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# Determinants of Purchasing Behaviour for Organic and Integrated Fruits and Vegetables: The Case of the Post Socialist Economy

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## 1. Introduction

Modern food consumer is highly concerned about the safety and quality of the food products purchased. This concern goes simultaneously with their awareness of the relation between the production practice and quality of food products, as well as environmental concern in regards to food (Thøgersen & Ölander, 2002). Moreover, the awareness has contributed towards growing demand for food from non-conventional production practices as well as an increasing consumer interest in having a closer relationship with the food producer (Thompson, 1998; Wier et al., 2003; Vermeir & Verbeke, 2006; Botonaki et al., 2006). This change has been especially significant in the demand for organic foods, since the global annual organic sales are estimated at around 38.6 billion US Dollars in 2006 which is double figure in comparisons with the figure in 2000 (Willer et al., 2008). Consumption of organic food is highly concentrated in North America and Europe since these two regions comprise 97% of the global demand (Sahota, 2008). Consumption in these two markets is growing at close to 20% annually (Wier and Calverley, 2002; Halberg et al., 2006). Fruit and vegetables is the largest segment in the European organic food market with almost one fourth of total organic food sales in 2006. Moreover, organic fruit and vegetables represented about 2 percent of all fruit and vegetable sales in Western Europe (Willer et al., 2008). This pattern is related particularly with the increased awareness of the importance of a healthy diet and positive perception of fruit and vegetable in this respect (Connor, 1994; Viaene et al., 2000; William & Hammit, 2001, Lambert N. 2001; Belows, et al., 2008).

Response towards these trends on the supply side is also evident, since organic agriculture is one of the most rapidly developing market segments in both developed and developing countries (Halberg, 2006). Land area under organic agriculture has increased from 16.9 million hectares in 2000 to 30.4 in 2005 globally, whereas the growth in Europe was even faster (Willer et. al. 2008). In 2005 the organic area made up 3.9% of the total utilised agricultural area in the European Union, and the highest proportions were recorded in Austria with 11.0%, Italy with 8.4%, and the Czech Republic and Greece both with 7.2% (Eurostat, 2007). Simultaneously the global organic food chain has been transformed from a local network of producers and consumers to a highly coordinated and formally regulated supply system (Raynolds, 2004).

Agricultural policies in many developed countries, including European Union, have responded to favourable market trends and benefits external to the markets (e.g. environmental and spatial impacts) arising from organic farming and other sustainable agricultural practices (Hamm et al., 2002). This is reflected in rising importance of measures to encourage and promote organic farming (OECD, 2003). With new EU legislation geared towards increasing the production of organic food in Europe applied since 2009, the growing awareness of organic food and its benefits should see the market continuing its high growth into the near future.

There is a rather great amount of research work attributed to the attitudes of consumers towards safe food, both in broad sense and with a particular accent towards organic fruit and vegetables. Determinants of food choice and radical changes of related behavioural patterns are challenging and important in many aspects. Initially, the main focus was to investigate consumer's needs and motivations in order to support agro-food industry and retailing sector in searching competitive advantage with supreme supply. Currently the questions of food choice became also an issue from the perspective of public health and motivation of the policy makers in developed economies to improve dietary patterns of the population. Contemporary research literature on food choice considers product attributes as one of the perspectives to increase understanding of consumer or buyer (Assael 1998). A product is comprehended as an aggregation of several characteristics and components – referred as product attributes; upon which buyers makes their choices. Consumers during a complex cognitive process form beliefs and develop attitudes and intentions. A number of papers have dealt with the consumer behaviour, decision-making process and attitudes towards notion of safety related to food, both in broad sense and with a particular accent towards food produced under a specific quality assurance system like organic agriculture.

Previous studies showed that consumers perceive organic food as of higher quality, safer and fresher (e.g. Thompson & Kidwell, 1998; Schifferstein & Oude Ophuis, 1998; Loureiro et al., 2001; Botanaki et al., 2006; Kihlberg, I. & Risvik, E. 2007). Another dimension of attributes related to organic food is positive environmental impact, since it is perceived as produce grown as natural and without chemicals (Grunert & Juhl, 1995). However consumers' concerns regarding the pollution tend to be less important drivers for organic food consumption than so called private benefits (Weir et al., 2003; Bellows et al., 2008). Therefore healthiness of the products in comparison to conventional food options is among the main reasons for organic food purchase (Loureiro et. al, 2001; Krystallis & Chryssohoidis, 2005; Kihlberg & Risvik, 2007; de Magistris & Gracia, 2008). In this respect the concern for children healthy diet has also been identified (Latacz-Lohmann and Foster, 1997). Yiridoe et al. (2005) exposed the importance of knowledge on organic food products as a factor that is strongly affecting buying decision, since consumers without information cannot differentiate the attributes of organic from conventional alternatives. Related factor to knowledge is trust in system of labelling and conformity to standards of production practices defined in regulation (Botonaki, 2006; Achilleas & Anastasios, 2008). The importance of price as a barrier to purchase fruit and vegetable from non-conventional production systems is confirmed by an increasing amount of research that assess the consumers' willingness to pay a premium for organic or safe products (e.g. Weaver et al. 1992; Underhill & Figueroa, 1996; Govindasamy & Italia, 1999; Boccaletti & Nardella, 2000; Canavari et al., 2005; Batte et al., 2007). Production yields are considerably lower for organic production and therefore achieved price premium is a key determinant for organic farming

attractiveness and profitability. Consumers' willingness-to-pay a premium shows the value they place on the product attributes, whereas socio-demographic characteristics, perceived quality and risks determine the value consumers are willing to pay.

From the brief literature review it is evident, that consumer behaviour in relation to quality identified food such as organic and food from integrated production system is an evolving phenomenon, and therefore needs to be constantly studied. Only precise knowledge regarding the consumer perception in this respect will provide sound foundation for business development strategies of agro-food producer. Likewise, this information is needed also to assist rapidly emerging food and agricultural policies that prevalently place stimulation of high quality fruit and vegetables consumption as an important objective. Therefore, a rapid growth in demand and production of these food categories necessitate continuous research in order to document and understand the evolution of the markets. Necessity to investigate consumers' attitudes towards quality identified food categories is even more expressed in case of countries where the corresponding markets have emerged only relatively recently. In these cases the underlying knowledge regarding consumer attitudes, perception and behaviour in relation to organic food is also rather insufficient. Countries that acceded to the European Union are a good example of such markets, since the accession brings inclusion into the common policy framework where organic agriculture and other quality identified food production play important role. In this chapter we are trying to contribute to a better acquaintance with consumers' attitudes and perception towards organic and integrated fruit and vegetables in the case of Slovenia. First, we describe the process of development of the organic and integrated food production systems, which is followed by the presentation of the Slovenian organic food market volume and the corresponding sales channel structure. Next, the detailed analysis of price premiums for organic food products at the retail level in major marketing channels is presented, which confirms that the Slovenian organic food market is still immature. The last part of the chapter is designed to contribute to a better acquaintance with consumers' attitudes and perception towards organic and integrated fruit and vegetables in the case of Slovenia. A country-wide survey has been conducted in order to develop a consumer behaviour model of qualitative choice which elucidates and quantifies the impact of various determinants influencing purchasing behaviour of organic and integrated fruit and vegetables in Slovenia. Results of this research are aimed at enabling more effective marketing strategies of organic and integrated fruit and vegetable producers in Slovenia, but also to support public policy initiatives to stimulate demand of these categories of food

## **2. Development of the organic and integrated food production system in Slovenia**

### **2.1 A general overview**

Market for organic fruit and vegetables in Slovenia started to develop in the late nineties, whereas the first attempts to promote integrated production were present a decade earlier (MAFF, 2006). Foundations for development of adequate certification system started with the establishment of Slovenian Organic Farmers' Association in 1997 by market oriented organic farmers. They were motivated from the cooperation with merchants and they both wanted to be able to put certified Slovenian products on the market, in order to satisfy evolving consumers demand, and to protect themselves from fraud and false organic labelling. The most important task of the association was firstly, to develop organic control

and certification, and secondly, to promote certified organic products and to support development of organic farming. Standards were then prepared by an NGO Institute for Sustainable Development and were published also by the Slovenian Ministry of Agriculture Forestry and Food. The standards were accordant to the IFOAM Basic Standards and some other national standards (e.g. Austrian Ernte and German Bioland). As early as in 1999, a total of 300 farms applied for certification (Slabe, 2002). Since then controlled farming systems such as integrated and organic farming are on the increase. During the period prior the Slovenian accession to the European Union national regulations have been accepted regarding to organic farming and integrated agricultural production system. After the accession Slovenia adopts entire EU system of food quality identification including organic farming (e.g. EEC. 2092/91). In the year 2005 “Action Plan for Development of Organic Farming in Slovenia until 2015” was adopted by the government (MAFF, 2005). In spite of the lack of market-related data at that time, one of its goals was “By 2015 a 10% share of organic foodstuffs of Slovenian origin on the national market is to be achieved.” However, at that time, the lack of data on organic food market and especially on its share of the total food market was a general feature even in the EU member states with more developed organic sectors (Padel S. et al., 2008). Today a significant part of fruit production (especially apples and pears) is produced following the integrated standards and marketed under the national label and two private collective marks, one for fruit and the other for vegetable. In 2010 around 58 thousand hectares of farmland was cultivated under the integrated farming system which represents more than one fourth of total arable land and permanent plantations in Slovenia (MAFF, 2011). In total 5.576 farms acquired an integrated farming certificate for the same year. More than two thirds of the area is arable land; mainly maize and feed grain and therefore the crop enter food chain as animal feed. The rest of the area is under permanent plantations including vineyards and particularly the produced fruit and vegetable is differentiated on the market.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Area in organic control (ha)	5.446	10.828	13.828	20.018	23.019	23.169	26.831	29.322	29.836	29.388	30.735
Share of organic land in total UAA	1,1%	2,1%	2,7%	3,9%	4,7%	4,6%	5,5%	5,9%	6,1%	6,3%	6,4%
No. of holdings in organic control	600	1.000	1.160	1.415	1.582	1718	1.876	2.000	2.067	2.096	2.218
No. of certified holdings	115	322	412	632	910	1.220	1.393	1.610	1.789	1.853	1.897

Source: Ministry of Agriculture, Forestry and Food 2011; SORS, 2010.

Table 1. Area of agricultural land in organic control and its share in UAA, No. of holdings in organic control and no. of certified holdings in Slovenia, 2000 – 2010;

On the other hand organic production is still rather sporadic and the market presence is rather low. In 2010 the area under organic farming was almost 31 thousand hectares, but almost ninety percent of the land is grassland and pastures. Only minor part of that area is intended for differentiated market production, since organic animal products (e.g. meat or dairy) are extremely rare. Rather, the produce is entering conventional supply chains, and the prevalent motivation of the farmers to enter the organic control is to be eligible for additional budgetary support. This means that the development of organic farming was not

predominantly market driven and therefore not entirely related to the consumer demand. The share of organic land in total utilised agricultural area was rapidly growing in the last decade and has reached 6,4% in the year 2010. In the same year 2,218 farms have been in the system of organic control and 1,897 have acquired the organic farming certificate (MAFF, 2011). It should be noted that intensity of growth for all the indicators of organic farming has slowed down in the last few years, which is mainly due to the already mentioned “passive organic farmers phenomenon” and therefore low market orientation.

There is still only limited marketing information available for the Slovenian organic sector, despite a stable increase of consumers demand and development of the supply. Some fragments of market-related estimates can be found in the EU research project OMIaRD (Hamm U. et al., 2002; Hamm U. and Gronefeld F., 2004). However, the estimates provided within the project largely lacked local expert verification and can thus have only an indicative value. The first exploratory analysis of the organic food supply was done by Slabe et al. (2005) who revealed significant organisational weaknesses of the domestic production and processing supply chain. The main identified drawback is insufficient supply, especially for the most demanded products such as fresh vegetables and fruits, grain and processed vegetables. Furthermore, there were no producer organisations and hence deficient marketing capabilities as well as fragmented production capacities. The problem of non-differentiation of the organic cattle was identified, since the considerable part of the farmers was selling their organic animals as conventional. However, the range of domestic organic food products on the Slovenian market is relatively broad, but the quantities available are extremely small. The main items are seasonal farm products or simple processed foods such as dried fruits, juices, vinegar, olive oil, wine, and some bakery products and pasta. One of the smallest industrial dairy enterprises has started with the production of fermented products in 2007 which are now widely available. Similarly, a poultry processing firm in 2010 offered organic meat and meat products in a major retail chain. However, there are still rather large challenges ahead for the Slovenian organic agro-food sector particularly to increase its market presence and assure stable supply of produce.

## 2.2 Slovenian organic food market volume

Only recently a rather comprehensive research project on Slovenian organic market development and domestic organic farms performance was carried out (Slabe et al., 2010). One of the central objectives of the study was to evaluate the organic food market volume with the evaluation of the sales channel structure and the share of the domestic products in total market supply. That part of the analysis was based on (i) in-depth interviews with the key market players which cover around 80-90% of total organic food turnover (ii) analysis of secondary information (mainly 2009 annual reports and other publicly available business documents) and (iii) a detailed survey of all national organic farmers markets including in-depth interviews with the market coordinators and a sample of approximately 30% of the farmers which were registered sellers on these markets in 2010.

The total estimated market value of organic food products and beverages in Slovenia for the year 2009 was 34.5 million EUR (Slabe et al., 2010). If this figure is compared to the total households expenditure for food and beverages in 2009 (SORS, 2011) the organic food and beverages represents approximately 1% of the budget. On average, per capita expenditure for organic foods and beverages respectively amounts to 17 EUR. If these two figures are compared with selected old EU countries this is relatively low. For example in Slovenia's

neighbour Austria per capita consumption was 104 EUR in 2009 with 6% organic share of food market. However, Austria is one of the leading countries in the world with regards to per capita consumption as well as share of the total food market. Higher per capita consumption and food expenditure share is found only in Denmark with 139 EUR and 7.2% respectively. If the data about the organic market are compared with the other new EU member states, Slovenia ranks the highest both in per capita consumption and share of the organic food in the total food market. Consumers in Estonia are the nearest by both indicators, since they spent 8.8 EUR on organic food which represents 1% of their total food spending. In Czech Republic per capita consumption was 7 EUR with 0.7% expenditure share, in Hungary 3 EUR and 0.3% respectively., whereas in Poland consumers spent on average 1.3 EUR on organic food annually, which is 0,1% of food budget. (Kilher et al., 2011).

The organic market in Slovenia has been growing at an annual rate between 10-15% the period between 2005 and 2009. The largest growth was in the category of fresh vegetables and fruits. The study revealed that the majority of the organic food and beverages sales are done through retail shop of different categories. It is estimated that more than 84% of Slovenian organic turnover is covered by these intermediaries. Direct selling on farm has 11% share while direct selling on the specialised farmers markets amounts to almost 5%. When the origin of organic products was estimated the study revealed that less than 5% of sales in retail channel is from Slovenia and respectively direct selling on farms or farmers markets is comprised of only domestic produce. The imports are mainly from the EU countries (Austria and Germany).

Sales channel	Market value (in mio EUR)	Channels share (in %)	Share of domestic (in %)
Retail shops ( <i>conventional, discount, specialised</i> )	29.0	84.1	< 5
On-farm	3.8	11.0	100
Organic farmers' markets	1.7	4.9	100
Total	34.5	100	

Table 2. The structure of Slovenian organic food market by the sales channel, 2009. Source (Slabe et al., 2010)

Around 80% of the organic products of the domestic origin (both fresh and processed) was sold directly by the farmers. Approximately 2/3 of that value was created through the on-farm sales while the rest was realised through the organic farmers' markets. In the marketing season 2009-10, there were 13 organic farmers' markets in different cities of Slovenia operating once a week. The largest organic market was in Ljubljana with 26 vendors of which 2 were artisanal organic processors and the rest were farmers with fresh products. The organic farmers markets in other towns are somewhat smaller usually with between five to ten vendors. The organic market coordinators and the vending farmers perceived a growing interest of consumers in the last three to five years for the organic food. Also the interviews in the prevailing marketing channel for organic food and beverages in Slovenia, namely the retail shops, indicated a high level of consumers' demand for domestic

organic products. This was supported by the observations at the outlets where many retailers explicitly indicated the organic products of domestic origin. The interviewed retailers also stated that they are interested in meeting consumers' demands for domestic organic products but are hampered by inadequate supply, both regarding the quantities and the range. Also low level of business professionalism for many producers was mentioned, in particular inappropriate preparation of the products, lack of reliability, absence of producers' organisations and sometimes also unrealistic price expectations. When the issue of low presence of domestic organic food in retail supply channel was presented to the organic farmers, they saw the main obstacles in their insufficient production capacity which is related mostly to the small farm size. Certainly, an important disincentive is also lower profitability of channelling the products through the intermediaries. Many farmers stated that direct selling is by far the most preferable marketing channel for organic food. The research has also identified several new forms of organic food sales within its duration (2008-2010), such as box schemes in both forms as direct and indirect sales. Furthermore, a institutions similar to Community Supported Agriculture was established. There has been also a significant increase of the number of registered enterprises involved in the trade of organic food products and also new local organic farmers' markets emerged. It can be assumed that the new selling channels and forms of direct sales is a response of innovative and proactive farmers to the consumers' demand. Contemporary food consumers require innovative selling methods with upgraded service. The farmers that are able to adequately answer to these needs will acquire premium market positions and sustainable competitiveness. For example in the case of box schemes, the farmer obliges himself to supply consumers with products in the agreed amount and frequency, while the consumers subscribe for the whole season and usually pay an agreed average yearly fee. The benefit is on both sides. The consumers have an assurance regarding the production methods and they normally pay less for the same amount of produce which is fresh and locally produced. The farmer, on the other side reduces risk of insufficient demand, but more importantly the actual marketing activity is minimised and the farmer can focus primarily on production.

### **2.3 Organic food price premiums**

Organic food production is determined with lower yields when compared to conventional farming and therefore the price differential is an important purchasing barrier for majority of consumers. On the other side the price premium affects the organic farmers' profitability and therefore business attractiveness. There is only limited information available on prices for organic products in the EU (European Commission, 2005). However, as a general rule, organic products receive a higher price than conventional products, but prices diverge depending on the market and on the product.

The research on organic sector in Slovenia (Slabe et al., 2010) includes also a rather detailed analysis of price premiums for organic food products at the retail level in major marketing channels. The price scan was performed in two periods (June and October 2009) in order to reflect the difference of the season. In total 65 products pairs of organic and conventional categories were included and prices were scanned in four outlet types (farmers' market, specialised shops, conventional retailers, discount retailers). In total almost thousand entries were obtained through the price scan. The price premiums for organic products were calculated with the reference to the conventional counterpart. The organic price premiums



are the percent increase over conventional prices and are calculated by subtracting the conventional price from the organic price and dividing the difference by the conventional price. Then the price premiums were aggregated by the product groups and marketing channels by simple arithmetic mean.

The average price premium estimated for the organic food products in Slovenia for the year 2009 was 87% with large variations between product groups and distribution channels. On average the price premium for the aggregate “oils and fats” was 146%, following by “vegetables” (104%) and “fruits” (88%). For some of these products we are able to compare their individual price premiums with the EU15 estimates from the year 2002 (European Commission, 2005). Potato, for example reached 143% price premium in Slovenia, whereas in EU15 has ranged from 30% in Ireland to 170% in Greece. For apples the range of price premiums in EU15 was even more extreme from 37% in Sweden to 283% in Portugal, whereas in Slovenia it was 131% despite rather considerable domestic supply. Organic dairy products were priced on average at 73% higher than conventional substitutes, whereas on EU15 average the consumer price premium for organic milk was about 50%, with extremes in Greece (129%), Portugal (124%) and Italy (117%).

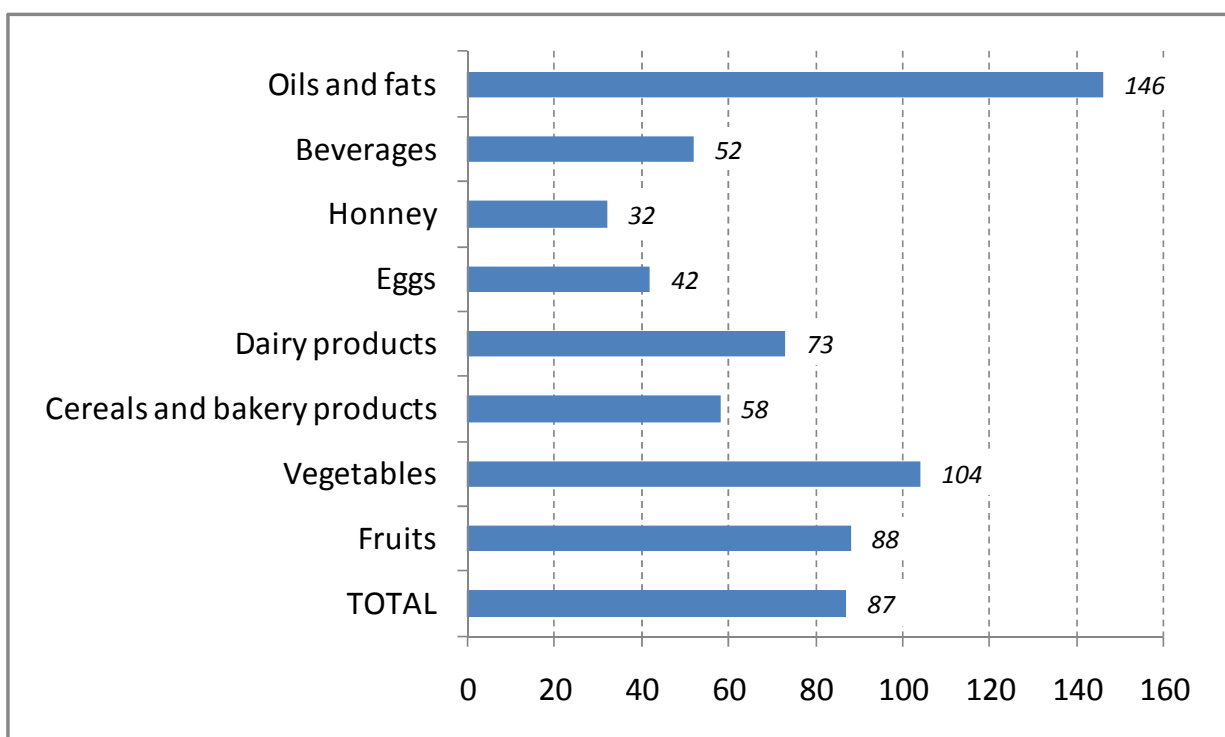


Fig. 1. Price premiums for organic food and beverages in Slovenia (2009)

For eggs the price premium was relatively low (42%), which is probably affected the fact that this sector is highly developed and efficient, but also proximity of the Austrian egg producers and their attempts to enter the Slovenian market. Price premium for eggs in Austria are at 25%, whereas in Denmark it is only 17% (European Commission, 2005). Again price premiums were high in Greece (231%), Spain (208%), Portugal (136%) and Italy (121%). The lowest price premium was found for organic honey which was on average 32% more expensive than its conventional substitute. Honey quality and hence the prices are relatively high in Slovenia and average consumers perceive conventional honey produced by small

and middle size beekeepers as natural product, often labelled with the national quality mark. Therefore it is difficult to realise a higher price differential for organic honey.

It can be concluded that the price premiums for organic food were in general highest for fresh products (fruit and vegetables) and less for processed ones. Seemingly, consumers perceive guaranteed free from harmful substances in combination with fresh as the key attributes where they are willing to pay more and organic fruits and vegetables are therefore most appropriate food aggregates.

When the aggregated price premiums for organic food in Slovenia were compared across the marketing channels it was revealed the highest are in the conventional retail chains (136%), following by the discount retailers (104) and specialty shops (100%). The price premiums on the organic farmers' markets were found to be the lowest at 78%. In general the quality of agricultural produce sold at the Slovenian markets (not only organic ones) is considerably higher than the quality in supermarkets and consequently the prices are also higher. Therefore, it is somehow surprising that the price premiums for organic food on the markets were the lowest. Some explanation can be found in the fact that virtually all the organic fresh products in retail are sold pre-packed, which adds considerable costs to the final price, since neither conventional nor organic fresh products at the farmers' markets are packed. However, the relatively high price premiums and its large variation are confirming the fact that the Slovenian organic food market is in immature and it is expected with its further expansion and development the premiums will eventually diminish which will stimulate consumer demand, but will turn away marginal and inefficient producers.

### **3. Consumer study on the purchasing behaviour for organic and integrated fruits and vegetables**

#### **3.1 The research objectives and methodology**

There are insufficient studies on organic consumers in Slovenia, therefore the presented research aimed at elucidation and quantification of the impact of various determinants influencing purchasing behaviour of organic and integrated fruit and vegetables consumers. A country-wide survey has been conducted on a representative sample of 1027 households. Beside the socio-demographic identification of the respondents, the main part of the questionnaire can be divided into the following sections:

- general dietary patterns and lifestyle determination;
- overall fruit and vegetable purchasing behaviour;
- household's fruit and vegetable self-sufficiency level;
- acquaintance, believes and perception of OIFV and
- purchase frequency of OIFV.

On the basis of the acquired data a consumer behaviour model of qualitative choice a (Pindyck and Rubinfeld, 1991) has been developed. Focus of the empirical scrutiny was given to identify determinants that influence purchase frequency of the OIFV. Methodology selection was directed by the ability for adequate incorporation of the ordinal nature of data describing purchasing behaviour of OIFV. The model that satisfactorily fulfils the criterion falls within the group of models of qualitative choice - more specifically the ordinal probit model (Pindyck and Rubinfeld, 1991).

Following Greene (1997), the ordered probit model can be specified, as built around a latent regression:

$$y_i^* = \beta' x_i + \varepsilon \quad (1)$$

where  $y_i^*$  is an unobserved frequency of quality fruits and vegetables purchase,  $\beta'$  is the vector of unknown parameters and  $x_i$  is a vector of explanatory variables (which may be continuous or discrete) denoting attributes influencing purchasing behaviour of respondent and  $\varepsilon$  is the independently and identically normally distributed error term. The ordered probit model tests the null hypothesis  $H_0: \beta'_k = 0$  for every explanatory variable denoting that the independent variable  $k$  does not have an effect in explaining changes in the probability of  $y_i$ .

Results from our survey provide information on the respondents' purchase frequency of organic and integrated fruit and vegetable which is ordinal with five categories. While  $y_i^*$  is unobserved, respondents actually report their purchase decisions by selecting one of the five categories. Values for  $y_i$  are 0 through 4, where 0 represents no purchase of organic and integrated fruit and vegetables and 4 represents 2-3 weekly purchases of such produce.

The analysis builds from the following hypotheses:

- i. consumers of OIFV in Slovenia are mostly influenced by the qualitative characteristics and not by the price premium;
- ii. barrier to purchase (demotivator) for OIFV organic are price and availability;
- iii. the main motivator to prefer integrated and organic fruit and vegetable to conventional is superior quality;
- iv. important quality characteristics to consumers are nutritive value, freshness, flavour or taste and general appearance.

The results of ordered probit models were interpreted by using the partial change or marginal effects on the probability of ordinal outcome. Estimation of the empirical model was conducted by using the LIMDEP software (Greene, 1999). In doing so, the independent variables - other than the one being examined - were held constant at their mean values. The calculation of quasi-elasticities is based on the results of marginal effects, i.e. partial derivatives of the probability function ( $Y$ ). Like "standard" elasticity coefficients, quasi-elasticity coefficients can be interpreted as the percentage impact of a unit change of an explanatory variable on the probability of the observed outcome.

### 3.2 Results and discussion

Before turning to the results from the consumer choice model, this section starts with some general results about the perception of organic and integrated fruit and vegetables by Slovenian consumers grasped from the survey.

Despite a rather short period of organic and integrated production presence in Slovenia and no explicit marketing activities the survey results show that consumers' awareness is generally high. As expected the highest rate of recall has been achieved for the term "bio" that is an equivalent for "organic" in Slovenian language. As much as 94.4% of respondents have associated these expressions with fruit and vegetable. More than two thirds relate the phrase "ecological" with food, whereas only 38% of the respondents were acquainted with the term "integrated".

An open ended question was prepared to acquire basic associations of the respondents with the analysed categories of fruit and vegetables. Results show a rather high degree of responds homogeneity, since the three most frequent replies represent more than 80%. Associations are positive and generally indicate correct basic understanding. However, results show that the respondents do not distinguish among the organic and integrated

categories and perceive them as synonyms. That’s why we have treated the frequency responses as for one product category only.

In total replies were categorised into 48 standardised answers and the highest frequency (37.1%) was attributed to association related to “healthy food”. With 23.4% follows the category “free from harmful substances” where replies like: chemical free, pesticide free and alike were aggregated. Direct associations regarding the production practice rank third with 21.7% of replies. Surprisingly low share of replies was associated with “environment” (1.7%) and better quality (1.5%). The highest frequency among the wrong associations went to “low calories” (0.7%).

Dependent variable in the consumer choice model was formed on the basis of the question where respondents were asked to evaluate (self reporting) purchase frequency of organic and integrated fruit and vegetable (OIFV). Responses were coded in an ordinal scale as presented in the Table 3 below.

Purchase frequency	Number of observations	Frequency (%)	Cumulative frequency (%)	Dependent variable (PURCHAS)
Never	261	27.97	27.97	0
Less than once a month	225	24.12	52.09	1
1-3 times a month	162	17.36	69.45	2
Once a week	181	19.40	88.85	3
More than once a week	104	11.15	100.00	4
Total observations	933*	100.00		

\* Non-responses or ‘I don’t know’ responses were omitted from the analysis

Table 3. Purchase frequency for organic and integrated fruit and vegetables

As suggested from the survey results Slovenian consumers assert rather a high purchase frequency for OIFV, since almost one third of them buy this category of produce at least once a week. Roughly the same share of respondents (28%) is non-buyers of OIFV and one quarter of them are sporadic buyers with purchasing fewer than once a month. About 17% of respondents buy this product few times a month.

Table 4 aggregates variables employed in the evaluated consumer choice model, which gives us some further insights to the topic. The finding that Slovenian consumers relate attributes of health as the main association with OIFV is confirmed with the highest rank from the likert test followed by the environmental attribute. Interesting finding comes from the question regarding the price of OIFV that ranks on last position. It seems Slovenes do not consider themselves as price sensitive.

When asked to compare general appearance and taste of OIFV with the “ordinary”, produce respondents evaluate the appearance to be less likely better than taste. However, the “level of disagreement” among respondents (standard deviation) is also higher.

Perception regarding the availability of the studied categories of fruit and vegetables in the most frequently used retail shop is inclined towards the answer “insufficient”; however again high standard deviation is observed. On the other hand, dependency between the origin of food and quality has been reported as highly important. As might be expected from the general characteristic of Slovenian rural economy the level of households’ self-supply with fruit and vegetables is rather high since only 37% of respondents purchase more than half of the total consumption.

		<b>Total</b> average (st. dev.)	<b>Y = 0</b> average (st. dev.)	<b>Y = 1</b> average (st. dev.)	<b>Y = 2</b> average (st. dev.)	<b>Y = 3</b> average (st. dev.)	<b>Y = 4</b> average (st. dev.)
No. of observations		933	261	225	162	181	104
Logarithmic transformation of households' annual income	<i>INC_LN</i>	12.24 (0.52)	12.09 (0.52)	12.29 (0.54)	12.30 (0.52)	12.30 (0.48)	12.30 (0.47)
Environmental attribute OIFV prod. environment friendly (likert scale, 1-7)	<i>ENVIR</i>	5.84 (1.56)	5.85 (1.66)	5.80 (1.53)	5.88 (1.68)	5.80 (1.44)	5.98 (1.48)
Health attribute: OIFV considered healthier (likert scale, 1-7)	<i>HLTH</i>	6.07 (1.35)	5.88 (1.55)	6.00 (1.30)	6.25 (1.21)	6.15 (1.25)	6.22 (1.32)
Price attribute: OIFV are too expensive (likert scale, 1-7)	<i>PRICE</i>	5.68 (1.55)	5.77 (1.59)	5.68 (1.41)	5.62 (1.61)	5.61 (1.60)	5.72 (1.56)
Visual attractiveness of OIFV (likert scale, 1-7)	<i>VISUAL</i>	4.71 (1.62)	4.40 (1.68)	4.41 (1.48)	4.78 (1.62)	4.98 (1.54)	5.38 (1.59)
Taste of OIFV deemed better (likert scale, 1-7)	<i>TASTE</i>	5.35 (1.51)	5.17 (1.56)	5.05 (1.59)	5.46 (1.46)	5.56 (1.40)	5.83 (1.31)
Availability of OIFV by frequently used retailers (likert scale, 1-7)	<i>RETAIL</i>	3.99 (1.91)	3.52 (2.01)	3.62 (1.89)	4.12 (1.82)	4.36 (1.70)	4.85 (1.77)
Perceived linkages between origin and quality (likert scale, 1-7)	<i>ORIG_Q</i>	5.92 (1.33)	5.99 (1.39)	5.74 (1.46)	5.82 (1.31)	6.04 (1.10)	6.10 (1.33)
More than 50% of F&V purchased (0=N; 1=Y)	<i>BUYER</i>	0.37 (0.48)	0.23 (0.42)	0.29 (0.45)	0.47 (0.50)	0.44 (0.50)	0.48 (0.50)
At least one meal daily cooked by themselves (0=N; 1=Y)	<i>COOK</i>	0.57 (0.50)	0.50 (0.50)	0.44 (0.50)	0.60 (0.49)	0.60 (0.49)	0.63 (0.48)
Residence in rural area (0=N; 1=Y)	<i>RURAL</i>	0.63 (0.48)	0.60 (0.49)	0.48 (0.50)	0.63 (0.48)	0.73 (0.45)	0.54 (0.50)

Table 4. Definition of explanatory variables and descriptive statistics of data used in the model

Table 5 presents the parameter estimates from the ordered probit model of consumer choice for organic and integrated fruit and vegetables in Slovenia.

Based on the results of a likelihood ratio test (Pindyck and Rubinfeld, 1991) the model is statistically significant at 99% or above. The results of the  $\chi^2$  test reveal that the differences between the model coefficients are statistically significant. However, the value of the likelihood ratio index (LRI) goodness-of-fit coefficient (Greene, 1997) is rather low (0.049), which implies that the model explains only a part of the variance within the dataset. However, the main purpose of this empirical work was not to maximise probability function but to evaluate impact of some attitudinal variables on purchase frequency. Rather low LRI values were also expected due to the fact the survey dataset comprised only rather general determinants influencing households' purchasing behaviour. For higher degree of explanatory capacity of the model clearer definition of determinants is needed in the future work.

<i>Explanatory variable</i>	<i>Ordered probit of purchasing behaviour</i>		<i>Marginal effects for various outcomes</i>			
	<i>Coefficient</i>	<i>t-statistic</i>	<i>Prob(Y=0)</i>	<i>Prob(Y=1)</i>	<i>Prob(Y=2)</i>	<i>Prob(Y=3)</i>
Constant	-4.29	-4.20	1.306	0.406	-0.181	-0.773
Households' yearly income	0.30	3.84	-0.092	-0.029	0.013	0.054
Environmental concern: OIFV not harmful	-0.08	-2.40	0.025	0.008	-0.003	-0.015
Health concern: OIFV considered healthier	0.10	2.63	-0.030	-0.009	0.004	0.018
Price consciousness: OIFV too expensive	-0.02	-0.67	0.006	0.002	-0.001	-0.003
Visual attractiveness of OIFV	0.10	3.82	-0.031	-0.010	0.004	0.018
Taste of OIFV deemed better	0.09	2.88	-0.026	-0.008	0.004	0.015
Availability of OIFV by frequently used retailers	0.13	6.00	-0.038	-0.012	0.005	0.023
Perceived linkages between origin and quality	-0.01	-0.05	0.001	0.000	-0.000	-0.000
More than 50% of F&V purchased	0.14	1.67	-0.043	-0.013	0.006	0.025
At least one meal daily cooked by themselves	-0.09	-1.08	0.028	0.008	-0.004	-0.016
Residence in rural area	-0.18	-2.11	0.056	0.017	-0.008	-0.033
Log likelihood function	-1155.27	/	/	/	/	/
Restricted log likelihood	-1215.00	/	/	/	/	/
LR test $\chi^2$ (d. freedom.)	119.49 (11)	/	/	/	/	/
LRI	0.049	/	/	/	/	/

Table 5. Results of the consumer choice model

Results show that the income status of consumers considerably determines purchasing frequency for organic and integrated fruit and vegetable. As has been expected, purchasing frequency significantly increases with higher household disposable incomes; however the estimated marginal effects reveal non-linear patterns for this variable. A high quasi-elasticity coefficient for non-buyers (Y=0) ranking to 0.66 suggests that low income level very likely determines no purchasing of organic and integrated fruit and vegetables. Also

the marginal effects revealed for this variable clearly suggest that higher frequency of purchase is closely related with households' disposable incomes (and vice versa). The corresponding quasi-elasticity for a consumer group that purchase such produce on a regular basis (once a week or more) is considerably lower (0.39), and therefore the intensity of the relation is smaller.

The model results with respect to the stated environmental concern reveal that respondents not considering production of organic or integrated fruit and vegetable as environment friendly (or they are indifferent to environmental aspects of production) are more likely to be among non-buyers. It however has to be further noted that the impact of environmental concerns on purchasing behaviour is significant, but not explicit. However, the highest relation is found for the non-buyer group (0.08). Rather inconclusive results regarding environmental concern might be further explained with low association between organic and integrated production practices and implications on environment by the Slovenian consumers.

If a respondent perceives organic and integrated fruit and vegetables being healthier than conventional products the probability (and frequency) of actual purchase is significantly higher. On the contrary, persons not considering quality products as healthier are more likely to be among non-buyers (quasi elasticity 0.10).

According to the model results, price consciousness has no significant impact on purchase of quality fruits and vegetables. Interestingly, non significant coefficient suggests that price of higher quality products is not a decisive element of purchasing behaviour. Purchasers are likely to continue buying such products notwithstanding higher prices. Surely, these results should not be considered a basis for an ultimate conclusion about low consumer price sensitivity for organic and integrated fruit and vegetables in Slovenia. Some additional and more sophisticated measuring approaches should be employed to confirm these indications. However, it is confirmed by the model results that consumers consider the visual attractiveness (appeal) of fruits and vegetables when they make purchasing decision. Consumers which believe that visual appealing of organic or integrated fruit and vegetables is not satisfying (worse than conventional), are less likely to buy these categories of produce. The highest quasi-elasticity is 0.02, which is again linked with decision not to purchase and therefore, and for that group of consumers the impact of visual attractiveness on purchase frequency is rather low.

Taste appears to significantly affect the consumer preferences to purchase fruit and vegetables from organic or integrated production systems. Model results show that consumers perceiving these categories of fruits and vegetables as having superior taste comparing the conventional ones are more likely to be among buyers.

It can be further examined, however that the consumers do not relate quality of fruits and vegetables with their micro-origin. The coefficient estimating this determinant is insignificant and therefore based on this results potentials for "local supply" marketing strategy, turned to be less appropriate.

Market for organic fruit and vegetable in Slovenia might still be considered as insufficiently developed. Situation for integrated produce is slightly better; however awareness of consumers is very low for this category. Therefore it has been expected, that availability of such products at "my retailer" has significant role on the consumer purchasing behaviour. Model results clearly confirm these expectations and favour strong emphasis on distribution strategy.

The level of self-sufficiency showed to be rather high for Slovenian households; however, result from the model doesn't confirm the expected inverse relations. The fact that households buy more than a half of fruits and vegetables does not have a statistically significant effect on frequency of purchase of organic and integrated fruit and vegetable.

Similar holds for dietary habits of households. Results from the model confirm that meal preparation is not significantly related with higher probability to purchase organic or integrated fruit and vegetables. Consumers which prepare at least one main meal within the household a day might be named as "traditional eaters" and they are not necessary the main purchasers of organic and integrated fruit and vegetable. Reversely; marginal effects suggest that for this group of respondents the probability for frequent purchase (outcome  $Y=3$ ) decrease, however with low quasi elasticity.

Results for the last variable suggest that consumers from rural areas are generally less likely to buy organic and integrated fruit and vegetables. This might be related either to the problem of availability for these produces in rural area, insufficient awareness of consumers but partially also to the household self-supply with fruit and vegetable.

#### 4. Conclusion

The organic food market in Slovenia started to develop sporadically immediately at the beginning of the period of economic transition, whereas the adequate certification system evolved several years later with first farmers being certified before the year 2000. Since then the both sides of the market are on rather sharp increase however, the supply side has some deficiencies. Namely, the area under the organic farming is increasing and number of farmers likewise, but is this is not sufficient to satisfy demand. Mainly due to the phenomenon of passive organic farmers, especially within the animal husbandry sector that are not marketing their produce into the organic sales channels. The organic farming area growth is actually mainly within the pastures and grassland categories and the farmers' main motivation to enter the organic farming is additional budgetary transfer without actual intention to be active in marketing organic products. Therefore, domestic production is relatively stagnant and Slovenian consumers can thus hardly obtain organic products of Slovenian origin in the massive food distribution channels, where the growing demand is mainly satisfied with imported products. It is therefore understandable that the involved organic food consumers prefer to purchase directly from the farmers, even if this is related with higher transaction costs, such as driving to the farm or visiting the farmers' market, etc. However, beside the assurance that the purchased products are fresh and local, also the prices and price premiums are lower when purchasing directly. In terms of per-capita spending on organic food and share of organic food expenditure in total food budgeted Slovenia with 17 EUR and 1% respectively ranks in the upper middle stratum of the EU27, where all new member states shows much lower values. This might indicate that the Slovenian organic food market is in the progressive stage of development however the results from the price scan and margin evaluation prove the opposite. Price premium for organic products in Slovenia are comparatively high (87%) with great variation between the product categories, where the fresh products (particularly fruits and vegetables) tends to have highest price margins. It is worth to notice, that when the price margins were analysed by the sales channels the lowest figures were found for direct selling either on farm or farmers' markets, whereas the margins were by far the highest in the conventional retail chains. This somehow controversial with the fact that only about 15% of the total Slovenian



organic food turnover is realised through direct selling, the remaining share goes to different formats of retail.

An interesting conclusion regarding the attitudes and perception of organic and integrated fruit and vegetable among Slovenian consumers is that they do not associate these categories with environmental dimension. The most frequent association in this respect is health (“organic or integrated is healthy”) and free from harmful substances, whereas less than two percent of respondents relate to positive impacts on environment. Implication from this finding is that much wider promotional and educational activities regarding organic and integrated fruit and vegetable is needed in Slovenia. Especially awareness for integrated production is very low (only 38% of respondents relate this term with food) despite the fact that the actual production of such fruit in Slovenia is considerable high especially for staple fruit such as apples and pears.

When the factors that might affect frequency of organic and integrated fruit and vegetable consumption in Slovenia were evaluated we firstly found that almost one third of respondents reported they buy this category of produce at least once a week. However, roughly the same share of respondents (28%) falls within the group of non-buyers. Surely, using the self reporting method for purchase frequency of a sub-group of product that is not clearly defined (or homogeneously perceived) might lead to over evaluation. However, very low share of incorrect associations (e.g. low calories) and high frequency of non-specific association (healthy and free of harmful ingredients) might indicate that consumers attribute “organic or integrated” category uncritically. They “believe” they purchase this category of fruit or vegetable if the produce fulfils some general stereotypes e.g. produced within extensive orchard. This conclusion again supports already identified need for more effective promotion and consumer education.

The ordinal probit model was constructed using purchase frequency for organic and integrated fruit and vegetables as dependent variable and 11 selected qualitative determinants as independent variables. Results of the model are statistically significant whereas the goodness-of-fit indicator (LRI) is rather low. However; at this stage of the research even with low explanatory capabilities for variance, the model gives valuable insight into the organic and integrated fruit and vegetable purchasing behaviour of Slovenian population.

The most significant impact on purchase frequency has availability of organic and integrated fruit and vegetables in the shop where respondents make majority of their shopping. Clearly, the importance of product availability favours effective distribution activities. As it can be observed on the Slovenian market, the emerging trends of direct purchase (e.g. farmers’ market, on farm buying, box schemes) and attempts of the retail chains to explicitly communicate their local fruit and vegetables sourcing (ethnocentrism, and/or low food miles) confirm this conclusion.

Model confirms important inverse implication of disposable household income on purchase frequency, where beside the affordability effect (these category of produce is more expensive) also education and awareness might influence the result. The two basic criteria of quality – taste and visual attractiveness have both significant effects on the frequency of purchase. If consumers perceive organic and integrated fruit and vegetables as superior in terms of taste and visual appeal, probability of a more frequent purchase is higher (it has however to be noted that quasi elasticity for both determinants is low). Nevertheless, descriptive results of the survey suggest that consumers claim they are often prepared to

“sacrifice” superior visual attractiveness for the organic and integrated category, but the taste should be better. This might be a useful guideline for business development strategies. Relation between environmental concern and organic or integrated fruit and vegetable is significant but rather inconclusive. Marginal effect are positive for non buyers, whereas for frequent buyers are negative. These results are accordant with conclusion about low association between environment and organic and integrated production. Insignificant relation has been evaluated for meal preparation patterns, however they are rather explanatory. Probability of being frequent buyer of organic or integrated fruit and vegetable increases with the fact that a respondent is only sporadically cooks meals at home. Traditional eating patterns are not a characteristic of aware and affluent consumers. They do increase the share of food consumed away from home and are also disposed to modern food categories where organic and integrated produce surely can be classified.

The contribution adds towards a better understanding of demand for organic and integrated fruit and vegetable in emerging markets. Despite this, additional research would be needed to understand sufficiently such a complex processes as food choice. In this respect, it would be interesting to study in greater detail consumers' attitudes by different distribution channels and strategies for organic and integrated fruit and vegetables. This would help to prioritise specific attributes and to evaluate price sensitivity of consumers for organic and integrated produce.

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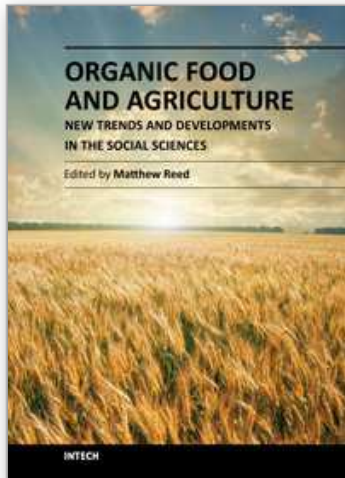
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The global phenomenon of organic food and farming, after three decades of progress, faces new challenges as markets mature and the impacts of the global recession start to change consumers and farmers' expectations. This global survey of the organic food and farming considers how the social sciences have come to understand in what way consumers make their choices as they shop, and how new national markets evolve. It also surveys how established organic sectors in North America and Europe are changing in response to the changes, that in part, the organic movement has created. Moving from a wide range of social science disciplines, methodologies and perspectives, this book represents an excellent starting place for new readers, and offers innovation to those already familiar with the literature.

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