

# Consumers' perception of the health aspects of organic food

OLGA KUTNOHORSKÁ<sup>1</sup>, PAVEL TOMŠÍK<sup>2</sup>

<sup>1</sup>*Institute of Chemical Technology, Prague, Czech Republic*

<sup>2</sup>*University of Economics and Management, Prague, Czech Republic*

**Abstract:** Organic foods are grown using the principles of organic agriculture that are produced, processed and packaged without using chemicals. They have been accepted due to their several perceived benefits over the conventional food. Health aspects of organic food are, in addition to the ethical, environmental, hedonic and “feel good” aspects, the main benefits that the consumers appreciate in organic food. This paper presents the results of a quantitative survey in the Czech organic food market. By using the factor analysis, it showed that the consumer perception of the health benefits of organic food can be viewed from several different angles. There were found three factors that explain 58.42% of variability, which are, based on their relationship with the original items, interpreted as the “knowledge and responsibility”, “being aware, but lax” and “health is important, but not related to food”. The first factor contains enough knowledge related to the health care, the conviction of the importance of food choice regarding health and the active interest and effort to do something for one’s health. The second factor contains enough knowledge related to health care, but is lacking the interest to apply the knowledge and to do something for one’s health, and the third factor contains the conviction that health is an important asset, but the perception of the connection between one’s health and food is absent.

**Key words:** consumer behaviour, factor analysis, marketing mix, quantitative research

The main goal of the paper is to survey the consumers' attitude to their health, to find out if there is a connection between their health and eating habits in their mind and to identify the health factors influencing consumers' behaviour in the Czech organic food market.

According to the Act No. 242/2000, Coll., “organic food is food produced according to the regulations stated in this Law and the regulations of the European Communities, fulfilling the requirements of the quality and health safety specified in special laws” (Act No. 242/2000). Organic food or product is grown using the principles of organic agriculture, which means without using artificial fertilizers, harmful chemical sprays or genetically modified organisms. No artificial fertilizers, additives (e.g. antibiotics or synthetic hormones) or other substances of the non-natural origin or damaging the environment can be used in the production of organic food. Also, breeding of domestic animals in stanchion barns or cages is prohibited as a rule of the organic food production. Organic farming is not only better for the animals, it is also better for the environment. It means that the main principle of organic farming is not the most intensive use of resources, but rather their protection and environment-friendly use which lead to sustainability.

The dynamics of the Czech organic food market imitate the growing trend of the markets in the West European countries and the USA (Onyango et al. 2007); the majority of sales represent cereals (crop production) and beef (livestock) (Václavík 2008). Despite the fact that organic food still constitutes a relatively small portion of the food market (Raynolds 2000), thanks to the growing interest of customers, the previously small niche of the market changes over time into a significant segment and the marketing principles are increasingly taken into consideration. Quests to find a detailed knowledge of customers and their behaviour and to identify the appropriate segments are obvious. Every person is an individual and he/she is determined by certain predispositions that lead him/her to a specific purchasing and consumer behaviour. The key application of the effective marketing approach to this market by the firms is primarily a sufficient knowledge of the customers' shopping behaviour, the identification of factors which determine and reflect this behaviour to design a suitable combination of instruments of the marketing mix.

There are obvious efforts to describe the customer behaviour in detail.

The main barriers hindering a more massive spread of organic food throughout the market are still its very high price, a limited availability, customers'

satisfaction with the offer of conventional food, the lack of trust and, last but not least, the lack of the perceived value (Zakowska-Biemans 2011).

For example, according to the research prepared for the Czech market in 2008 by the PRO-BIO LIGA, the average price difference between the organic and conventional foods was assessed in all stores at approximately 95% ([www.biospotrebitel.cz](http://www.biospotrebitel.cz)). Also, according to the regular monitoring of the prices of organic food ([www.bio-info.cz](http://www.bio-info.cz)), the prices of organic food have been steadily moving from tens to hundreds (especially in animal products) per cents above the price of the conventional food. There are many reasons why organic food is more expensive than the conventional food. Organic farmers achieve lower crop yields and reduced livestock gains, because they do not focus on maximizing the production, but on its quality. Also the purchase prices of organic products are higher than the prices of conventional production and organic food is produced in smaller amounts than the conventional. All these aspects are reflected in the final increase of the prices of the final products.

As shown in the studies (Loureiro and Hine 2001; Wang and Sun 2003), consumers who prefer organic food, local food and GMO-free foods are aware of the higher prices of these products, however, they are willing to pay a premium price.

Among the frequently mentioned obstacles to a more massive expansion of organic food among consumers is also the poor availability of these products (GfK Research Report 2006). In particular, seasonal problems and the failure to ensure the delivery of a predetermined amount and the limited assortment of goods prevent their introduction into the current range of the retail chains.

At present, the sales of organic food are divided into the following distribution channels:

- (1) Direct distribution channel – farms and specialized marketplaces (e.g. farmers markets).
- (2) Grocery stores (hypermarkets, supermarkets).
- (3) Special health food stores, pharmacies.
- (4) Internet shops.

The structure of the distribution channels in the Czech Republic is currently already very similar to the situation abroad.

Several explanations for the question why the customers buy and consume organic food can be found throughout the literature. In spite of the situation being different from country to country, mainly because of the different level of the organic food market development, there are plenty of characteristics related to the buying motivation, attitude and demographical characteristics which are common for all consumers.

The consumption of organic food is a part of lifestyle, the ideology based on a specific value ladder, which influences the personal attitude and behaviour of customers (Schifferstein and Oude Ophuis 1998). The most frequent motives for buying organic food are the organic food safety and its positive effects on health (Davies et al. 1995; Schifferstein and Oude Ophuis 1998; Michelsen et al. 1999; Harper and Makatouni 2002; Zanolli and Naspetti 2002; Toorjusen 2011), as an important aspect of the customer perception were identified the environmental (return to nature, ecological feeling) and ethical attributes of organic food and its manufacturing processes (the help to endangered regions, a direct support of local farmers, Fair Trade, the preservation of traditional countryside lifestyle and animal welfare) (Harper and Makatouni 2002; Zanolli and Naspetti 2002; Codron et al. 2006; Toorjusen 2011). Important factors influencing the customer decision for buying organic food are also its sensory and organoleptic attributes (size, colour, shape, flavour, scent or “feeling”). Customers also value the good taste of organic food (Wandel and Bugge 1997; Zanolli and Naspetti 2002; Midmore et al. 2005). The so-called “Feel Good” aspects, bound to the social status of the consumer, reflect the desire to achieve a sort of exclusivity or (in less frequent cases) an impersonation of a specific type of consumers (Midmore et al. 2005).

## MATERIAL AND METHODS

The method of the quantitative market research, specifically the method of the personal and electronic questionnaire was used to obtain the needed data. The research took place between May and September 2011, a total of 451 respondents have filled the questionnaire. Personal experience with the purchase and consumption of organic food was the main criterion for adding the respondent to the database. The level of the experience was assessed by the frequency of the organic food purchase; those respondents who stated no experience with the purchase were excluded. Further, no less important factor was the interest of the respondents in the topic and their willingness to submit the desired information. The localities appropriate for the choice of respondents were chosen based on the secondary data analysis. The respondents were questioned in the place of the organic food sale, with the inclusion of all the main distribution channels (specialized health food stores, organic farms with its own sales, retailer chains with the organic food range, internet stores selling organic food and the “bio-boxes”).

## The structure of the sample

The structure of the sample corresponds to the characteristics, stated for the random selection of organic food consumers in the studies carried out in the Czech market (BIO-Výzkumná zpráva, Ogilvy 2008).

There were more women (78%) than men (22%) in the sample; this fact is due to the fundamental role of women in the selection and purchase of foodstuffs for the household. The majority of the respondents (88%) is aged up to 44 years (of which 43% up to 29 years and 45% between 30 and 44 years), in the category of 45 to 59 years, there were 10% of the respondents, and the remaining 3% are over 60.

Regarding the education level, the majority of respondents are the tertiary level graduates (58%), followed by the secondary school graduates (37%), only 4% are of the lower professional education level and just 2% have the primary level of education. The high proportion of the tertiary education graduates corresponds with the findings from other researches (the higher the education, the more willingness to buy organic products).

Regarding occupation, the majority of the respondents are the "white collars" (56%) working mainly as clerks, teachers, scientists, followed by students (tertiary level) (19%). 14% of the respondents claimed having been on the maternity leave recently. Only 5% is represented by the "blue collars", 3% are self-employed or unemployed, 2% retired and 1% are secondary school students.

The distribution of family income is quite regular with the following levels – less than 15 000 CZK (18%), less than 25 000 CZK (23%), less than 35 000 CZK (25%), less than 45 000 CZK (16%) and more than 45 000 CZK (18%).

As an important part of the respondents characteristics, there was marked the amount spent by the households for organic food monthly. The lowest level (up to 500 CZK) is reported by the majority of respondents (34%), followed by 27% of those spending between 501 and 1000 CZK. Spending between 1000 and 1500 CZK were 15%, and between 1500 and 2000 CZK 10% of respondents. Unexpectedly high is the share of those spending more than 2001 CZK (13%).

Other characteristic with the impact on the results is the number of children living in the household. The majority of respondents in our research report no children up to 15 years (67%); one child is reported by 17% of the respondents, two children by 13% and three children by 3%. Only one respondent reported having 4 children.

The number of inhabitants in the household reported is as follows 2, 4, 3, 1, 5, 6, and 8 with the

relevant percentage 30%, 23%, 22%, 19%, 6%, 0% and 0%, respectively. This statistics is not in accordance with the previously mentioned number of children in the household, however, the explanation is quite simple as in many families, there are children older than 15 years, but those were judged as adults as in the majority of cases they decide by themselves what to buy and eat.

70% of the respondents live in a flat, while 30% reported living in a house. This distribution is closely linked to the last characteristic representing the size of the residence. The majority (73%) reported living in a town with more than 100 000 inhabitants, only 12% stay in a small town or a village with less than 5000 inhabitants, the remaining 14% belong to residences between 5000 and 100 000 inhabitants.

## RESULTS AND DISCUSSION

Regarding the aforementioned aspects of the organic food perception and purchase, 12 range questions were included in the questionnaire. All questions relate to the theme of health. Health aspects are ones of the most frequently mentioned reasons for changing eating habits in general, and it can therefore be expected that they could significantly influence the consumers of organic food. The questions are oriented at three directions. First, they try to capture the views on whether the health reasons are regarded as important in general and to what extent they may affect an individual or which role in decision is played by the recommendations of others (neighbourhood, nutrition counsellors, etc.). They are also aimed at exploring the willingness to do something for one's health, changing eating habits in order to positively influence human health. And finally, they try to clarify what is the concrete behaviour regarding alimentation in relation to health. The questions were based on similar researches dealing with the consumer behaviour in the abroad organic food markets (Schifferstein and Oude Ophuis 1998; Magnusson et al. 2003; Chen 2007) and they were modified to the conditions in the Czech market (Table 1).

Considering the following use of the answers as an input of segmentation, an even number of variants in the range was chosen (Wedel and Kamakura 2000; McDonald and Dunbar 2009). The range for questions 1–10 was Strongly disagree – Disagree – Agree – Strongly Agree, and for questions 11 and 12 Completely unimportant – Unimportant – Important – Highly important.

This set of questions was then processed using the factor analysis. Factor analysis is based on the

Table 1. Questions 1–12

Variable	Text
O1	I feel I sacrifice a lot to my health
O2	I try to eat healthy food
O3	I pay a lot of attention to my health
O4	I think it is important to know how to eat healthily
O5	I think I know a lot about healthy food
O6	I think my health is influenced by my eating habits
O7	My health is of great value to me
O8	I frequently do things good for my health
O9	Commonly I choose that food, which I think is healthy
O10	I am willing to change something now to keep my health in the future
O11	How important are the health aspects for your food choice?
O12	How important is your health when compared to other aspects of your life?

Source: Authors (2012)

statistical model which describes every monitored variable as a linear combination of factors we need to find out and identify their importance (Brabenec and Nešetřilová 2007). The relationship between the given variable and factor is defined as the load factor. Load factors represent the unknown parameters of the model and the basic task of the factor analysis is their assessment, preferably in the form of correlation coefficients between the original variables and the found factors. Load factors are the main tool when interpreting the factors (Pecáková 2011).

Table 2. Factor loadings of factors

Variable	Text	Factor 1	Factor 2	Factor 3
O1	I feel I sacrifice a lot to my health	0.790	-0.033	0.051
O2	I try to eat healthy food	0.590	0.344	0.207
O3	I pay a lot of attention to my health	0.777	0.068	0.158
O4	I think it is important to know how to eat healthily	0.089	0.705	0.258
O5	I think I know a lot about healthy food	0.299	0.730	-0.062
O6	I think my health is influenced by my eating habits	0.076	0.610	0.363
O7	My health is of great value to me	0.148	0.297	0.766
O8	I frequently do things good for my health	0.696	0.261	0.228
O9	Commonly I choose that food, which I think is healthy	0.583	0.500	0.050
O10	I am willing to change something now to keep my health in the future	0.486	0.218	0.430
O11	How important are the health aspects in your food choice?	0.611	0.295	0.191
O12	How important is your health when compared to other aspects of your life?	0.211	0.031	0.793

Source: Authors (2012)

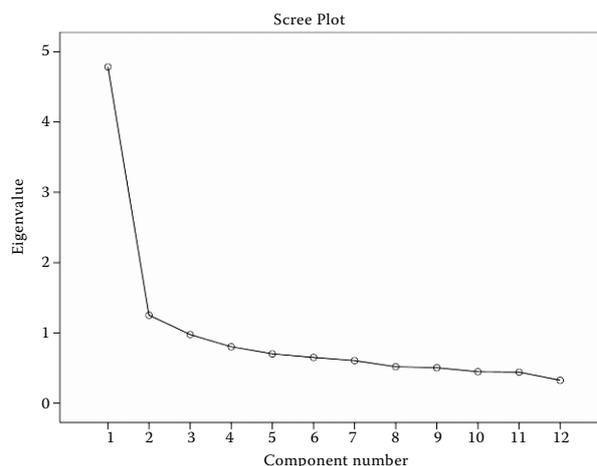


Figure 1. Factor importance

Source: Authors (2012)

Among the important results, there belong the factor scores, which are calculated for each respondent and determine the value of each factor. Commonly, they are added as new variables to the data matrix and are used for the further analysis.

In the framework of solution, it is necessary to determine the number of factors. Several methods of approach can be used while determining the optimal number of factors. One of such methods is the use of the Kaiser’s rule (this is used in the majority of statistical software including the SPSS). In such case, the number of factors is determined automatically as the count of the eigenvalue of the model correlation matrix greater than 1. Each individual number represents one factor and it is proportional to the percentage of variability described by this factor. Other factors with the eigenvalue of less than 1 do

Table 3. Factor loadings of the Factor 1

Variable	Text	Factor loadings of the Factor 1
O1	I feel I sacrifice a lot to my health	0.790
O2	I try to eat healthy food	0.590
O3	I pay a lot of attention to my health	0.777
O8	I frequently do things good for my health	0.696
O9	Commonly I choose that food, which I think is healthy	0.583
O11	How important are the health aspects in your food choice?	0.611

Source: Authors (2012)

not need to be taken into account because of the fact that they are no better than the original variable (each variable's variance equals 1 thanks to the standardization), and therefore it is better to use the original variable (Aaker et al. 2004). Eigenvalues of the matrix are for a better illustration set into a graph gradually by their correspondence to the possible factors (axis "Eigenvalue"); the shape of the Figure 1 can be also used when determining the number of factors. Other possibility to determine the number of factors is based on the highest percentage of determination of the original variables. Third option, which is not based on a completely unambiguous and therefore not appropriate mathematical apparatus, is the determination of factors based on the ability of their meaningful interpretation (Červová 2009).

At first, in spite of all the effort, it is usually not possible to reasonably interpret the resulting solution given by the factor analysis. The obtained factors can be geometrically presented as vectors in the coordinate system, which may not be optimal. To improve the possibility of the factor interpretation, a rotation of factors is used, that means such transformation of the initial solution, where the relations between the factors and variables are the strongest, i.e. where the load factors are close to either one or zero.

The greatest limitation of the factor analysis is that is a highly subjective process. The determination of the numbers of factors and their interpretation involve a subjective judgment (Aaker et al. 2003).

The analysis was carried out in the IBM SPSS Statistic 17 software using the procedure Analyse Dimension Reduction – Factor Analysis.

For the extraction of factors, the main component method was used, the calculation being based on the correlation matrix and the method Varimax produced the best results for the factor rotation. The regression estimate method was used for the estimation of the factor scores.

The analysis showed that the perception of health aspects, which constitutes one of the most important motivating factors for the purchase and consumption of organic food (Magnusson et al. 2003), is not homogeneous. Based on the research of Czech consumers of organic food, there have been revealed several factors that form the perception of the aspects related to the impact of the products on human health.

The results of the analysis are presented in the following text. Three factors describing 58.42% of the variability were found.

The load factors obtained from the rotated matrix, which were used for the interpretation of the factors, are given in the following text. The input variables, which represent the factors, were selected on the basis of their factor loadings and the judgment as to their usefulness and validity. An overview of the obtained factors is shown in Table 2.

The strongest factor (Factor 1) aggregates into the same class six variables which are positively correlated (Table 3).

Considering the factor structure, Factor 1 can be interpreted as the "knowledge and responsibility". This factor contains enough knowledge related to health care, the conviction of the importance of food choice regarding health and an active interest and effort to do something for one's health.

Table 4. Factor loadings of the Factor 2

Variable	Text	Factor loadings of the Factor 2
O4	I think it is important to know how to eat healthily	0.705
O5	I think I know a lot about healthy food	0.730
O6	I think my health is influenced by my eating habits	0.610
O9	Commonly I choose that food, which I think is healthy	0.500

Source: Authors (2012)

Table 5. Factor loadings of the Factor 3

Variable	Text	Factor loadings of the Factor 3
O7	My health is of great value to me	0.766
O10	I am willing to change something now to keep my health in the future	0.430
O12	How important is your health when compared to other aspects of your life?	0.793

Source: Authors (2012)

The second strongest factor, Factor 2, aggregates into the same class four variables which are positively correlated (Table 4).

Factor 2 can be accordingly interpreted as “being aware but lax”. This factor contains enough knowledge related to health care, but lacking the interest to apply this knowledge and do something for one’s health.

The last factor, Factor 3, associates three variables which are positively correlated (Table 5).

Factor 3 can be described as “Health is important, but not connected to food”. This factor contains the conviction that health is an important asset, but the connection between health and food is absent.

## CONCLUSIONS

The present development in the food market indicates that organic food became one of the important parts of the market. The companies try to explore the consumers’ behaviour to prepare tempting offers for them. The health benefits represent one of the most often mentioned benefits of organic food all over the world. The results of the Czech organic food market have shown that, similar to the other countries, Czech consumers emphasizes the health benefits, which the consumption of organic food brings.

A completely new conclusion is finding the various factors associated with the perception of the health aspects of organic food. The health aspects are usually viewed from the point corresponding to the identified Factor 1, the studies represent consumers of organic food as the consumers who are aware of the importance of their health, combine their health with the food they eat, they have a considerable knowledge about the issues related to health and accept the responsibility for their health. However, the research has shown that the health aspects group can be divided into three independent factors using the factor analysis. The first factor is connected to the knowledge of health care, its active implementation, and the belief that there is a connection between food and health. The second factor comprises the knowledge of health care, but it lacks the will to apply it in the real life. The third factor comprises the perception of health

as being important, but there is not any connection between human health and food.

Based on these findings, it is possible to say that the organic food market consumers actually show different attitudes, beliefs and behaviour in relation to health care. Most consumers perceive their health as an important part of their life and they regard organic food as a rather healthier than the conventional food. There are consumers who not only perceive the relationship between their health and eating habits, but who also have a sufficient knowledge needed to be able to eat healthily, and to know how to actually implement this to their meals, not only by eating the organic food. By contrast, in this market, however, there are consumers who do not agree with the claim that the diet and health are linked, they have no knowledge about healthy eating and they think that such knowledge is not important. Between these two extremes, there are moving the consumers who vary in their attitudes, beliefs and behaviours to different degrees between these extremes.

## REFERENCES

- Aaker D.A., Kumar V., Day G.S. (2003): *Marketing Research*. John Wiley and Sons, Inc., New York.
- Act 242/2000 Coll., On organic farming (2000). (Zákon 242/2000 Sb., O ekologickém zemědělství.) Available at <http://www.szpi.gov.cz/docDetail.aspx?docid=1007838&docType=ART&nid=11816>
- BIO-výzkumná zpráva: Ogilvy (2008). (BIO-Research Report: Ogilvy.) Available at <http://www.bio-info.cz/bio-akademie/povedomi-a-nakupni-chovani-spotrebitelu-v-oblasti> (accessed 15.10.2009).
- Brabenec V., Nešetřilová H. (2007): On application of the factor analysis in the agricultural research. *Agricultural Economics – Czech*, 53: 441–447.
- Červová L. (2009): *SPSS Base: Příkazy a možnosti*. (SPSS Base: Commands and Options.) Centrum výuky SPSS, Praha.
- Chen M.-F. (2007): Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality trans. *Food Quality and Preference*, 18: 1008–1021.

- Codron J.-M., Siriex L., Reardon T. (2006): Social and environmental attributes of food products in an emerging mass market: Challenges of signaling and consumer perception, with European illustrations. *Agriculture and Human Values*, 3: 283–297.
- Davies A., Titterton, A.J., Cochrane C. (1995): Who buys organic food? A profile of the purchasers of organic food in Northern Ireland. *British Food Journal*, 97: 17–23.
- GfK Research Report (2006): Potenciál biopotravin na českém trhu. (The Potential of the Czech Organic Food Market.) GfK Praha a Synergy Marketing, Praha (online). Available at <http://eagri.cz/public/eagri/potravin/biopotravin/>
- Harper G.C., Makatouni A. (2002): Consumer perception of organic food production and farm animal welfare. *British Food Journal*, 104: 287–299.
- Loureiro M.L., Hine S. (2001): Discovering niche-markets: A comparison of consumer willingness to pay for a local (Colorado-grown), organic and GMO-free product. In: American Agricultural Economics Association Meetings, Chicago, Illinois, August 5–8, 2001.
- Magnusson M.K., Arvola A., Koivisto Hursti U.-K., Åberg L., Sjöden P.-O. (2003): Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behaviour. *Appetite*, 40: 109–117.
- McDonald M., Dunbar I. (2009): Market Segmentation. Elsevier Ltd; ISBN 9780750659819.
- Michelsen J., Hamm U., Wynen E., Roth E. (1999): The European Market for Organic Products: Growth and Development. University of Hohenheim, Stuttgart; ISBN 3-933403-06-5.
- Midmore P., Naspetti S., Sherwood A.-M., Vairo D., Wier M., Zanolli R. (2005): Consumer attitudes to quality and safety of organic and low input foods: a review. University of Wales, Aberystwyth (online). Available at [www.qlif.org](http://www.qlif.org) (accessed 15.6.2009).
- Onyango B.M., Hallman W.K., Bellows A.C. (2007): Purchasing organic food in US food systems. *British Food Journal*, 5: 399–411.
- Pecáková I. (2011): Statistika v terénních průzkumech. (Statistics in field surveys.) Professional Publishing, Příbram; ISBN 9788074310393.
- Raynolds L.T. (2000): Re-embedding global agriculture: The international organic and fair trade movements. *Agriculture and Human Values*, 3: 297–309.
- Schifferstein H.N.J., Oude Ophuis P.A.M. (1998): Health-related determinants of organic food consumption in the Netherlands. *Food Quality and Preference*, 9: 119–133.
- Torjusen H., Lieblein G., Wandel M., Francis Ch.A. (2001): Food system orientation and quality perception among consumers and producers of organic food in Hedmark County, Norway. *Food Quality and Preference*, 12: 207–216.
- Václavík T. (2008): Ročenka český trh s biopotravinami. (Yearbook of the Czech Organic Food Market.) Green marketing, Praha.
- Wandel M., Bugge A. (1997): Environmental concern in consumer evaluation of food quality. *Food Quality and Preference*, 8: 19–26.
- Wang Q., Sun J. (2003): Consumer preference and demand for organic food: Evidence from a Vermont survey. In: American Agricultural Economics Association Annual Meeting, Montreal, Canada, July 27–30.
- Wedel M., Kamakura W.A. (2000): Market Segmentation: Conceptual and Methodological Foundations. Kluwer, Dordrecht; ISBN 0792386353.
- Zakowska-Biemans S. (2011): Polish consumer food choices and beliefs about organic food. *British Food Journal*, 113: 122–137.
- Zanolli R., Naspetti S. (2002): Consumer motivations in the purchase of organic food: A means-end approach. *British Food Journal*, 104: 643–653.
- [www.biospotrebitel.cz](http://www.biospotrebitel.cz)  
[www.bio-info.cz](http://www.bio-info.cz)

Received: 12<sup>th</sup> December 2012

Accepted: 13<sup>th</sup> February 2013

---

*Contact address:*

Olga Kutnohorská, Institute of Chemical Technology Prague, Technická 5, 166 28 Praha 6, Czech Republic  
e-mail: [olga.kutnohorska@vscht.cz](mailto:olga.kutnohorska@vscht.cz)

---