Consumer attitudes to the temperate zone fruit and its consumption in the Slovak Republic: Case study from the Nitra region

Postoje spotrebiteľa k ovociu mierneho pásma a k jeho spotrebe v SR: prípadová štúdia z nitrianskeho regiónu

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Abstract: The fruit consumption in the Slovak Republic rates below the European average. There are several reasons causing this situation: the financial situation of the inhabitants, high prices of the temperate zone fruit in shops and the unhealthy eating habits of the consumers. The expenses on fruit have been decreasing within the consumer basket in our country. The consumption of fruit and the fruit products (in the value of fresh fruit) rose in 2006 in comparison with 2005 and achieved 54.0 kg per capita. The increase of fruit consumption was recorded thanks to the growth of the fruit containing products. Despite the rising tendency of the fruit consumption per capita, it is still much lower than the recommended dose. Based on the questionnaire survey, the objective of this paper is to identify and analyse the attitudes and behaviour of Slovak consumers, particularly from the Nitra region, to the temperate zone fruit consumption. The survey showed that health is the most important reason for the temperate zone fruit consumption. Apples and grapes are the most frequently consumed sorts. They comprise 50% of the total consumption of the temperate zone fruit. The consumption of the temperate zone fruit has stagnated recently according to the responses of half of the respondents, and even 66% of them would like to increase the temperate zone fruit consumption. Consequently, the dependence of the particular answers to the questions and the indications of a respondent (sex, age, education, locality) were studied by the use of the associative analysis.

Key words: consumption, temperate zone fruit, questionnaire, associative analysis, Slovak Republic

Abstrakt: Spotreba ovocia sa v SR pohybuje pod európskym priemerom. Dôvodom je nielen finančná situácia obyvateľov a vysoké ceny ovocia mierneho pásma v predajniach, ale ešte stále aj nie veľmi racionálne stravovacie návyky spotrebiteľov. Výdavky na ovocie sa u nás v rámci spotrebného koša znižujú. Spotreba ovocia a ovocných výrobkov (v hodnote čerstvého ovocia) v roku 2006 stúpala oproti roku 2005 a dosiahla 54,0 kg na osobu. Vzrast spotreby ovocia je zapríčinený nárastom spotreby výrobkov obsahujúcich ovocie. Hoci spotreba ovocia na obyvateľa má vzrastajúci trend, je stále oveľa nižšia ako je odporúčaná dávka. Cieľom príspevku je na základe vyhodnotenia dotazníkového prieskumu identifikovať a analyzovať postoje a správanie slovenského spotrebiteľa ovocia konkrétne z nitrianskeho regiónu, so zameraním sa na jeho spotrebu ovocia mierneho pásma. Ako vyplýva z výsledkov prieskumu, najčastejším dôvodom konzumácie ovocia mierneho pásma je pre respondentov zdravie. Najkonzumovanejšími druhmi sú jablká a hrozno a na celkovej spotrebe ovocia sa ovocie mierneho pásma podieľa asi 50%. Konzumácia ovocia mierneho pásma za posledné obdobie u polovice respondentov stagnovala a až 66% opýtaných by rado zvýšilo spotrebu ovocia mierneho pásma. Následne sa využitím asociačnej analýzy zisťuje závislosť jednotlivých odpovedí na dotazníkové otázky a identifikačných znakov respondenta (pohlavie, vek, vzdelanie, osídlenie).

Kľúčové slová: spotreba, ovocie mierneho pásma, dotazník, asociačná analýza

In order to achieve success in the domestic and foreign markets, the producers and distributors should know the customers' behaviour and possibilities how to affect them positively to their advantage. The consum-

ers make many shopping decisions every day (Nagyová et al. 2007). As stated by Bielik and Šajbidorová (2009), consumer demand can be considered as the primary one. The demand of consumers crucially influences the amount and structure of production and supply, both in time and space. In order to achieve success in the domestic and foreign market, producers and distributors should be aware of the consumer behaviour and have a good command of efficient methods of influencing it to reach benefit. A theoretical model of the modern food consumption is presented and built on the assumption that the utility from different food characteristics is accumulated over time. The characteristics considered include energy content, taste, health, status and environmental (as well as political and ethical) proprieties, time and financial costs (Horská and Sparke 2007). One of the present fundamental presumptions for the consumer behaviour research is the fact that people often buy products not because of their main function but for their subjectively perceived value. It does not mean that the products' basic function is not important, but that the today's role of product exceeds its service limits (Solomon 2004). The consumer behaviour research enables a better understanding and forecasting not only of the subject of purchases but also of purchasing motives and purchasing frequency (Schiffman and Kanuk 2004). The development of the index of the basic food consumption has shown a positive trend mainly in the significant growth (up to 40%) of vegetables and fruit consumption since 1990, as wrote Foret and Paděra (2008). Rural consumers' attitudes and purchase intentions towards organic and free-range produce is explained by consumers' food safety concern, ethical lifestyle and price perceptions. Attitude partially mediates the effects of ethical lifestyle and price on intention to purchase organic produce as well as the effect of ethical lifestyle on intention to purchase free-range produce (Michaelidou and Hassan 2010).

According to Kudová and Chládková (2008), the key task of fruit production is to grow, store and supply fruit in the sufficient amount and quality to satisfy the customers' needs. Besides, fruit growing is a renewable resource of wealth, it contributes to the sustainable development in the country, and it supports tourism and participates in landscaping (Webber et al. 2010).

The development of fruit consumption is influenced predominantly by the living standard, the level of consumer prices, the average incomes of inhabitants, tradition and the commodity quality. The average fruit consumption in the Slovak Republic is about 54 kg per capita a year. It is much less in comparison with the old 15 countries of the European Union where the consumption is 112.8 kg. According to the recommendations of the World Health Organization, children should consume 400 g of fruit and vegetables per day. In Europe, only the children in Greece and Italy ingest this amount of vitamins. With the average consumption of 200 g per capita a day, Slovakia ranges among the countries with the least fruit consumption in the European Union. Fruit and vegetables are the inevitable part of our diet because they contain the components useful for the human body, such as the soluble fibre, vitamins and mineral substances. The results of the questionnaire survey showed that the Slovak population has still some reserves in the consumption of the temperate zone fruit.

MATERIAL AND METHODS

Based on the questionnaire survey, the objective of this paper is to identify and analyse the attitudes and behaviour of Slovak consumers, particularly from the Nitra region, to the temperate zone fruit consumption. We used the inquiry method in order to achieve our target and to collect the information and data about the consumer behaviour. The inquiry was carried out in both written and electronic ways by using the methodological tool of questionnaire. The questionnaire was created in accordance with the legitimate rules for the questionnaire creation.

We used the random choice of respondents from the Nitra region. We also assumed that each respondent had the adequate experience in purchasing fruit so that s/he could complete the questionnaire correctly. Therefore, the appropriate respondent was the member of a household who was responsible for purchasing fruit for own consumption or the consumption of her/his household. We chose only one respondent from each household.

255 respondents participated in the questionnaire survey. Four answerers gave the negative response to the first question, which meant they could not continue. Thus, the applicable sample was represented by 251 respondents – 108 men (43.03%) and 143 women (56.97%). According to their age, the answerers were divided into three categories: 79 respondents (31.47%) were younger than 25 years, the age between 26–45 was represented by 89 respondents (35.46%), 83 respondents (33.07%) belonged to the category 46 and older. From the aspect of education, 3 respondents (1.2%) completed the primary education, 20 respondents (7.97%) the vocational education, 145 respondents (57.77%) the secondary education and 83 answerers (33.07%) the university education. From the analysed

sample of respondents, there are: 49.0% employed, 3.59% entrepreneurs, 6.37% unemployed, 37.85% students and 3.19% retired. 47.81% are urban residents and 52.19% live in the countryside.

After the evaluation of the obtained information from the questionnaire survey, we used the associative analysis. This analysis allows studying the relations and dependences between the qualitative indications, i.e. whether there is the statistically evidential dependence between the response to a particular question and some of the studied identification marks (IM) of a respondent (sex, age, education, locality). The dependence between the answers to the chosen questionnaire items and the particular identification marks was evaluated systematically.

In this article, we used the program Statgraphics which provides the testing of dependence between two qualitative marks. This program enabled us to test the dependence between the answers to the questionnaire items and the identification mark of a respondent (sex, age, education, locality). Based on the obtained *P*-value, a partial hypothesis on the dependence was either accepted or refused. If *P*-value was less than 0.05, then it meant that there existed the dependence between the tested marks. If *P*-value was higher than 0.05, we accepted the null hypothesis which states that there was not dependence between the answer to the question and the locality.

The chi-square statistic, χ², is used to test both null hypotheses "independence" and "homogeneity of proportions". It tests a null hypothesis that the frequency distribution of certain events observed in a sample is consistent with a particular theoretical distribution (Hague 2003, Řezanková 2005). The events considered must be mutually exclusive and have the total probability 1. A common case for this is where the events each cover an outcome of a categorical variable. It is also known as the goodness-of-fit statistic or the

Pearson's goodness-of-fit statistic (Agresti 1990). The test is known as the chi-square test or the goodness-of-fit test. Let the observed cell counts be denoted by {x_{ij}: $i = 1, ..., r$; $j = 1, ..., c$} and the expected cell counts under the model of independence or homogeneity of proportions be denoted by {e_{ij}: $i = 1, ..., r$; $j = 1, ..., c$}. The test statistic is

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(x_{ij} - e_{ij})}{e_{ij}} = \sum_{\text{all cells}} \frac{(\text{observed} - \text{expected})}{\text{expected}}$$

where the expected cell counts are given by

$$\frac{(\text{row total}) \times (\text{column total})}{\text{grand total}}$$

The stated hypothesis was: *"The purchase behaviour of the fruit consumers from the Nitra region depends on the identification marks of those respondents".* This hypothesis should have been either confirmed or refused in accordance with the survey results and the partial results.

RESULTS AND DISCUSSION

The domestic production of the temperate zone fruit and the direct consumption of this kind of fruit in Slovakia are decreasing, however, the share of the domestic temperate zone fruit production is also falling in the direct temperate zone fruit consumption.

In order to change this negative situation and to direct the marketing activities in the appropriate way, consequently resulting in a positive effect for the entrepreneurial entities, it is important to know the potential customer. Therefore, we concentrated our attention on the consumer analysis of the Nitra region, in particular to the temperate zone fruit, the reasons for consumption of the temperate zone fruit and the consumed fruit sorts.

The initial question of the questionnaire survey was "Do you consume the temperate zone fruit?" Out of 255 respondents, 251 answered positively. Their answers to the following questions were studied further. Four respondents claimed that they did not consume the temperate zone fruit at all.

– *Main reasons why you consume fruit*

In the second question, we wanted to find out the main reasons for the fruit consumption. The most frequent answer was the health reasons marked by 84.46% of all respondents. The second most frequent answer was vitamins, indicated by 80.48% respondents. The third reason was the taste (71.71%), which means

Table 1. Main reasons why a respondent consumes fruit

Reasons for consumption	Number of markings	Share (%)	Ranking
Tradition	17	6.77	6
Health	212	84.46	1
Modern trend	1	0.40	8
Digestibility	55	21.91	4
Prevention	35	13.94	5
Vitamins	202	80.48	2
Taste	180	71.71	3
Other reason	2	0.80	7

Source: Questionnaire survey of fruit consumers in the Nitra region – own research (2009)

Table 2. Most frequently consumed fruit sorts in the Nitra region

Fruit sort	Number	%	Ranking
Apples	235	93.63	1
Pears	48	19.12	7
Plums	49	19.52	6
Apricots	74	29.48	4
Peaches	113	45.02	3
Cherries	53	21.12	5
Grapes	167	66.53	2
Other	9	3.59	8

Source: Questionnaire survey of fruit consumers in the Nitra region – own research (2009)

that the respondent eats fruit because of its good taste. These and the following results to the second question have been summarised in the Table 1.

Next, based on the associative analysis, we studied the fact whether there is the statistically evidential dependence between the asked question and some of the studied identification marks (IM) of a respondent.

The partial analysis, which assumed the possible dependence between the second question and the identification marks of a respondent, was not proved.

– *Sort of the temperate zone fruit that you consume most frequently*

Each respondent has his/her favourite fruit that she/he consumes for some reasons. Our assumption that apples are the most frequently consumed sort of fruit in our climatic conditions was confirmed by 93.63% of the respondents. The second most frequently consumed sort of fruit in the Nitra region is grapes indicated by 66.53% of respondents. The next sort is peaches. The precise data and ranking of the consumption of the particular fruit sorts along with the number of markings and the percentage share are given in the Table 2.

No partial hypothesis about the dependence of the answer to the question and the identification mark (sex, age, education, locality) was confirmed.

– *Share of the temperate zone fruit consumption in the total fruit consumption*

The following question was aimed at indicating the share of the consumed temperate zone fruit in the total fruit consumption. The results showed that most respondents (39.44%) consume 50% of temperate zone fruit out of their overall fruit consumption. Fewer respondents (38.25%) stated that the temperate zone fruit created about 75% out of their total fruit consumption. However, 20.72% respondents estimated that out of their overall fruit consumption, one quarter was created by the temperate zone fruit.

The share of the temperate zone fruit consumption in the total fruit consumption, which is related to the analysed sample of respondents, is 53.98%. This fact means that the citrus fruit represent the share of 46.02% in the overall fruit consumption in the Nitra region.

If we compare the results of the questionnaire survey with the official statistics from the Research Institute of Agricultural and Food Economics (RIAFE) related to the consumption of the particular fruit sorts (Table 3), we will find out that the result of our study is similar to the period till the year 2001.

The Table 3 shows that the share of the temperate zone fruit prevailed in the total fruit consumption until 2001. However, the situation has been changed during the following 6 years. The results of consumption in 2006 proved the decrease of the temperate zone fruit consumption and the increase of the tropical fruit consumption in Slovakia. We believe that the results of 2007 tend to the change in favour of the temperate zone fruit consumption in the following years. The official statistics of the fruit consumption in 2007 has not been published yet.

If we make average out the official statistics of the fruit consumption in Slovakia in kg per capita for the period of the last 11 years, we will get the value of 58.2 kg which differs from the recommended dose (96.7 kg per capita a year). The difference is about forty percent (39.81%), i.e. 38.5 kg.

The partial hypotheses about the dependence between the response and the identification mark of a respondent (sex, age, education, locality) were

Table 3. Consumption of the particular fruit sorts in kg per capita in the Slovak Republic

Fruit consumption/years	1999	2000	2001	2002	2003	2004	2005	2006
Fruit together (A)	58.2	56.8	51.3	49.7	52.6	49.7	52.6	54.0
Temperate zone fruit (B)	30.4	30.8	22.3	22.0	23.0	22.8	24.2	22.1
% share (B) in (A)	52.23	54.23	43.47	44.27	43.73	45.88	46.01	40.93
Tropical fruit together	23.9	22.4	25.8	24.9	25.8	23.6	25.2	29.2

Source: RIAFE – Situation and prospective reports: Fruit

Table 4. Consumption of bio fruit depending on education

	Education				
	elementary	vocational	secondary	university	together
Yes	2	3	77	38	120
	0.80%	1.20%	30.68%	15.14%	47.81%
	1.67%	2.50%	64.17%	31.67%	
	66.67%	15.79%	52.74%	45.78%	
No	1	16	69	45	131
	0.40%	6.37%	27.49%	17.93%	52.19%
	0.76%	12.21%	52.67%	34.35%	
	33.33%	84.21%	47.26%	54.22%	
Together	3	19	146	83	251
	1.20%	7.57%	58.17%	33.07%	100.00%

Source: Questionnaire survey of fruit consumers in the Nitra region – own research (2009)

Table 5. Dependence test of the previous bio fruit consumption and education

Test	Statistic	Df	*P*-value
Chi-Squared	9.794	3	0.0204

Source: Questionnaire – own research and calculations (2009), program Statgraphics

not confirmed in this question of the questionnaire survey in any item.

– Consumption of bio fruit in Slovakia

Bio products and their consumption are becoming a new style of a healthy diet of inhabitants predominantly in the developed countries where the demand for these products is the highest. A similar trend is spreading to the other countries, including Slovakia. The bio products require a higher purchasing power of the inhabitants as they are considerably more expensive than the common products.

We wanted to find out how many of our respondents – potential consumers – have already consumed bio fruit and which group of inhabitants is the most interested in this kind of fruit. There is a perspective space in the market for the bio food and bio fruit in Slovakia, when taking into consideration the gradual increase of the living standard in our country. We obtained 47.81% of the positive answers, and 52.19% of respondents have not consumed the bio fruit yet.

The consumption of the bio fruit depends on the level of education of the respondents. This statement is supported by the statistically evidential dependence between the response to the question and the identification mark education. The relation between the partial hypothesis and this statement was confirmed according to the results of the statistics. The test results are given in Tables 4 and 5, and Figure 1.
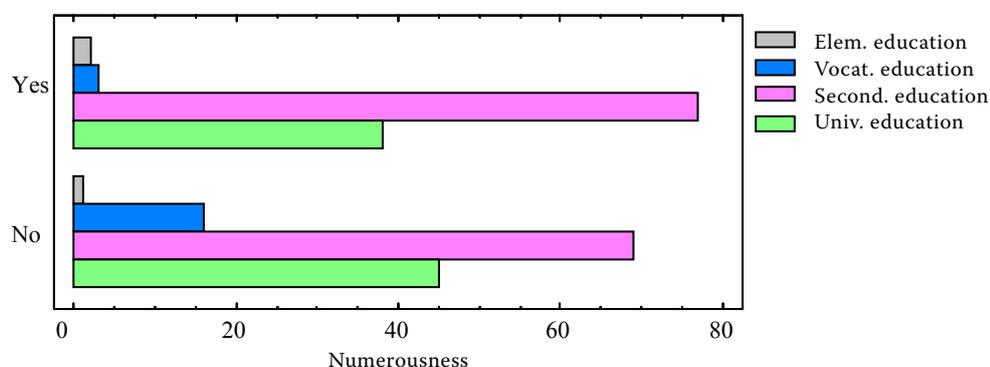

Figure 1. Bio fruit consumption depending on education

Source: Questionnaire – own research (2009), program Statgraphics

The partial hypotheses about the dependence of the response to the question and the identification marks were not confirmed in the other three identification marks (sex, age, locality).

– *Development of fruit consumption of a respondent in the previous years*

Taking into account the officially published data on the fruit consumption – 54.0 kg in 2006 – and its fall during the last decade, we have to think about the existing situation and the future development of the fruit consumption in Slovakia. By this question in the questionnaire survey, we wanted to find out the development of the fruit consumption of the analysed sample in the previous years.

The results show that 50.60% respondents claimed that their fruit consumption stagnated in the previous years. On the other hand, 40.24% answerers said their consumption increased in the previous period. 9.16% of respondents answered that their fruit consumption declined. The conclusion is that the fruit consumption should rise, on condition that the decrease of fruit consumption of 9.16% respondents would not exceed in amount the increase of consumption of 40.24% respondents.

The Table 6 demonstrates the development of the temperate zone fruit consumption depending on the sex of the respondents. According to the published information of the RIAFE, we can notice a slight increase of the fruit consumption in 2002, 2005 and 2006 in comparison with the previous years. The official statistics on the average yearly fruit consumption

in 2007 has not been published yet. However, based on our survey, we can also expect the increase of the fruit consumption in 2007.

According to the associative analysis, we tested the partial hypotheses related to the dependence between the answer to the question and the identification criterion (age, sex, locality and education). Based on this study, we have come to the conclusion that there is the dependence between the development of fruit consumption in the previous years and the sex of the respondents. The results are presented in the Table 7. The following partial hypotheses were not proved.

– *Assumption of fresh fruit consumption in the future*

In this part of the questionnaire survey, we are considering the future development of the fruit consumption in Slovakia. When evaluating the results of the answers to this question, we wanted to analyse the views of the respondents referring to their assumption of the fruit consumption in the future.

66.14% (166) of the respondents would like to consume more fruit than now. The stagnation in the future consumption is assumed by 32.27% (81) of the respondents. They claim that their consumption will not be changed. Only 1.59% of the respondents suppose that their fruit consumption will go down. We also appreciated the consumer's awareness of the fact that s/he does not consume the sufficient amount of fresh fruit. The analysed answers indicated the increase of the fruit consumption in Slovakia. The rise of the fruit consumption approaching the recommended yearly consumption – 96.7 kg per capita – would also influence positively the fruit growing in Slovakia.

Similarly to the development of the fruit consumption, in the assumption of the future consumption, we verified the partial hypotheses and tried to indicate the dependence between the answer to the question and the identification mark which characterises a respondent. In no case the classification of the line and column was dependent.

Table 6. Development of fruit consumption of the respondent in the previous years depending on sex

Consumption development	Woman	Man	Together
Increased	66	35	101
No change	61	66	127
Decreased	16	7	23
Together	143	108	251

Source: Questionnaire survey of fruit consumers in the Nitra region – own research (2009)

Table 7. Dependence test of fruit consumption and sex of the responent

Test	Statistic	Df	*P*-value
Chi-Squared	2.278	2	0.0201

Source: Questionnaire – own research and calculations (2009), program Statgraphic

– *Why should we consume fruit?*

Does the respondent realize the importance of fruit consumption? Which are the main reasons for the fruit consumption of our consumer? We tried to find out to what extend are the responses to the second and tenth questions different and what is the difference if the answers are different at all. We suppose that the existing fruit consumption is related to the tradition and eating habits. In order to increase the consumption considerably, a consumer has to realize mainly the positive effects

Table 8. Main reasons why we should consume fruit

Reason	Number of markings	Share in %	Ranking
Source of vitamins	162	64.54	1
Healthy nutrition	123	49.00	2
Enrichment of menu	13	5.18	6
Innocuous repast	2	0.80	8
Medical prevention	37	14.74	5
Tasty and fast repast	40	15.94	4
Traditional repast	4	1.59	7
Easily digestive and nutritious repast	56	22.31	3
Other reason	0	0	9

Source: Questionnaire survey of fruit consumers in the Nitra region – own research (2009)

of fruit on her/his health. The fruit should become the most important objective of purchase as well as consumption.

The results of the study are given in the Table 8, which confirms the following statements. The majority of respondents, 162 (64.54%), declare that we should consume fruit due to its contain of vitamins. 49.00% of the respondents recommend fruit as healthy nutrition that should have positive effects on our organisms. The third reason marked by the respondents (22.31%) is the easy digestion and nitritiouness of fruit. In comparison with the existing reasons of fruit consumption, the given main reasons why we should consume fruit do not differ fundamentally. The respondent stresses predominantly the health and the reasons closely related to health. S/he neglects the reasons of tradition, habits or a trend in consumption – existing or new, modern. After the main reason – health – for fruit consumption, the next one is taste. In the survey related to the second question – "why we should consume fruit" - taste is rated immediately after the health reasons.

Even in this question, no partial hypothesis about the dependence between the response and the identification marks (sex, age, education, locality) was confirmed.

CONCLUSION

The questionnaire survey and the following identification and analysis of the approaches and behaviour of the Slovak fruit consumer from the Nitra region, targeted particularly at the temperate zone fruit consumption, resulted into the following conclusions:
– The consumer perceives fruit and its consumption in connection with her/his health. Fruit means

predominantly the source of vitamins and only then it is a repast for a consumer.
– At present, the temperate zone fruit represent about 50% share in the total fruit consumption. In the past the temperate zone fruit prevailed in the total fruit consumption, now the situation is being changed towards its detriment.
– The majority of respondents claimed that recently their fruit consumption had stagnated. The positive fact is that they realize they should consume more fruit.

In the part of the paper "Objectives and methods", we stated the hypothesis *"The purchasing behaviour of fruit consumers from the Nitra region depends on the identification marks of these respondents"*. This hypothesis should have been either confirmed or refused according to the survey results and the partial hypotheses.

Based on the results of the associative analyses and the following verification of the partial hypotheses of the particular questionnaire issues, we can note that the main hypothesis was confirmed partially, when accepting some partial hypotheses, i.e. in the following two cases:
– The statistically evidential dependence exists between the bio fruit consumption and the education of the respondents.
– The statistically evidential dependence exists between the development of the fruit consumption in the previous years and the sex of the respondents.

The prospectiveness of the fruit market in Slovakia consists in changing the eating habits and life style of the consumers and also in the fact that the existing domestic consumption per capita is considerably lower in comparison with the EU countries or with the Czech Republic.

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