

Factors Influencing Purchases of Organic Food

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Abstract: *The goal of the article is to describe factors influencing purchases of organic food by consumers in a selected area of the Czech Republic. We have researched and analysed reference books and studies focused on the topic to fulfil the goals of the article. Data acquired during a questionnaire survey with selected consumers was used as primary data. The impact of different factors on the purchase of organic food was researched based on an effect of demographic indicators. Hypotheses were stated to study relations among variables, and we examined the statistical importance and correlation of particular hypotheses. We used another statistical method – a decision tree – to seek connections between the variables. The results show that purchases of organic food are influenced by the price, the taste, the sense of health and the content. The connection between the researched factors and demographic indicators is usually low and statistically insignificant.*

Keywords: Organic food; purchase; environmentally friendly agriculture; factors impacting purchases; taste of organic food

JEL Classification: M30, M31

Introduction

The current environmentally friendly behaviour of society is related to the behaviour of households, their activity as consumers regarding safety in the field of the environment and with the selection and use of products (Peattie, 2010). A report published by the European Commission (2013) states that inhabitants of EU member states consider the health of the environment the main aspect of the decision-making process during purchases of goods.

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Environmentally friendly agriculture is based on a holistic perception of nature, where nature forms a single unit. Environmentally friendly agriculture is trying to secure that a man acts in accordance with nature (Červenka, 2005). This kind of business is not focused on quantity, as is usual, but on quality. Environmentally friendly agriculture follows several rules, such as the protection of the environment, saving in the field of non-renewable resources and the protection of health. Entities involved in environmentally friendly agriculture emphasize biological diversity, prefer renewable resources and recycle particular recyclable material. This kind of agriculture is one of the means for sustainable development, and it is part of the EU single agriculture policy. The importance of environmentally friendly agriculture is currently growing, not just in the world, but also in the Czech Republic. Environmentally friendly agriculture is ruled by the biological cycle: healthy soil – healthy plants – healthy animals – healthy food – healthy people – healthy landscape (Willer and Klicher, 2012; Moudrý, 2002, 2007).

One of the reasons for the development of environmentally friendly agriculture was the gradual industrialisation of the sector and the growth in negative impacts on the environment due to industrialisation. Many unconventional ways of doing business in the field of agriculture started to appear primarily in the region of Western Europe in the 1920's as a reaction to the development of industry. Changes in the way of life and habits of consumers have recently required the need to develop modern marketing procedures based on a market focus in both the field of agriculture and the food industry (European Commission, 2016; Padel, Lampkin, & Foster, 2011). In terms of green consumption it is possible, according to Ajzen (1991), to define approaches focused on the understanding of the motivation of consumers in the field of environmentally friendly agriculture, primarily in three aspects of human behaviour research: a personal approach, subjective standards, and perceived control of behaviour. Arvola et al. (2008) say that several studies from the USA and Europe showed the importance of the intention of consumption in the persuasion of consumers on qualities of organic food, such as taste or healthiness, as well as perceived benefits for the environment. Hidalgo-Baz, Martos-Partal, González-Benito (2017) mention that a growth in knowledge mitigates a difference between stances and purchasing behaviour primarily in terms of consumers focused on the protection of the environment or those with a hedonic inclination. Survey results confirm that knowledge of and focus on the environment influence the harmony between the stances of consumers and their purchasing behaviour. Even the study published by Silva et al (2017) confirms the fact that a positive impact on consumers when perceiving quality brands and rules for the sustainable development came with a growing sensory score and the intention to purchase.

Materials and Methods

Organic food is produced by growing plants and breeding animals in harmony with nature. Neither synthetic pigments nor artificial preservatives are used for the production of organic food (Veber, 2006). The demand for organic food has been growing recently and this results in quick growth of the number of organic food producers. The assortment of organic food on the Czech market is growing, too. Czech consumers can thus choose from a wide offer of domestic organic food, and imports from abroad decrease.

The goal of the article is to describe factors influencing purchases of organic food by consumers in a selected area of the Czech Republic. Both primary and secondary sources were used to gather information to fulfil the article's goals. Secondary information was gathered primarily from reference books and foreign studies. The option to get data on a local level was chosen in order to better update information for an adjustment to requirements in particular areas. It is also possible to show that information from a particular area could inspire also other regions. A collection of primary data with the help of questionnaires was used to determine factors influencing the purchase of organic food.

The article determines researched factors influencing the purchase of organic food, such as demographic ones (age, education and social status) and subjective features of organic food (its taste, healthiness and price). The following hypotheses were stated based on the assumptions:

H1: It is assumed that the price is the determining factor for not purchasing organic food. This fact is not influenced by the age, education or social status of respondents.

H2: It is assumed that the importance of the factors of the "taste" and "healthiness" of organic food does not differ in relation to age and social status.

H3: It is assumed that the importance of the content of organic food for the decision to buy it does not change in relation to the education and age of consumers.

Particular responses were classified based on an analytic sorting. This made it possible to research mutual relations between obtained pieces of information with the help of determining absolute frequencies, correlation and the decision tree. Two applications were used to analyse data – editor Microsoft Excel and software for statistical data analysis IBM SPSS STATISTICS 23. The interpretation of researched data took into consideration that the data originated from respondents' estimations (i.e. the respondents could have defined analysed categories in their own way).

The analysis searched relations among particular researched variables. Association and correlation coefficients were used to seek relations between variables. The coefficients were calculated with help of the application SPSS Statistics. Nominal values were calculated with help of the Cramér's V, while ordinal values were calculated with help of Spearman's rank correlation coefficient. The association coefficient ranges in value from 0 to 1. A value close to zero indicates independence. The

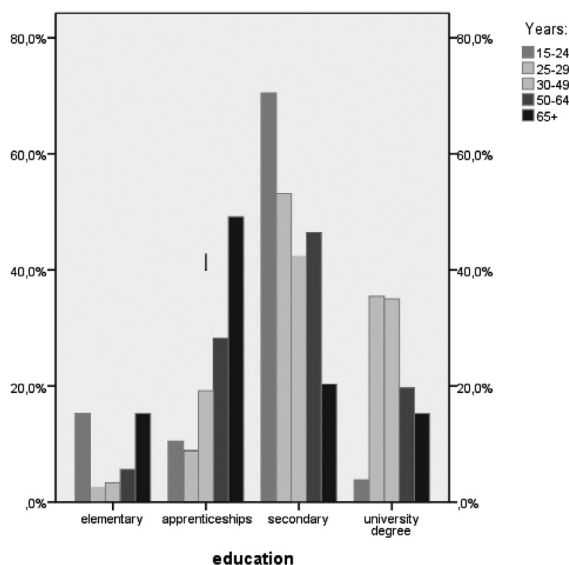
closer the value is to 1, the stronger the relation is between the variables. The rate of correlation ranges from -1 to +1. The closer the value is to +1 or -1, the stronger the relation is between the variables.

A multi-dimensional analysis method, i.e. classification trees, was used to comprehensively explore the data, reveal relations and independently analyse the researched data. Decision trees (Žambochová, 2008 and Grossmanová, a kol., 2016) are being generated with the help of an iterative process. They are recursively generated by the division of predictors' value space. The first hub, a root, contains the entire space of values. Internal hubs of a tree represent data set subsets. The goal of the process is to create homogenous sets in relation to the explanation for a variable. We have used a method implemented in the statistics system SPSS, particularly the CHAID, for our data procession. Trees generated by the algorithm CHAID are not binary and can be divided in an arbitrary number of parts.

Results

The survey was attended by 443 respondents (312 women) divided in segments based on their education and five age categories (Fig. 1) to compare their purchasing behaviour with regard to their age, working status (Tab. 1) and the way their household is maintained.

Figure 1: Structure of respondents based on their education and age (%)



Source: authors

Nearly one half of the respondents live with a partner. Nearly one third of the respondents share a household with their children and one fifth of the respondents are single. Only five respondents live in a retirement home.

Table 1: Structure of respondents based on working status (%)

Working status	%
Student	24
Employee	47
Self-employed	7
Entrepreneur	4
Unemployed	1
Working pensioner	4
Old-age or disabled pensioner	13

Source: authors

One third of the residents learn about environmentally friendly agricultural products primarily in retail chains (40% of women and one fourth of men), 30% learn about them in the media (28% of women and 38% of men), one fifth of the respondents (no differences in gender or education) seek information online and one tenth get information from their friends. The best response at organic food-related marketing events performed by retail chains was registered for respondents with an elementary education (44%), in the age category 30-49 and 50-64 years (40%). A good response was registered also for the same share of employees and respondents living in a household with their children. The media (TV, press, radio) have some effect on 40% of respondents with a secondary education, the age category of 65+ (57%), working pensioners (48%) and nearly three quarters of respondents sharing a household with a partner. The youngest respondents (34%) get information about organic food from the Internet. This applies also to students (29%) and partners in a shared household (23%).

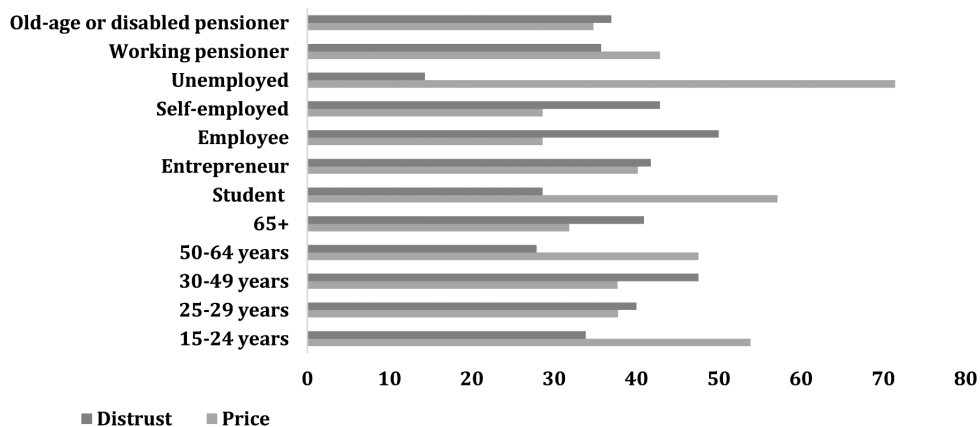
Organic food compared with ordinary food

Two fifths of respondents (44% of women and 31% of men) think organic food differs from ordinary food by being healthier. One third of respondents (29% of women, 41% of men) see the difference in the price, while 14% (15% of women, 11% of men) think the taste is different. Nearly one half of respondents with an elementary education think organic food is healthier. This idea is shared by 43% of respondents with a university degree, 46% of respondents aged 30-49 years, 43% of respondents aged 15-24 years, nearly one half of students, and 45% of respondents sharing a household with their children. The higher price of organic food is the main feature making the difference for 42% of respondents aged 50-64 years and 37% of singles among the respondents.

A total of 62% of respondents do not buy organic food due to its high price (43%) and mistrust (37% of respondents with no difference in the way of living). Some 16% of respondents plant their own fruit and vegetables. Mistrust towards organic food grows in relation with the achieved level of education (22% of respondents with an elementary education and 43% of respondents with a university degree), while the importance of the price decreases (52% of respondents with an elementary education and 39% of respondents with a university degree). The price is the main reason to reject organic food for 45% of singles among the respondents. The structure of respondents not buying organic food due to its high price or the mistrust based on their age and social status is shown in Fig. 2.

The association and correlation test was used to find out if the price as a factor not to buy organic food was influenced either by the age, education or the social status of the respondents. A low value of the correlation coefficient Age (0.161) and Social status (0.28) was found between the importance of the price and demographic indicators. The correlation in terms of education is low, however indirect (-0.051). This means that the sensitivity to the price of the organic food decreases with a higher level of education. The researched correlations are, however, statistically insignificant for all three demographic indicators (the significance is above 0.05). It is supposed that the selected demographic indicators do not impact the decision to buy organic food due to its price.

Figure 2: The structure of respondents rejecting organic food (%)



Source: authors

Factors influencing purchases of organic food

More than one half of consumers buying organic food buy it because it is healthy – 58% of women, 47% of men. Some 17% of respondents prefer organic food because it tastes better, 14% of respondents think it does not harm the environment and 12% are curious. The lowest emphasis on the content of organic food was recorded for respondents with a university degree (48%), respondents aged 30-49 years (31 %), the self-employed (41%) and one third of singles. The taste of organic food is preferred by one fifth of respondents with a university degree, the same percentage of consumers aged 26-64 years, 30% of self-employed people and entrepreneurs, and more than one fourth of singles. On the other hand, the taste of organic food is preferred only by 14% of respondents living in a shared household, one tenth of students, 14% of working pensioners, and 5% of respondents aged 65+. Environmental aspects of organic food production are the main reason for the purchase primarily for consumers with a higher level of education (15%), self-employed people and working pensioners (29% each). On the other hand, such an aspect matters neither to respondents with an elementary education nor to old age or disabled pensioners.

A correlation coefficient was used to investigate if there was any statistically significant relation between demographic variables and factors influencing purchases of organic food (see tab. 2). The value of the correlation coefficient is low for the researched factors. There is a direct correlation between the age and factors influencing purchases of organic food (except for the factor “curiosity”), however, it is very weak. The researched reliance is statistically insignificant for the indicator. In terms of “education”, it is possible to see an indirect relation among the researched factors (except for the variable “healthiness”). It means that the influence of the taste of organic food, the environmental aspect of organic production and curiosity for the purchase of organic food decreases with a growing level of education. On the other hand, the importance of the aspect “healthiness” grows with a growing level of education. The correlation between the age and the factor “taste” is statistically significant, while the rest of the correlations are statistically insignificant.

A low direct correlation with a statistical insignificance can be seen among other researched demographic indicators and the factors influencing purchases of organic food.

Table 2: Correlation relations among researched indicators

Correlations						
variables			taste	healthy	Does not harm the environment	curiosity
Spearman's,	age	Correlation Coefficient	.072	.087	.061	-.016
		Sig. (2-tailed)	.129	.068	.202	.729
		N	444	444	444	444
	education	Correlation Coefficient	-.120*	.077	-.057	-.068
		Sig. (2-tailed)	.013	.109	.239	.158
		N	444	444	444	444
Cramer's	Social status	Correlation Coefficient	.181	.104	.093	.065
		Sig. (2-tailed)	.250	.575	.694	.931
		N	444	444	444	444
	household	Correlation Coefficient	.087	.091	.065	.067
		Sig. (2-tailed)	.346	.299	.603	.581
		N	444	444	444	444

Correlation is significant at the 0.05 level (2-tailed).

Source: Authors

Importance of factors in the choice to buy organic food

Nearly one half of respondents emphasize the content when selecting organic food (54% of women, 35% of men), some 22% of respondents prefer taste (21% of women, one fourth of men), 13% prefer the price (one tenth of women and one fifth of men) and 12% reviews from their friends and relatives (no difference in gender). Only 3% of respondents emphasize the package when choosing to buy organic food. Brands do not play a role in the decision-making process for respondents.

The content of organic food motivates purchases primarily for students (60%), one half of entrepreneurs and old-age and disability pensioners, 47% of employees and more than one half of respondents living in a shared household with their children. The interest in the content of organic food grows with education (45% elementary education – 55% respondents with a university degree), however, the overall correlation is low (0.119). The statistical significance of the value is 0.000392, and this confirms the existence of a relation between the growing level of education and the importance of interest in the content of organic food.

On the other hand, the importance of interest in the content of organic food decreases in relation with a growing age (56% in the youngest category, 40% in the category of the oldest respondents). This statement is also supported in a statistical way – there is a direct correlation (0.150) among the researched variables and it is statistically significant on the level of significance $p = 0.01$.

Primarily the taste of organic food influences the decision to buy it for one third of consumers with a secondary education, two fifths of respondents aged 50-64 years, one

fourth of self-employers, and 38% of singles. The overall correlation between the taste of organic food and researched demographic indicators – age (0.06), education (0.04), working status (0.09) and social status (0.109) – is very low. The hypothesis of the existence of a correlation between demographic indicators and the taste of organic food was not proved, because the statistical significance of the values was higher than 0.05.

The price is the most important factor influencing the purchase of products of environmentally friendly agriculture for one third of consumers aged 50-64 years and for working pensioners. The correlation between the price and education is very low (0.010) with a statistical significance ($p = 0.839$). The researched correlation between the age and price is -0.035 (statistical significance $p = 0.457$), which means that the importance of the price as a factor influencing purchases of organic food decreases with growing age. The importance of the coefficient was not confirmed in either researched correlations.

Recommendations to buy organic food are important for one fifth of organic food consumers with a secondary education, 16% of respondents aged 25-49 years, and one fifth of self-employers, entrepreneurs and working pensioners. On the other hand, recommendations are not important for the youngest consumers (15-24 years) or respondents aged 50-64 years, students and old-age and disability pensioners.

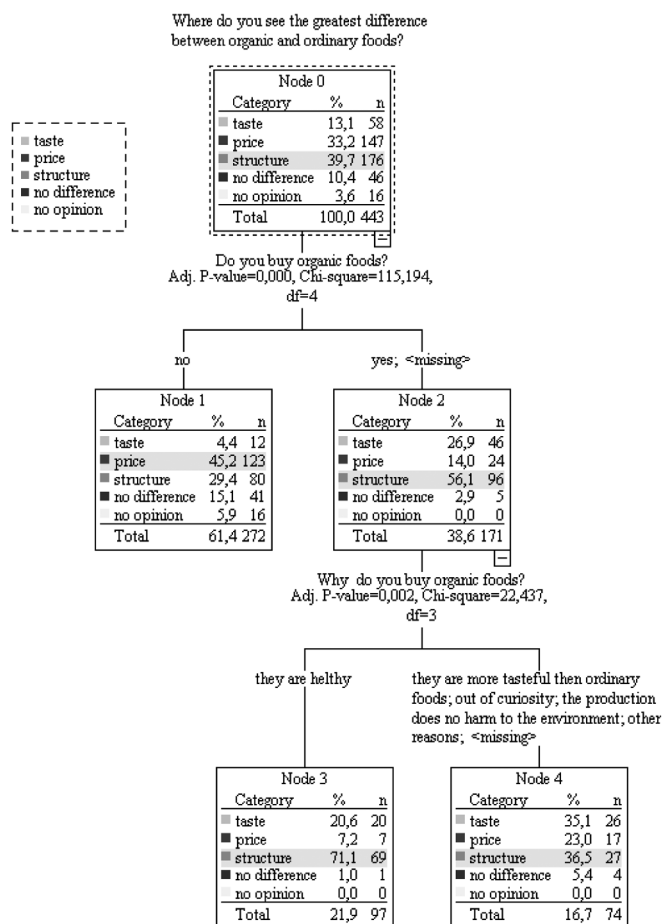
Use of decision tree to analyse the perception of organic food

The decision tree model using the algorithm CHAID was used to determine which variable had the strongest impact on the perception of organic food. A total of 85% of cases were correctly classified in the model, which means that the error rate reaches 15%. Characteristics of the perception of differences between organic and non-organic food were defined as dependent variables. Respondents were classified in particular groups based on independent variables – gender (man/woman), purchases of organic food (yes/no); age, education and reasons why people buy particular kinds of organic food.

The act of the purchase of relevant kinds of organic food was the main predictor for the perception of the difference between organic food and ordinary food. Respondents buying organic food perceive its difference compared with ordinary food in the aspect of healthiness (56%) and taste (27%). Only 14% of respondents said the price was an important aspect of the difference. On the other hand, respondents not buying organic food mentioned that the price was an important aspect for the difference between organic food and ordinary food (45%) and that organic food was healthier (29%). This was the only predictor for those not buying organic food. The reason for buying organic food was another important predictor for those buying organic food. Respondents were divided in two groups based on that. The first group buys organic food based on the conviction that it was healthy. This group perceives the difference of organic food in its content (71%). The remaining defined differences (taste, prices) are negligible.

The second group buys organic food primarily due its different taste and the fact that its production does not harm the environment. This group thinks the difference compared with ordinary food is the healthiness (36%), taste (35%), and also the price (23%). Fig. 3 shows that consumers perceive the difference of organic food in their health. The price is an important predictor for those not buying organic food. Those buying organic food emphasize health and taste. It is interesting that respondents mentioning that they were buying organic food based on its content think that the healthiness was an important predictor for the difference in the perception of organic food. Consumers buying organic food based on its taste and relation to nature mentioned more predictors for their perception of the difference of the organic food compared with ordinary food – healthiness, taste, and price.

Figure 3: Perception of organic products with help of decision tree



Source: Authors

Discussion

Products provided by environmentally friendly agriculture have become an inseparable part of the market. Some consumers prefer them, and the market reacts by the extension of its assortment. Factors influencing the demand and their impact could differ in particular countries. Ranaa and Paulb (2017) have concluded in their study based on collected data that ethical commitments, quality, safety, knowledge, and health were important factors in the case of developed countries, while important factors for developing countries include the availability, education, health status, marital status and the size of a family. The factor of health surprisingly can be found important in both kinds of countries. Anja Kollmuss and Julian Agyeman (2010) analyse factors impacting (either negatively or positively) on environmental behaviour. This includes demographic factors, external factors (institutional, economic, cultural and social ones) and internal factors (such as knowledge, awareness, stances, values, point of control, emotions, responsibility, and priorities).

Our paper has researched the demand for organic food in terms of the impact of selected demographic factors – i.e. age, education, social status and working status.

Purchases of organic food in the Czech Republic have been gradually growing since 2011. The total turnover in the trade with organic food produced by Czech entities (including exports) increased 17% y/y to CZK 3.73bn in 2015 (Organic Farming in the Czech Republic, 2015). Hurdles for purchases of organic food are usually related to higher prices and lower availability (Robinson & Smith, 2002). This finding was confirmed also by research conducted by the Ministry of Agriculture of the Czech Republic in the years 2008 and 2010 (Šmajš, Binka, Rolný, 2012). Results of a study published by Lee and Hwang (2016) indicate that while the high price of organic food could reduce the perceived value, the focus on achieving the quality of such food could encourage consumers to increase their purchases.

Our research also indicates that the price is one of the most important factors for not buying organic food. The researched correlation between the price and demographic factors (age, social status, working status) is low and statistically insignificant. This means that Hypothesis no. 1 was confirmed, i.e. the selected demographic indicators do not have an effect on not buying the organic food due to its price.

Some foreign papers point out that primary factors influencing environmentally friendly consumption include primarily consumers' individual impressions, such as products' nutrition advantages, their taste, and no use of pesticides or chemical treatment of soil. Buying organic food also means a social differentiation from "traditional" consumers (Johnston, 2008, Johnston et al., 2011). Research conducted by Leire and Thidell (2005) confirms the fact that consumers emphasize more their environmentally friendly purchases.

Authors Shrank and Running (2016) state that 70% of addressed respondents emphasize the same both collective and individual motives for purchasing organic

food. According to the authors, individual motives include the quality (taste, healthiness, freshness), symbolic motives (nostalgia, genuineness, and regional character), while collective motives include environmental aspects (environmentally friendly agriculture, sustainability and chemical reduction of soil and water) and economic motives (support for local economies, transparency and interpersonal markets). On the other hand, a regression analysis in the study Chen (2007) proved that the motive of the selection of healthy food does not contribute to consumers' positive approach to organic food, however, the protection of the environment does.

Our research has proved that the most important factors of the influence on purchases of organic food include the impression that the organic food is healthy, its taste and the significance for the environment. The researched correlation between the above-mentioned factors and demographic characteristics is low and statistically insignificant with an exception of the researched correlation between age and the taste of organic food. This means that the Hypothesis no. 2 was proved only partially. The importance of the factor of taste is changing in relation to the age of consumers. The importance of factors, such as taste, an impression that organic food is healthier and better for the environment, for purchases of organic food was confirmed also by studies published by Bryla (2016) and Singh, Verma, (2017).

Consumers buying organic food prefer the content of the food to the price and the taste. We have researched the correlation between the importance of factors for the purchase of organic food and demographic indicators. Both correlation and association tests have not proved the assumption of the influence of nominal values on purchases of organic food. It is thus possible to reject Hypothesis no. 3. Studies by Aschemann-Witzela et al. (2013) and Hsiao-Ching et al. (2017) also state that the content of organic food was the main parameter for consumers. The content then influences also the demand for organic food.

Conclusion

The current generation is not very interested in uselessly spending time on the preparation of a more difficult meal. Customers require quality and a broader assortment of semi-prepared food and new, interesting products. So-called "healthy nutrition" is being emphasized in connection with the impression of togetherness and consideration for the environment. Consumers can thus co-decide on the extent of the production of food and the structure of manufacturers, while farmers are responsible for their products. Quality remains the basic requirement in the trade with food, while requirements for the quality of the production process saving the environment are growing as well as requirements for the quality of the production itself.

The market with organic food offers great potential, because the number of people interested in the matter is still growing. The Czech Republic is an emerging mar-

ket for organic food, and it is possible to expect some growth in the demand, similar to the growth recorded in the rest of the European countries.

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