


Subject:	Report of Task 4.1 Market needs along the supply chain	
Author(s)	Mariusz Maciejczak Warsaw University of Life Sciences - SGGW	Specific Support Action Project: Research for the benefits of SME
Date:	30.11.2009	FP7



Comparative report about information from supply chain actors

Deliverable 4.1

EU Project

Contract No. 218477-2 (FP 7)

Mariusz Maciejczak¹

in collaboration with:

**Sylvia Żakowska – Biemans²,
Achim Spiller³, Tim Obermove³,
Rob van Veggel⁴**

**Daniele Asioli⁵, Maurizio Canavari⁵
Hanna Stolz⁶, Lukas Baumgart⁶,**

¹ Warsaw University of Life Sciences–SGGW, Faculty of Economic Sciences (WULS),
Warsaw, Poland

² Warsaw University of Life Sciences – SGGW, Faculty of Human Nutrition and Consumer
Sciences, (WULS), Warsaw, Poland

³ University of Göttingen, Institute of Agricultural Economics, (UGOE), Göttingen, Germany

⁴ Wageningen University&Research, Centre for Innovative Consumer Studies, (WUR),
Wageningen, The Netherlands

⁵ University of Bologna, Department of Agricultural Economics and Engineering (UNIBO),
Bologna, Italy

⁶ Research Institute of Organic Agriculture, (FiBL), Frick, Switzerland

Warsaw, Poland, 08.11.2009

Acknowledgements

This report was produced with financial support from the Commission of the European Community under the 7th Framework Programme.

The views expressed are those of the authors and do not necessarily reflect the views of the European Commission, nor do they in any way anticipate the Commission's future policy in this area.

We would like to thank all project research partners that participated in this report as well as the experts of the SME association, which supported the work.

Disclaimer

The content of this volume does not necessarily reflect the Commission's views and in no way anticipates the Commission's future policy in this area.

The contents of this volume are the sole responsibility of the authors. The information contained herein, including any expression of opinion and any projection or forecast, has been obtained from sources believed by the authors to be reliable but is not guaranteed as to accuracy or completeness. The information is supplied without obligation and on the understanding that any person who acts upon it or otherwise changes his/her position in reliance thereon does so entirely at his/her own risk.

This publication represents the deliverable 4.1 in task 4.1 in work package 4: "Market needs along the supply chain" of the Research Project No FP7 – 218477-2 "ECROPOLIS -Organic Sensory Information System (OSIS): *Documentation of sensory properties through testing and consumer research for the organic industry*".
Seventh Framework Programme for European Research & Technological Development of the European Commission.
For further information see the project homepage at www.ECROPOLIS.eu

Executive Summary

The main aim of this research was - using the exploratory approach and the semi-structured questionnaire, through the telephone interviews - to investigate the needs of supply chain actors for consumer-relevant information and their experiences concerning consumer preferences with regards to the sensory quality of organic food products. There were 59 actors of organic supply chain interviewed in 5 countries. The results show that the sensory analysis of organic products should become more popular throughout the organic supply chain. Their outcomes should be used to develop the sensory quality of organic products. Finally the information about the sensory characteristics of organic products should be communicated to consumers to become an element of their buying behavior and accordingly the prerequisite of competition in the organic sector.

Table of Contents

Introduction.....	6
Methods and Data	7
Development of the organic supply chain in Europe	9
Results	11
1. Analysis of researched organic supply chain actors.....	11
2. Previous experiences concerning the sensory aspects.....	16
3. Importance of sensory aspects with regard to the marketing strategy	19
4. The relevance of sensory aspects with regard to consumer behaviour	23
5. Sensory strengths and weaknesses of organic products	26
6. Regulators opinions on the sensory issues of organic products	28
Conclusions - Market needs with regard to sensory properties along supply chain of organic food in Europe	30
Bibliography.....	33
Appendix 1. Brainstorming analysis	34
Appendix 2. The questionnaire.....	36

1. Introduction

The main aim of the Task 4.1. “Market needs along the supply chain” of the ECROPOLIS project was to identify the needs of supply chain actors for consumer-relevant information and their experiences concerning consumer preferences with regard to the sensory quality of specific food products investigated in the ECROPOLIS project.

To implement this task telephone interviews were conducted (using questionnaires, which were prepared based on the literature review carried out in Task 1.4) with 10 relevant supply chain actors (processors, retailers, logistics operators, and regulators) from Switzerland, Germany, Italy, The Netherlands, France and Poland. This sample included relevant members of the ECROPOLIS project consortium - SME-associations and SMEs - in order to ensure that also their needs are learned.

As aforementioned, the main purpose of the study was to study needs of supply chain actors for consumer-relevant information. It also aimed to learn these actors' experiences with consumer preferences for the sensory qualities of the food products investigated in the ECROPOLIS project.

This report compiles the results conducted in the several countries.

2. Methods and Data

The methodological procedure of this research consisted of the following steps:

1. The kick off meeting of the ECROPOLIS project in Frick, Switzerland in February 2009 included a brainstorming session [Robbins et al. 2003], whose goal was to find out the appropriate approach and areas of analysis needed to be executed within the Task 4.1. All assisting stakeholders and scientists were asked three main questions:
 - i. Why do we need the sensory evaluation of organic products?
 - ii. Why do we need the sensory development of organic products?
 - iii. What problems do we have with sensory quality of organic products?
2. Next, the answers were analyzed based on the semantic methodology of key words [Roberts 1997], and the results were described in form of research areas/blocks. The results of the brainstorming analysis can be found in the Appendix 1.
3. The results of the brainstorming analysis were confronted with the outcomes of the literature review on the state-of-the-art of sensory research on organic products conducted in WP1.
4. Consequently, a draft questionnaire was prepared and widely discussed among the partners participating in this task.
5. The outcome of the discussion was the semi-structured questionnaire. This is included in the Appendix 2 and consists of 3 main parts :
 - i. General information about the respondent,
 - ii. General questions to be asked to all stakeholders,
 - iii. Specific questions to be asked individually to producers/processors, retailers, logistic operators or regulators.
6. In the period from June to August 2009 telephone interviews were conducted by the project partners of Switzerland, Germany, Italy, The Netherlands, and Poland. Due to technical reasons the interviews of French organic supply chain actors will be held by the end of January 2010.
7. In September and October 2009 the outcomes of the interviews were analyzed. Firstly, all interviews were transcribed. Secondly, the transcripts were examined by each partner country using content analysis [Atteslander 2000]. Accordingly, the information from the interviews was systematically

categorized. The results of the analysis were described in country reports. Based on the latter, the comparative report was compiled. In a further step, this was discussed and agreed by the participating parties. As soon as they become available the comparative report will be integrated with the data coming from France.

The general methodological approach of the research focused on exploration of the information from the organic supply chain actors. Thus, the main goal of the telephone interviews was to collect qualitative data. The semi-structured questionnaire was used as a general guideline, a framework of the interviews. The interviewer, if necessary, had the possibility to ask additional questions, which could help to better understand the respondent's opinion toward the researched issues. Moreover, to provide a comprehensive overview, the interviewer had in some cases to approach more than one person from the same company, i.e. the chief executive and the marketing or producer director, due to the fact that those people could be responsible of different investigated areas within the company, i.e. marketing, sensory analysis.

The selection process of the sample respondents has been conducted based on the following criteria:

- Participation of the enterprise in the ECROPOLIS project consortium – companies members of the consortium were preferred,
- Branch of the organic sector where the company is operating – since the ECROPOLIS project focused on particular products, companies belonging to the products' branches were preferred
- Position in the supply chain – all actors within the supply chain were equally taken into account.

To select the companies for the interviews, different sources of information were used. However, dedicated databases of organic operators were used by the majority of countries. Since the minimum threshold of the sample size was set at 10 companies per country, it had been necessary to contact more companies. This explains why, in two countries (i.e. Italy and Poland) more than 10 interviews were conducted.

3. Development of the organic supply chain in Europe¹

There is growing importance of organic production and organic market worldwide and in particular in Europe. The organically cultivated land area rose, in the span of time 1985 – 2007, from 0.1 to 7.8 millions of hectares with a regular increasing trend over time. In this context Germany, United Kingdom, France and Italy represent the European countries with the highest sales (in 2007 5.30, 2.56, 1.90 and 1.87 billions of Euros respectively). Denmark, Austria, Switzerland and Sweden are the countries with the largest market share (in 2007 6%, 5.3%, 4.6% and 4.3% respectively). In 2007 the total value of the European organic market was estimated at approximately 16.2 billion Euros, and increased of nearly two billion Euros compared with 2006.

The market structures of the European organic market are heterogeneous and changing. In most European countries, conventional multiple retail outlets account for a share of more than 50 percent of the organic market. Both the specialized organic retail sector and the multiple retailers have been boosting the current development of the organic market by creating more awareness of organic foods through promotion and by giving to these products a higher share of their assortment. The countries showing the largest market shares in Europe express the highest percentage of general retail trade as distribution channel. In Denmark, Austria, Switzerland and Sweden the impact of specialized retailers is quite low (5%, 18%, 15.1% and 0% respectively) if compared to countries such as Germany where the volume of sales is high but the market shares are lower (in 2007 3.1%). Conventional supermarkets are responsible for the growth of the organic market, especially in Scandinavian countries. Currently, these retailers capture new organic markets in several Central and Eastern European countries like Poland and Hungary. Multiple retailers have substantially gained in importance for the recent development of the European organic market, particularly in Central and Western Europe. In these countries, organic market structures are well developed, determined by an omnipresent supply of organic products along with a high consumers' awareness of organic products.

¹ **Based on** - Canavari M. et al. (2009): *Summary report on sensory related requirements in regulations and standards for organic production*. Deliverable No. 1.2; as well as Spiller A., Obermove T. (2009): *State-of-the-art report on market needs and consumer expectations*. Deliverable No. 1.4. ECROPOLIS Project (No. 218477-2), Research Institute of Organic Agriculture (FiBL), Frick, Switzerland.

The current development in these countries is driven by a set of conventional players.

However, most southern European countries, e.g. Italy and Greece, remain unaffected by this development, so that specialized organic retailers are still dominating the market and mainly account for growth. Nevertheless, conventional retailers are generally important, but the specialized organic retailers are more successful in penetrating the organic market.

These data would preliminarily suggest that organic markets are likely to grow most where multiple retailers promote with effectiveness organic products and that specialized retailers may not drive the transition from a niche market to higher volumes of transactions. Evidence outlines that organic market initially penetrates through specialized retailers and, in particular, through the fruits and vegetables sector and in the next stages spreads through traditional distribution channels.

Most of the studies agree on the fact that consumers are motivated to buy (to discard) organic products on the basis of the following widely mentioned motivations: health, environment, price, socio-demographic characteristics, as well as sensory attributes.

The process by which consumers acknowledge quality attributes related to organic products is a quite complicated issue and has been widely investigated by the literature. Consumer theory identified three types of goods: search, experience, and credence goods. Organic food is generally considered as a credence good because the consumer cannot directly verify the adopted methods of production, which is connected with a problem of information asymmetry. The producer has more information than what consumers can acquire. This is a typical problem identified by the literature as a market failure. The failure consists in the fact that when consumers cannot easily recognize quality goods, their willingness to pay a price premium is lower. As consumers are less motivated to compensate the farmers' effort to produce high quality products, organic producers are penalized and are induced to leave the market. This process is identified by the literature as the adverse selection phenomenon. Thus the setting up of a reliable certification system is a crucial factor to strengthen the market of organic product intended as a credence good that provides health and environment benefits obtained by environmental friendly methods of production.

The literature appears quite homogenous in finding that people are willing to pay a price premium if they have reliable information about health, animal welfare, environment and quality attributes of organic food. Among the motivations that can induce/discourage the consumer to purchase organic products, the sensory attributes represent one of the most controversial issues in the scientific literature.

4. Results

The results of the conducted researches are analyzed with regard to 6 areas, including:

1. Analysis of researched organic supply chain actors,
2. Previous experiences concerning the sensory aspects,
3. Importance of sensory aspects with regard to the marketing strategy,
4. The relevance of sensory aspects with regard to consumer behavior,
5. Sensory strengths and weaknesses of organic product,
6. Regulators' opinions on the sensory issues of organic products.

4.1 Analysis of researched organic supply chain actors

Overall 59 actors of organic supply chain were interviewed in 5 countries (Table 1). The majority of the interviewed companies were processors (59.9%) and 10.2% were categorized as logistic operators while 13.6% represented retailers, 16.9% were regulators and 3.4% belonged to other actors representing interest groups. The later are organic associations interviewed in The Netherlands.

Table 1. Number of actors interviewed in the countries

Organic chain actor	Number of actors interviewed in the countries					
	Switzerland	Germany	Italy	The Netherlands	Poland	Total
Processor	5	4	10	3	11	33
Logistic operator	1	--	1	4	--	6
Retailer	1	3	1	--	3	8
Regulator	3	3	1	1	2	10
Interest group	--	--	--	2	--	2

Total	10	10	13	10	16	59
-------	----	----	----	----	----	----

Source: own calculations based on the country reports

Almost half of the interviewed companies (45.76%) are engaged in more than one branch of the organic sector, which includes also regulators and certification bodies (Table 2). In the analyzed sample one-branch oriented companies were mostly operating in meat and meat products (15.25%), fruits and vegetable products (15.25%), as well as dairy products (13.56%). Other investigated branches of the organic sector were baker, grain and vegetable oil. Companies from all food sectors as well as meat and meat products were analyzed in each country. In most countries – i.e. 4 out of 5 - also the branches of dairy products as well as fruits and vegetables were taken into consideration during the analysis.

Table 2. Researched organic branches

Branch	Number of actors interviewed in the countries					
	Switzerland	Germany	Italy	The Netherlands	Poland	Total
Dairy products	3	1	2	--	2	8
Meat and meat products	2	1	2	1	3	9
Baker products	--	--	2	--	2	4
Grain products	--	1	--	--	1	2
Fruit and vegetables (fresh and processed)	--	1	3	1	2	9
Vegetable oil	--	--	1	--	--	1
All food sector (incl. regulators and interest groups)	5	6	3	8	6	27
Total	10	10	13	10	16	59

Source: own calculations based on the country reports

While most of the investigated organic supply chain actors – i.e. 43 out of 59 (72.8%) - are running their businesses only in the organic sector, 15.25% could be categorized as mixed companies with the main focus on the organic sector and, at

the same time, a small part of the business also in the conventional sphere. On the contrary, 11.8% of analyzed companies are focusing on the conventional sector and occasionally do some businesses in the organic sector (Table 3). Almost all actors are operating either regionally or on the country level. Only 4 actors identified themselves as business operating also internationally.

Table 3. Degree of specialization

Branch	Number of actors interviewed in the countries					
	Switzerland	Germany	Italy	The Netherlands	Poland	Total
Only organic	7	10	6	10	10	43
Mainly organic and less conventional	3	--	2	--	4	9
Mainly conventional and less organic	--	--	5	--	2	7
Total	10	10	13	10	16	59

Source: own calculations based on the country reports

In the study sample most of the actors are quite experienced ones: 28 of them are operating on the organic market for more than 10 years (3 even more than 30 years), while 19 of them for less than 10 years (Table 4). This shows that they have a high level of expertise regarding the development of the organic market as it is reflected by the number of years that they have been operating on the market.

Table 4. Years of company's experiences in the organic sector

Years of company's experience in the organic sector	Number of actors interviewed in the countries					
	Switzerland	Germany	Italy	The Netherlands	Poland	Total
1-10	4	4	5	1	9	19
11-20	2	3	7	5	7	21
21-30	3	3	1	--	--	4
31 and more	1	--	--	2	--	3

Source: own calculations based on the country reports

Analyzing the experience of the respondents, 23 people have more than 10 years of experience in the organic sector, whilst 31 have less than 10 (Table 5). At the time of the interview all respondents were assigned managerial positions and most of them were either running their own business or employed as marketing manager or brand responsible. That shows that information was provided by respondents with appropriate background and expertise.

Table 5. Respondents' years of experience in the organic sector

Respondents' years of experience in the organic sector	Number of mentions					
	Switzerland	Germany	Italy	The Netherlands	Poland	Total
1-10	5	4	6	4	12	31
11-20	2	3	7	1	3	16
21-30	2	3	--	--	1	6
31 and more	1	--	--	--	--	1

Source: own calculations based on the country reports

With regard to their business approach or market philosophy, the majority of analyzed actors are focusing on the quality of organic food (Table 6). In fact, the quality issues were mentioned 35 times during the interviews. The supply chain actors are committed to provide a general high quality of organic food products or to supply food products with high levels of healthy, good taste, and wellness. Additionally, concerning the market approach, issues connected to the level of price of organic products were mentioned 21 times, with special focus on keeping this price at a reasonable level for consumers as well as on further developing the market share of the company.

Table 6. Business approach or market philosophy of supply chain actors

Goal	Number of indications					
	Switzerland	Germany	Italy	The Netherlands	Poland	Total

Focus on higher quality of organic products	10	8	9	10	16	35
Focus on reasonable prices of organic products	4	4	5	4	12	21
Focus on the development of market share	4	5	2	6	13	21
Supervision and facilitation of the development of organic market	1	1	1	1	2	4
Other	3	3	4	3	6	13

Source: own calculations based on the country reports

It is important to mention that, due to the confidentiality of obtained information as well as taking into account the aims of this research, the questions concerning detailed information about the interviewed actors' locations as well as the level of their incomes or number of employees were not asked.

4.2 Previous experiences concerning the sensory aspects

During the study, different chain actors were interviewed. They represent different stages in the chain from producer to consumer. Analyzing previous experiences concerning the sensory aspects of their products and other products (both conventional and organic) one could observe that the closer the position of actors are to the beginning of the chain the more important sensory issues are for them (Table 7). In all analyzed countries the processors conducted sensory tests mostly internally and, only in some cases, externally. In the next steps of the organic chain the sensory analysis has been conducted as well, however, only internally. It is important to notice that in countries of highest sales of organic products, i.e. Germany, and highest market share, i.e. Switzerland, the importance of sensory tests is increasing at all levels of the chain. The sensory testing is regarded as standard procedure and the external testing is becoming more and more popular and promoted. In the countries being at the initial stage of the market development, i.e. Poland, the sensory analysis is seen as something additional, “extra”. It is promoted and pushed into the practice by the science sector.

Furthermore, it was observed that the perception of the sensory characteristics of organic products' varies differently among the supply chain actors. The opinions are far inconsistent since some of them claim that organic is superior to conventional whilst others justify the existing differences in sensory properties as being e.g. product related. However, these differences should be regarded within the context of high variability of sensory characteristics of organic products that comes from variability of ingredients and processing procedures.

Table 7. Previous experiences concerning the sensory aspects of their products and other products (both conventional and organic)

Organic supply chain actor	Switzerland	Germany	Italy	The Netherlands	Poland
Processor	<p>Out of 5 companies only in 1 the sensory test takes place on a regular basis and regards both conventional and organic products.</p> <p>One company does sensory testing at organic fairs – i.e. it gives consumers products to taste.</p> <p>All agree that sensory issues are important for organic products.</p> <p>The organic products differ from conventional ones with regard to sensory quality, raw materials and different processing techniques.</p>	<p>Sensory aspects play an important role in the buying behaviour of consumers, with special focus on organic consumers.</p> <p>In all 4 companies sensory analysis of organic and conventional products have been taking place using both internal and external /professional/ analysis.</p> <p>The results are used to build up marketing strategies.</p> <p>They look also for scientific data of sensory issues of both conventional and organic products.</p>	<p>Ten out of 13 (10/13) respondents of primary producers/processors have been involved into some forms of sensory analysis</p> <p>Half of the interviewees which have experience in sensory analysis had carried out internal and external sensory analysis (tests) of their organic products. The internal analyses are conducted from employees of the firm while external analysis are basically conducted from chefs, consultants, wholesalers, etc.</p> <p>Only in a few cases the processors have conducted sensory analysis on products of competitors.</p> <p>The processors that carried out sensory analyses have used empirical methods.</p>	<p>Informal, internal sensory tests.</p> <p>Organic products have better sensory characteristics.</p> <p>Sensory differences between organic and conventional products are hard to be assessed.</p>	<p>Sensory analyses are only conducted within the frame of scientific research to which producers are invited. Though, results are not further used for the marketing of the product.</p> <p>Based on such experiences, two processors have started to do internal sensory tests and one external test.</p> <p>The findings of the sensory tests are sometimes to the detriment and sometimes in favour of organic products. Thus, the latter always differ from conventional products.</p> <p>At fairs customers are provided with information regarding sensory characteristics.</p>
Retailer	<p>Internal sensory panel participates to sensory tests on a regular basis.</p> <p>Clients appreciate sensory properties both of organic and of conventional products.</p>	<p>In house sensory analysis system.</p> <p>They do not trust external – professional analysis.</p> <p>Retailers do not carry out sensory analyses.</p> <p>It would be interested to learn more about sensory issues.</p>	<p>Some actors carry out sensory tests at the consumer level. The sensory tests which are conducted involve 200 – 400 consumers who analyze both conventional and organic food products. There are differences in terms of sensory aspects between organic and conventional food, but these depend on many factors, such as type of products (e.g. organic poultry meat present high differences regarding the sensory characteristics perceived by consumers), type of processing (e.g. a higher</p>		<p>No sensory analysis was carried out.</p>

			<p>level of processing may reduce the difference in sensory aspects comparing organic with conventional food products), etc.</p> <p>The specialized organic food shop does not conduct the sensory analysis, but it has a lot of experience in terms of what the consumers prefer, which are the consumers expectations, etc. This experience is due to the strictly contact that organic shops employees have with consumers</p>		
Logistic operator	<p>Organic products do not taste better than conventional – there is no scientific evidence that they taste different. There are many reasons of these differences, however most of them comes out from organic process of production and processing.</p> <p>However, doing some internal tests the better taste of organic carrots was observed.</p> <p>There are many differences in sensory attributes of different organic products.</p>			<p>Informal, internal sensory tests.</p> <p>Organic products differ from conventional ones in their sensory characteristics depending on the product.</p>	No sensory analysis carried out.
Interest groups				Two interest groups promote formal sensory tests.	

Source: own elaboration based on country reports

4.3 Importance of sensory aspects with regard to the marketing strategy

Analyzing the importance of sensory aspects with regard to the positioning/strategic concept of products one could state that in all levels of the chain the sensory information about organic products is seen as very important for marketing (Table 8). It is stressed that their importance will grow in the future. Additionally, the necessity to ensure high standard of organic products with regard to sensory attributes is mentioned at all stages of the organic chain. The affirmations (given during the interviews) are not translated into practical implementation of positioning/strategic products' concepts.

Currently, sensory aspects are of primary importance in the process of new product development by the processors in the countries with well developed market, i.e. Switzerland, or with standard retail chains as main distribution channels, i.e. The Netherlands, where supermarkets demand exact sensory quality of organic products, comparable to conventional ones. Sensory aspects play also an important role in niche markets, where one of the unique characteristics is the superior sensory attribute, i.e. Italian cheese.

In growing markets, i.e. Poland the marketing of products does not include any information about the sensory issues.

Analyzing future prospect of a marketing strategy it is important to mention that there is an agreement that such strategies should take the sensory characteristics into account (Table 9). Addressing sensory attributes into the general marketing strategy of an organic product should be only one of its elements. Here the importance of market information asymmetry is playing an important role, because only well informed consumer will be able to respond to such strategy.

Table 8. Importance of sensory aspects with regard to the positioning/strategic conceptualization of their products

Organic supply chain actor	Switzerland	Germany	Italy	The Netherlands	Poland
Processor	<p>Sensory testing as a base of product development is important.</p> <p>It is important to ensure high sensory standards of organic products.</p>	<p>Four out of 5 companies affirm that sensory analysis is regularly included in the product marketing and development strategies.</p>	<p>With except of one case, all the respondents have shown interest into further develop their know-how of sensory-related issues.</p> <p>The latter could improve the characteristics of their products in the process of food product development and, in this way, help the company to meet consumers' expectations and wishes. Thus, the knowledge of consumer behaviour would be crucial for strategic positioning and conceptualization of organic food for primary producers/processors.</p> <p>It appears that the importance of sensory aspects depends on many factors such as type of product, seasonal trend, level of processing of products, post-harvest treatments, etc.</p>	<p>Sensory testing as a base of product development is important.</p> <p>It is important to ensure high sensory standards of organic products, which should be compared to the conventional one.</p> <p>[supermarkets] clients determine all requirements of products, including sensory characteristics.</p>	<p>The marketing of products does not include any information about the sensory issues.</p> <p>Sensory aspects will gain more importance in the future.</p>
Logistic operator	<p>Sensory information about organic product is important for marketing.</p>			<p>It is important to ensure high sensory standards of organic products, which should be compared to the conventional one.</p>	
Retailer	<p>Sensory information about organic product is important for marketing.</p>	<p>The marketing of products does not include any information about sensory-related issues.</p> <p>Sensory aspects will gain more importance in the future.</p>	<p>Knowledge of sensory related aspects would be important for strategic decisions along the all chain.</p> <p>The results of sensory analysis are taken into account in the process of product development. This is</p>	<p>Retail channels determine the sensory characteristics of organic food. In case of regular supermarkets organic should be similar to conventional products.</p>	<p>The marketing of products does not include any information about sensory-related issues.</p> <p>Sensory aspects will gain more</p>

			particularly important for typical, highly specialized or niche food products (e.g. Mortadella di Bologna) which are basically purchased by the consumers for the better sensory aspects that they have in comparison to mass-market food products which are not purchased by the consumers for their sensory characteristics.		importance in the future.
Interest groups				Sensory information about organic product is important and should be widely used in the strategies of product marketing and development.	

Source: own elaboration based on country reports

Table 9. Future prospect of a strategy taking into account sensory aspects

Organic supply chain actor	Switzerland	Germany	Italy	The Netherlands	Poland
Processor	<p>It will be a little success to promote the organic products with special emphasis on the sensory issues.</p> <p>Sensory as an element of the general organic strategy.</p> <p>It should be quite obvious that the sensory aspects need to be taken into account in the strategies of food actors.</p>	<p>It should be quite obvious that the sensory aspects need to be taken into account in the strategies of food actors.</p>	<p>Overall, there is a great interest in taking into account the sensory aspects in the future strategies.</p> <p>However, due to the high costs of sensory analysis the small enterprises interviewed declare that this will be possible only if the government will fund the analysis.</p>	<p>Retail channels determine the sensory characteristics of the organic food. In case of regular supermarkets organic should be similar to conventional products.</p>	<p>In the future sensory issues will gain importance</p>
Logistic operator	<p>It should be quite obvious that the sensory aspects need to be taken into account in the</p>			<p>Sensory aspects will gain more importance in the future.</p>	

	strategies of food actors.				
Retailer	It should be quite obvious that the sensory aspects need to be taken into account in the strategies of food actors.	Sensory aspects will gain more importance in the future.	for certain organic food products and certain types of consumers the strategy of taking into account sensory aspects would have a crucial importance. For the segment of consumers who do not purchase organic food products based on ideological or hedonistic motivations, the sensory aspects will have more relevance in the firm strategy.		In the future sensory-related issues will gain importance. It will be necessary to transmit the information on sensory aspects to consumers.
Interest groups				The sensory aspects have to be taken into account in the strategies of food actors	

Source: own elaboration based on country reports

4.4 The relevance of sensory aspects with regard to consumer behaviour

Taking into consideration the relevance of sensory aspects with regard to consumer behavior the analysis of Table 10 indicates that the sensory aspects play an important role. However there is an interfacing with other aspects such as type of products, level of processed products, consumer behaviour, etc. Moreover, sensory characteristics, especially flavor and taste, are important motives to buy, but they are not seen as the only determinants of consumer choices. The other determinants are identified by the actors of the analyzed organic supply chains similarly as by the scientific literature, as health, environment protection, etc.

Surprisingly it appears to exist a kind of mutual agreement among most of organic supply chain actors in most of analyzed countries concerning the acceptable level of price for organic products. According to the respondents, due to the higher quality of organic products – including sensory characteristics and the other above mentioned attributes- the consumers might be willing to pay up to 50% more of the price of conventional products. This however depends on various aspects, such as type of products, level of processed products, consumers behaviour, etc.

Table 10. Estimation of the relevance of sensory aspects with regard to consumer behaviour

Organic supply chain actor	Switzerland	Germany	Italy	The Netherlands	Poland
Processor	<p>Taste is one of the motives to buy, other sensory attributes also play an important role, however there are also other issues such health, environment, etc.</p> <p>Heavy users might pay higher price for organic products with superior taste or other sensory characteristics.</p>	<p>In general organic products should cost more, but no more than 20% -30% compared to conventional products.</p>	<p>Sensory characteristics of organic foods are always taken into account by consumers when they decide to buy organic foods, but with exception of tomato juice, their sensory characteristics do not appear to be determinant in the consumer choices.</p> <p>Regarding organic products, the willingness to pay (WTP) for sensory aspects is difficult to quantify. Most respondents perceived that consumers would be willing to pay a premium for organic foods ranging from 11% to 50% in comparison to conventional ones; while two respondents think that consumers would pay a premium ranging from 0% to 10% or more.</p>	<p>Taste is one of the motives to buy, however there are also other issues such health, environment, etc.</p>	<p>Most of producers indicate sensory issues as important or very important, for consumers.</p> <p>Their opinions concerning consumer WTP do not differ very much: some indicate a range from 11% to 50%, a respondent indicates a price premium up to 10%, another one up to 100%. In all cases it all depends on the product.</p>
Logistic operator			<p>The sensory aspects are important in consumer behaviour, but they depend on various aspects, such as type of products, level of processed products, type of consumers, etc.</p> <p>the interviewed retailers/logistic operators said that Regarding organic products, the willingness to pay (WTP) for sensory aspects is higher than for conventional one and it is estimated between 11% and 50%. It depends on the type of product.</p>	<p>Taste is one of the motives to buy, however there are also other issues such health, environment, etc.</p>	
Retailer		<p>In general organic products should cost more, but no more</p>			<p>Most of retailers indicate sensory issues as important or</p>

		then 20% -50% compared to conventional.			very important for consumers. They agree that WTP for organic products is higher than for conventional products (range: from 11% to 50%).
Interest groups				Taste as one of motives to buy, however there are also other issues such health, environment, etc.	

Source: own elaboration based on country reports

4.5 Sensory strengths and weaknesses of organic products

During the interviews sensory strengths and weaknesses of organic products were identified as well (Table 11).

As non questionable strengths the superior sensory attributes such as taste and flavor were mentioned.

As weaknesses the low level of standardization of sensory characteristics, i.e. the same shape, as well as the high variation of products concerning their sensory quality were indicated.

Table 11. Sensory strengths and weaknesses of organic products

Organic supply chain actor	Switzerland	Germany	Italy	The Netherlands	Poland
Processor	+ more intensive flavors and better taste compared to conventional food. - no standardized ingredients. - high variation of products concerning their quality.	+ more intensive flavors and better taste in comparison to conventional food. - there are few exceptions.	+ more intensive flavors and better taste compared to conventional food. - the low level of standardization of sensory characteristics.	+ better taste compared to conventional food.	+ better taste compared to conventional food.
Logistic operator			+ organic products show better flavors and taste than conventional foods		
Retailer	+ more intensive flavors and better taste compared to conventional food.	+ the more intensive flavors and better taste in comparison to conventional food.	- sometimes it would be difficult to differentiate between organic and conventional based on sensory aspects.	+ better taste compared to conventional food.	+ better taste compared to conventional food.
Interest groups				+ better taste compared to conventional food.	

Source: own elaboration based on country reports

4.6 Regulators' opinions on the sensory issues of organic products

Although regulators of organic market are not directly involved in the organic supply chain, they were also interviewed as important actors facilitating the development of the sector (Table 12). During the interviews both state regulators and non-governmental institutions such as associations and certification bodies were questioned.

In general the regulators do not see the sensory issues of organic products as relevant for the regulations within the sector. In all countries they pointed out that the regulations of organic sector in Europe, both at the national and associations' levels, do not directly address issues of sensory characteristics of organic products.

The regulators are in favor for more scientific data concerning sensory characteristics of organic products. Some do see space for sensory-specific articles in the regulations, some would not include them. They also claim that the consumers should be better informed about the sensory issues of organic products.

Table 12. Regulators' opinions on the sensory issues of organic products

Question	Switzerland	Germany	Italy	The Netherlands	Poland
Relevance of regulations and standards for the sensory marketing of organic products (EU standards, standards of organic associations)	<p>Sensory issues are not relevant in the inspection process.</p> <p>It is not possible to set up a standards for sensory characteristics of organic products, however these play an important role in the marketing.</p> <p>Very often sensory characteristics of superior taste are not communicated well to the consumers of organic products.</p>	<p>The primary aim of the organic regulations is not to influence the sensory aspects of the food.</p>	<p>In Italy the organic food sector is very good and sufficiently regulated. The interviewees remark that the regulations and standards regard only the organic method of production and not other characteristics.</p>		<p>The regulations and standards regard only the organic method of production and not other characteristics.</p>
Estimation of the relevance of sensory aspects with regard to consumer behaviour.		<p>Consumers need to be informed about the sensory characteristics of the organic products. However, sensory analysis are very subjective, and consumers might not understand/trust them.</p> <p>WTP is range between 10% and 20%</p>			
Sensory strengths and weaknesses of regulations or standards concerning organic products with regard to the sensory quality	<p>More data concerning sensory-related issues are required because they would be helpful.</p>	<p>There is still space in the EU regulations for higher standards concerning sensory-related issues.</p>	<p>At present there are not any regulations or standards to regulate the sensory quality of organic food. This is a weakness of the organic sector which should be covered by a specific standard or regulation. Thus, it would be interesting to develop a standard method able to measure the sensory differences between organic and conventional food.</p>	<p>Usefulness of sensory data.</p>	<p>The regulations are already too complicated and should not be exacerbated by other difficult issues such as sensory.</p>

Source: own elaboration based on country reports

5. Conclusions - Market needs with regard to sensory properties along supply chain of organic food in Europe

The main aim of this research was - using the exploratory approach and the semi-structured questionnaires submitted through the telephone interviews - to investigate the needs of supply chain actors for consumer-relevant information with regard to the sensory quality of organic food products. It was aimed to investigate the experiences of relevant organic supply chain actors concerning the consumer preferences with regard to sensory issues of organic products.

The information during the interviews was gathered according to 6 thematic areas. However the synthesis of the analyses are presented in other dimensions. This was done in order to show exactly the areas of market needs with regard to sensory properties along supply chain of organic food in Europe. The dimensions are described as follows:

1. **PRODUCT.** As summarized in Table 13, all organic supply chain actors mention sensory attributes as one of special characteristics of organic products along with healthiness, sustainability, fair trade, etc. They mostly describe the sensory quality of organic foods as superior comparing to conventional food products. However in very few cases the sensory attributes of organic products are indicated as inferior, which is due to the high degree of variation among these attributes. **NEED – to be more conscious of sensory attributes of offered organic products.**
2. **CONSUMER** - In the opinion of the interviewed actors among the motives for buying organic products, sensory characteristics are very important together with other factors such as product and consumer type, etc. Moreover, sensory characteristics play either a primary or a secondary role in the selection process. **NEED – to communicate more sensory characteristics of organic products to consumers.**
3. **SENSORY** - The importance of sensory issues of organic food is expected to grow in the future. The respondents of our study also agreed that there is a lack of direct communication of the sensory characteristics to consumers. Despite the fact that prices of organic products are generally higher due to sensory attributes (e.g. better taste), the latter are rarely included into the

marketing strategies. It is also important to mention that more and more companies, especially processors – one of the first actors in the organic supply chain - do sensory analysis of their products. The majority of these analyses are not conducted on a regular basis and are concentrated at the product development phase. Moreover, they are executed internally, seldom externally by professional labs. **NEED – to pay more attention on sensory characteristics of organic products and develop their sensory quality.**

4. **MARKETING** - More aware actors, those who do execute the sensory analysis on their products, try to use it in applied marketing strategies. **NEED – to further develop these best practices into the applied marketing strategies.**
5. **INFORMATION** - So far, neither secondary data from sensory literature nor primary data obtained through different tests in the companies are very commonly used. Nonetheless, there is high interest to increase the use of such data. **NEED – to provide more information about sensory characteristics of organic products to supply chain actors and train them how to use such knowledge.**

In general one could stress that the sensory analysis of organic products should become more popular throughout the organic supply chain. The sensory analysis of organic products should be used to develop the sensory quality of organic products and information about the sensory characteristic of organic products should be communicated to consumers to become an element of their buying behavior and the prerequisite of competition in the organic sector.

Table 13. Organic supply chain actors and their opinions about sensory issues

ACTOR of the organic supply chain	PRODUCT – The specific characteristic of the organic product	CONSUMER – The motives of buying organic products	SENSORY – The sensory issues connected with organic products	MARKETING – The socio-economic aspects of sensory characteristics of organic products	INFORMATION – Sources of information on sensory aspects of organic products
Processor	Sustainable, healthier, genuine, tastier, natural, fair trade, high variation of quality attributes	Sensory aspects: important among other aspects such health, environment, wellness, etc. Sensory characteristics, esp. taste are becoming more and more important.	Hard to assess. Depends on product and process. In some groups it is possible to notice superior characteristics comparing to conventional. High variation of the sensory characteristics.	No direct communication of the sensory characteristics to consumers. Often “organic” means also better taste. Higher price due to superior taste. Introduction of sensory aspects to the marketing strategies.	Internal testing prevails in comparison to professional tests done in the labs. Mostly interested in case of product development. Most often used strategy – test by clients High interest in sensory publications.
Logistic operator	Sustainable, healthier, tastier, natural, fair trade,	Sensory aspects: important among other aspects such health, environment, wellness, etc.	Depends on product and process. In some groups it is possible to notice superior characteristic comparing to conventional.	No direct communication of the sensory characteristics to consumers. Higher price due to superior taste. Introduction of sensory aspects into the marketing strategies.	Most often used strategy – test by clients High interest in sensory publications.
Retailer	Sustainable, healthier, natural, fair trade, not always taste better	Sensory aspects: important among other aspects such health, environment, wellness, etc.	Depends on product and process. In some groups it is possible to notice superior characteristics comparing to conventional.	No direct communication of the sensory characteristics to consumers. Higher price due to superior taste Introduction of sensory aspects into the marketing strategies.	Internal testing prevails in comparison to professional tests done in the labs. Most often used strategy – test by clients High interest in sensory publications.
Interest group/ Regulator	Sustainable, healthier, tastier, natural, fair trade, genuine, less variation in the sensory characteristics needed	Sensory aspects: important among other aspects such health, environment, wellness, etc.	Depends on product and process. In some groups it is possible to notice superior characteristics comparing to conventional.	No direct communication of the sensory characteristics to consumers. Higher price due to superior taste. Introduction of sensory aspects into the marketing strategies.	High interest in sensory publications.

Source: own elaboration based on country reports

Bibliography

- Atteslander, P., (2000): Methoden der empirischen Sozialforschung. 9. Neu bearbeitete und erweiterte Auflage, Berlin; New York: de Gruyter
- Robbins S. P., Coulter M. (2003) : Management. 2003 Update. Prentice Hall
- Roberts C. W. (1997): Text analysis for the social sciences Methods for drawing statistical inferences from texts and transcripts. Lawrence Erlbaum Associates, Mahwah, Ney Jersey

Appendix 1. Brainstorming analysis

a) Answers to 3 questions asked at the kick off meeting of ECROPOLIS project

Why do we need the sensory evaluation of organic products?	Why do we need the sensory development of organic products?	What problems do we have with sensory quality of organic products?
<ul style="list-style-type: none"> - Because consumers are not sure that organic food is different from conventional - To find out specific characteristics of organic products - To improve test or organic products for light users in supermarkets - To improve organic foods - To position the organic foods in the market - To be able to distinguish organic products from conventional - To know how validate the organic products - It is not confirmed yet, that the organic food is better then conventional - To define an objective sensory profile of the organic products chosen - To improve the validation of organic products - SEGMENTATION- individual preferences profiles, grouping individuals of the base of taste preferences - Market development - Understanding food products and understanding consumers - More sensory information needed for marketing / training - Because information is not available on the market - For product development - For better validation of organic products and meeting consumers expectations - As a tool for sale products and indentify a products standard taste - To get knowledge about it - To make the knowledge about it explainable 	<ul style="list-style-type: none"> - To know better our products - To come closer to the needs of consumers - Taste not always good and not comparable to A-brand - Because the opinion of consumers is always changing - Because test is the most important factor for buying the product - To improve the quality of organic products - Sensory properties are very strong drivers of buying organic products - Product development – providing useful information to food companies to develop better quality products - Sensory development / improvement - Improve quality - Testing – societies need to be convinced - Some procesors are weak - To improve and gain market share - Because lack of knowledge - To improve product quality - To see what consumers wants 	<ul style="list-style-type: none"> - They very often differ from conventional products - We would like to have product with good taste – comparable to A-brands and judged by light users - In case of fresh products there is always a difference depending on climate, region, water, soil, etc. - Perhaps there are different segments, consumer groups, which prefer different sensory profiles, different product varieties are needed – it is important to address them to the right segments - To define them and tot rain consumers with them - Sensory quality of organic products are not clearly described - This is linked to many different parameters - Difficulty to associate sensory and socio-economic information fort he same consumer in large surveys - Bad taste - Organic always compared to mainstream – conventional products – needed an extra product development - Processors are unsecure about consumers expectations - Some segments see organic products with regard to their subjective standards - Processing problems - Differences to conventinal food - Consumers have no information about the sensory quality

b) Semantic analysis of the answers

Why do we need the sensory evaluation of organic products?	Why do we need the sensory development of organic products?	What problems do we have with sensory quality of organic products?
<ol style="list-style-type: none"> 1. specific (other, better) character of the organic products 2. improve the organic products 3. position / segmentation of organic products at the market 4. validate the organic products 5. improve market 6. marketing 	<ol style="list-style-type: none"> 1. Satisfy needs of consumers 2. Find drivers of buying the organic products 3. To know better the organic products 4. Develop quality of the organic products 	<ol style="list-style-type: none"> 1. Are the organic products really different from conventional? 2. Is the taste of the organic products really better? 3. We do not have enough information. 4. We want to train stakeholders 5. We want to associate sensory issues with socio economic ones.

c) Research areas discovered based on the analysis

- PRODUCT – The specific characteristic of the organic product
- CONSUMER – The motives of buying organic products
- SENSORY – The sensory issues connected with organic products
- MARKETING – The socio-economic aspects of sensory characteristics of organic products
- INFORMATION – Sources of information on sensory aspects of organic products

Appendix 2. The questionnaire

INFORMATION ABOUT THE RESPONDENT

- 1) Type of supply chain actor
 - producer
 - processor
 - retailer
 - logistic operator
 - regulator
 - other, please specify

- 2) Branch/sector/products (only to be posed to producers/processors, retailers, logistic operators)
 -
 -
 -

- 3) Degree of specialization (only to be posed to producers/processors, retailers, logistic operators)
 - Only organic
 - Mostly organic, sometimes conventional
 - Mostly conventional, sometimes organic
 - Only conventional
 - Other, please specify

- 4) How many years the company is operating in the organic sector?
 -
 -
 -

- 5) Where the company is located and is operating?
 -
 -
 -

- 6) What is the Corporate/Enterprise/Association philosophy and/or market approach. Please describe
 -
 -
 -

- 7) What position and what kind of tasks does the interviewed person have within his/her company/association. Please describe.

-
.....
.....
- 8) How many years of professional experiences has the interviewer in the organic sector.

.....
.....
.....

GENERAL QUESTIONS TO ALL STAKEHOLDERS

- 1) When you hear the term “organic product” what are the first associations that come to your mind? What are the specific characteristics of organic products? Please mention the most important attributes of organic products in your opinion?

.....
.....
.....

- 2) What do you think about the sensory differences between organic products and conventional ones? Please justify your answer. If you could compare organic products with conventional counterparts what kind of differences you consider as the most relevant? *[Note: If respondent for instance says, organic products have a superior taste, ask, what do you mean with ‘superior’ taste?]*

.....
.....
.....

- 3) Which organic products are bought specifically for their sensory qualities? By whom are these particular organic products bought? Whom sells these particular organic products?

.....
.....
.....

- 4) Have you noticed differences over time in the sensory appreciation of organic products? If yes, what differences?

.....
.....
.....

- 5) Do you have any experience with information about the sensory qualities of conventional products?

.....
.....
.....

- 6) Do you have any experience with information about the sensory qualities of organic products?

.....
.....
.....

- 7) Have you ever looked for sensory analyses of organic products? If you did, how and were did you look for these data?.

.....
.....
.....

- 8) How much more would consumers be willing to pay for a organic product that they appreciate more due to its sensory qualities than a similar conventional product?
 - a) They would pay the same price
 - b) Up to 10% more
 - c) From 11% to 50% more
 - d) From 51% to 100% more
 - e) More than 100%

PRODUCER / PROCESSOR

- 1) Please mention most relevant strengths and weaknesses of your organic products?

- 2) When developing your organic products, what are the benchmarks with respect to sensory qualities?

- 3) Do you have experience with information about the sensory qualities of conventional products?

- 4) In developing and/or marketing your organic products, have you ever used sensory analysis made for other organic products?

- 5) Did you make any analysis of your products for the sensory characteristics? If yes, please describe what kind of analysis have been conducted.

- 6) In your marketing, do you make any claims with regard to the sensory qualities of your organic products?.

- 7) Do associations of organic producers and/or retailers which you are a member, have standards or requirements on the production of organic products? If they do, what has been the effect of these standards/requirements on the production and marketing of your organic products?

-
.....
.....
- 8) Do you have any data information on it how consumers respond to the sensory qualities of your organic products? The sensory characteristics are for them:

Very important, they buy them mostly because of the sensory characteristics

Important, they are always taken into account

Similarly important to other characteristics, i.e. price, weight, etc.

Not important

- 9) Would you be interested to learn about it how to improve the sensory properties of your organic products? If yes, please describe why? *[Note: During the interview please try to find out if respondent perceives this one-dimensionally (inferior-superior) or multi-dimensionally (developing sensory qualities for a specific consumer segment)]*

.....
.....
.....

RETAILER / LOGISTIC OPERATOR

- 1) Please mention most relevant strengths and weaknesses of your organic products?

.....
.....
.....

- 2) Do you have experience with information about the sensory qualities of conventional products?

.....
.....
.....

- 3) In marketing your organic products, have you ever used sensory analysis made for other organic products?.

.....
.....
.....

- 4) Did you make any analysis of your products for the sensory characteristics? If yes, please describe what kind of analysis have been conducted.

.....
.....
.....

- 5) In your marketing, do you make any claims with regard to the sensory qualities of your organic products?.

.....
.....
.....

6) Do associations of organic producers and/or retailers which you are a member, have standards or requirements on the production of organic products? If they do, what has been the effect of these standards/requirements on the production and marketing of your organic products?

.....
.....

7) Do you have any data information on it how do consumers respond to the sensory qualities of your organic products? The sensory characteristics are for them:

Very important, they buy them mostly because of the sensory characteristics

Important, they are always taken into account

Similarly important to other characteristics, i.e. price, weight, etc.

Not important

8) Can you distinguish consumers who buy your organic products specifically from it sensory qualities, from consumers who do it for other reasons?

.....
.....
.....

9) Would you be interested to learn about it how to improve the sensory properties of your organic products? If yes, please describe why? *[Note: During the interview please try to find out if respondent perceives this one-dimensionally (inferior-superior) or multi-dimensionally (developing sensory qualities for a specific consumer segment)]*

.....
.....

REGULATOR

1) Do EU, national or associations standards or requirements have any influence for the sensory marketing of organic products? If they do, what has been the effect of these standards/requirements on the marketing of organic products?

.....
.....

2) Should EU, national or associations standards or requirements with regard to sensory aspects of organic products:

Pay much more attention on sensory characteristics of organic products

So far regulations are good enough

They should be liberalized

They are not important at all

3) Please mention most relevant strengths and weaknesses of regulations or standards concerning organic products with regard to their sensory quality?

.....
.....