

Based on the above mentioned results and a comparison of the average ranking across the results of both tests, house- holds in which food is mostly prepared by the father or sometimes by a child most often eat in restaurants. On the contrary, households in which food is prepared by the grandmother or mother tend to eat less frequently in restaurants. It is interesting that households where the grandmother has a decisive influence on the purchasin- gof food are among those that use food services and cafés the most.

Households which are led by a child recorded the most frequent visits to bars and pubs. No differences were recorded in the frequency of visits to pizzerias and canteens. Catering was least often used by households in which the grandmother mostly prepares the food; on the contrary, catering was most often used by house- holds in which the father usually prepares the food.

## 4. Discussion

The most important element of the entire sphere of consumption is the consumption of food, because the nutritional purposes of people are of basic character and their fulfilment is a leading issue in all socio- economic conditions (Moisio et al., 2004). The quantity, quality and type of food pur- chased affects the health of society, meas- urably shaping the quality of human capital (Jansi Rani et al., 2019).

Households in which the eating hab- its are led by the mother live better than other households from the point of view of healthy food. The ETPB has been prov- ento play a vital role in understanding a mother's attitude regarding food choice. Relevant studies have provided evidence that the ETPB can effectively explain and predict the intentions of different types of decisions regarding food choicesin creat- ing a good family environment; they have drawn attention to the differences in the underlying psychological variables behind the intentions of different relatives to con- sume unhealthy food (Capiro et al., 2008; Currie, 2009). The decision trees charac- terised in detail the interest of the mother in health of the family and the orientation of her reasons for reaching this intention.

Furthermore, in accordance with the lit- erature on parenthood and the motivation of adults regarding food choice, behaviour within the family has a direct influence (Patrick and Nicklas, 2005). According to the above mentioned results, it is clear that from the point of view of consumer behaviour, relatively worse attitudes were found in households in which grandmoth- ers had the decisive influence on the pur-

chasing and especially the preparation of food. This finding relates to a healthy diet, because other membersof the family prefer to search for opportunitiestoeat in restaurants. That means that the concept of a family food environment (Jabs et al., 2007) become more important in determining their behaviour and food choice. Despite these outside influences, children will still look to their homes and parents for food availability and guidance in food choices.

This last observation shows that mothers develop through interactions and practices within families, including repeated exposure to food leading to familiarity, use of food as rewards, adult modelling, the social-affective contexts of eating, and parental controlling behaviours (Harper and Sanders, 1975; Birch, 1999; Contento et al., 2006). Mothers decrease the possibilities of preferences in the consumption of junk food and increase support for health-promoting behaviours and emotional well-being (Contento et al., 2006).
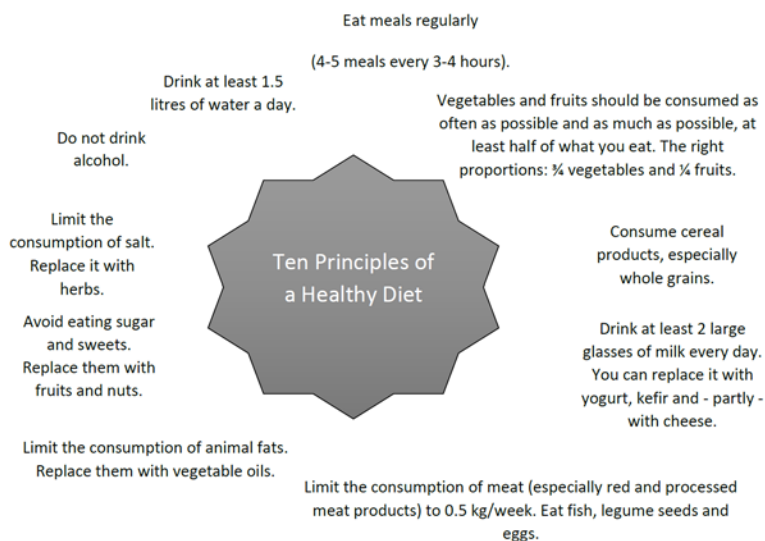
## Conclusions

In households where the mother supervises eating, unlike other households, more attention is paid to the sufficient consumption of milk and dairy products, nuts, fruits and vegetables, as well as tea and unsweetened non-alcoholic drinks. These households also try to eat regularly, decrease their consumption of animal fats, and prefer food prepared at home to convenience and tinnedfood. Unfortunately, these households engage in less physical activity, consume anunnecessarily high amount of salty food and do not have a sufficient drinking regime. Last but not least, these households eat less frequently outside the home than other households. The results of this study have implications for both research and practice, as it has identified different decisions by which the motherchoosesfood forher family. Future

research should investigate certain patterns of communication within a family; in other words, whether communication between children and parents and between children and their peers can result in healthy diets.

Moreover, the government and organisations promoting healthy eating should prepare social campaigns propagating healthy eating. They should also break current behavioural patterns. An example of such involvement could be a campaign in which, for example, a grandmother encourages her grandchildren to eat fruit and vegetables, while warning them off eating sweets. Another solution may be asocial campaign in which fathers listen to their wives about nutrition, and eat healthy food, thus settingan example for their children. Such campaigns should also be joined by food producers and sellers who want to build apositive image of their brand as a responsible producer and seller. Such campaigns are supported by the WHO, which updated the recommendations for a healthy diet in August 2018 (WHO, 2018). This document presents a comprehensive concept of the nutrition of modern humans. Its implementation gives them a better chance of a long and healthy life and the preservation of intellectual and physical fitness until their later years. It can be contained in the 10 principles presented in Figure 1.

**Figure 1. Principles of a healthy diet**

Eat meals regularly

(4-5 meals every 3-4 hours).

Drink at least 1.5 litres of water a day.

Vegetables and fruits should be consumed as often as possible and as much as possible, at least half of what you eat. The right proportions: ¾ vegetables and ¼ fruits.

Do not drink alcohol.

Limit the consumption of salt. Replace it with herbs.

Ten Principles of a Healthy Diet

Consume cereal products, especially whole grains.

Avoid eating sugar and sweets. Replace them with fruits and nuts.

Drink at least 2 large glasses of milk every day. You can replace it with yogurt, kefir and - partly - with cheese.

Limit the consumption of animal fats. Replace them with vegetable oils.

Limit the consumption of meat (especially red and processed meat products) to 0.5 kg/week. Eat fish, legume seeds and eggs.

Source: WHO, 2018, 1-6; Maciejewski, 2018b.

When comparing the recommendations with the previously presented patterns of food consumption in Slovakia, a clear discrepancy can be noticed between them. The current feeding patterns of Slovakia (as well as Poland, the Czech Republic and Hungary), according to The Lancet Global Health Journal, place them squarely among the societies with the worst diets in the world (Maciejewski, 2018b). If half the daily diet of the inhabitants of these countries were to consist of fruit and vegetables, they should eat about 500g per day of them. In addition, they should drink about 500ml of milk per day, replace pork and poultry with fish, increase the consumption of eggs, cheeses and curd, as well as significantly reducing the consumption of alcohol and tobacco.

The authors of the paper are aware of the limitations of their research, which cannot be regarded as fully representative of the entire population of consumers. However, its conclusions and observations can be used as arguments in the debate on creating better eating conditions at home, promoting healthy eating, and improving the quality of life of Slovak society. It is also worth noting that the research was carried out before the outbreak of the COVID-19 pandemic, and therefore does not include its effects on changing the nutritional behaviour of Slovak consumers related to the risk of transmission of the disease.

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**Pavol Kita** is a Professor at the University of Economics in Bratislava and a member of the Marketing Department and leads the scientific grants from the Ministry of Education, Science, Research and Sport of the Slovak Republic. He also works as an academic tutor. His scientific interests are mainly in the areas of marketing, consumer behaviour and business models in food retailing. He is a member of the PGV International Scientific Network. ORCID no.: 0000-0001-5870-9328.

**Grzegorz Maciejewski** holds a postdoctoral degree in Economic Sciences. He is a Professor at the University of Economics in Katowice, and is Head of the Market and

Consumption Department. He is a research projects manager at the Research and Development Centre in Katowice and the manager and contractor of six grants from the Ministry of Science and Higher Education. He is an academic tutor. His scientific interests are mainly in the area of behavioural economics. He is the author of over 150 articles in the areas of consumer behaviour, the marketing strategies of enterprises and market and marketing research methodologies. He is a member of the Polish Society of Market and Opinion Researchers (PTBRiO), the Polish Scientific Marketing Society, the Polish Economic Society and the PGV International Scientific Network. ORCID no.: 0000-0002-1318-0747.

**Marta Žambochová** is an Associate professor at J.E. Purkyne University and a member of the Mathematical and Informatics Department. Her research interests are in the fields of programming and systems analysis and on the current pedagogical scope in the field of statistics and econometrics. The most important areas of her activity are the connection of statistical and econometric theories with information technology. She is a member of the Czech and Slovak Statistical Society. ORCID no.: 0000-0239-9191-0700.

**Ján Strelinger** is a junior researcher at the University of Economics in Bratislava and a member of the Department of English Language. He conducts research activity on the effects of consumption culture on the food market.

**Veronika Kitová Mazalánová** is a junior researcher at Comenius University in Bratislava and a member of the Department of Pedagogical Science and Andragogy, who conducts her research and development activities in educational innovation for consumers in the field of food consumption. She is a member of the PGV International Scientific Network.
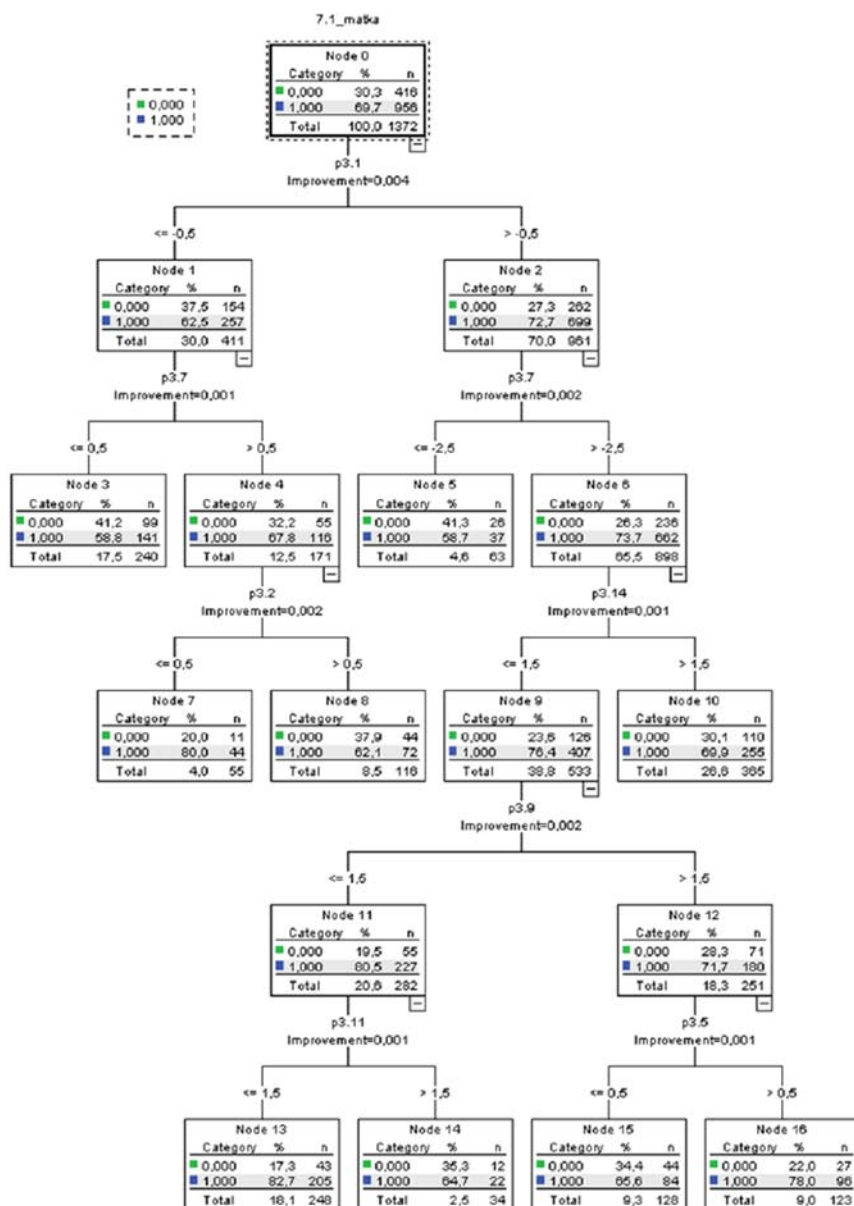
## Appendix 1.
Mothers responsible for the purchasingof food
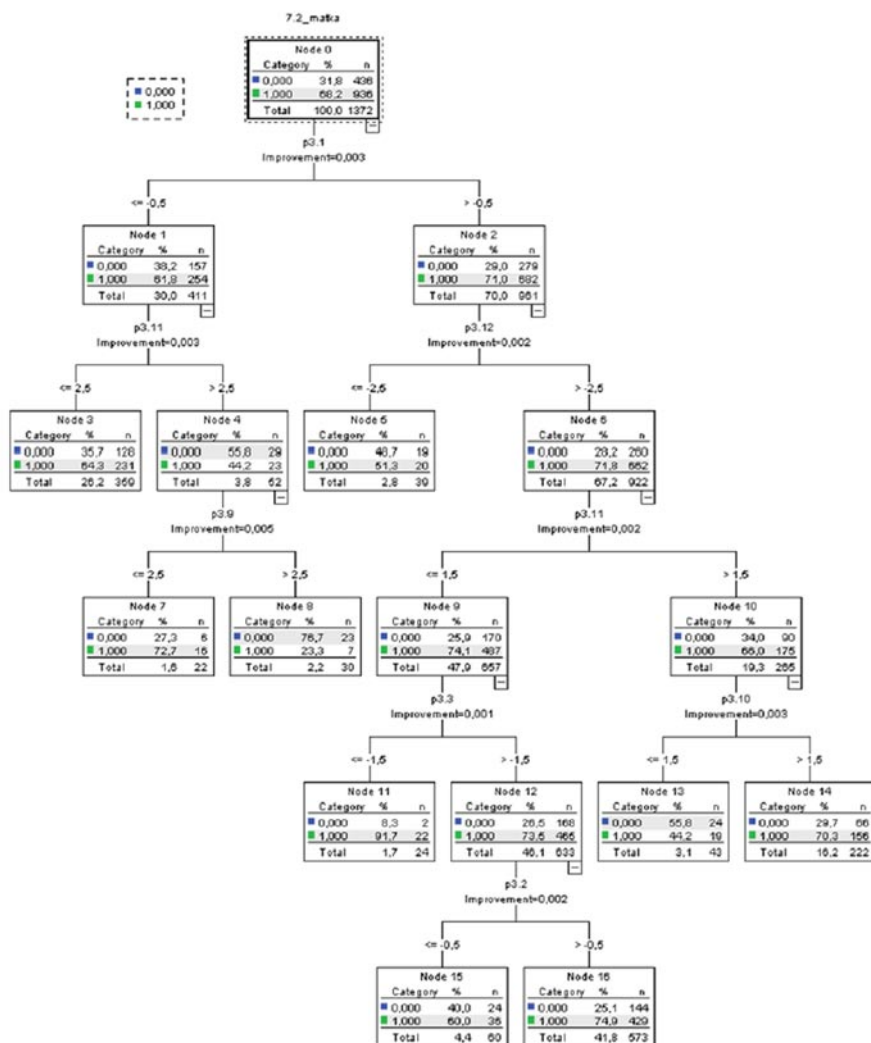


Source: Own elaboration.

Appendix 2.
Person in the household who has the strongest influence on the purchasing of food
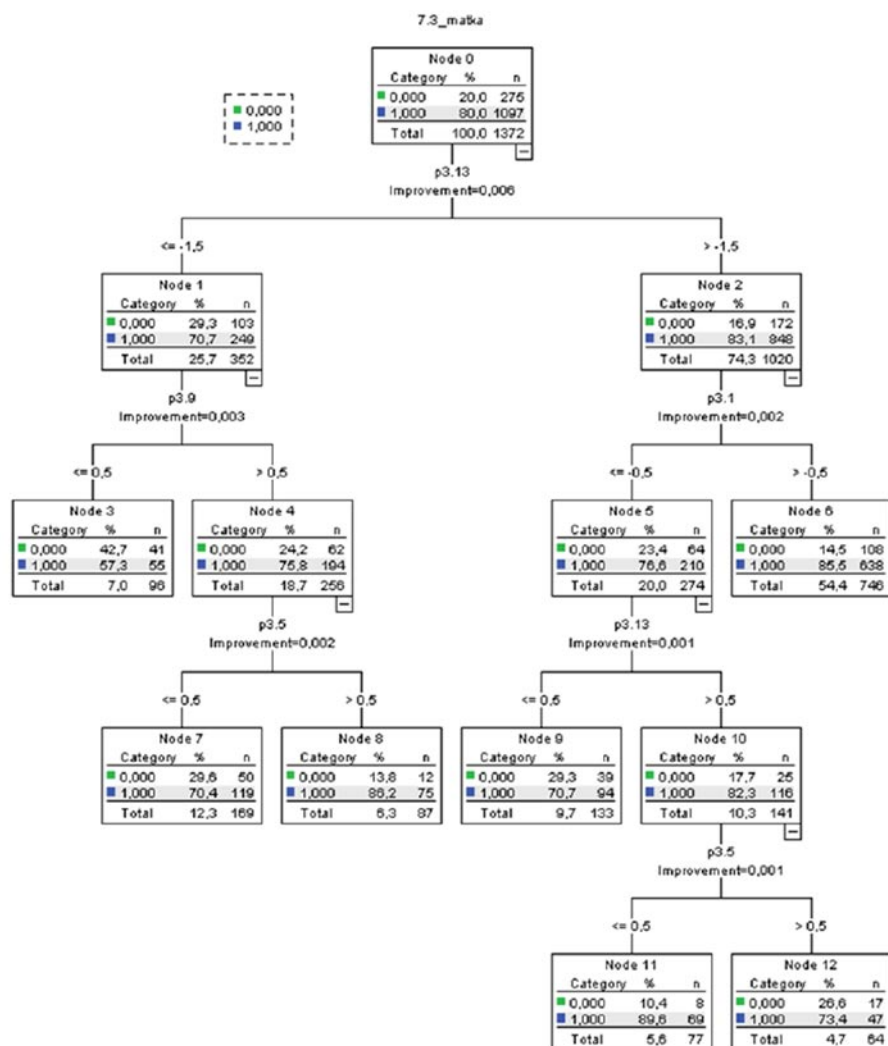


Source: Own elaboration.

## Appendix 3.
Person who most frequently buys the food

Appendix 4.
Person who most frequently prepares the food