

Fact sheet about sensory properties of organic cookies

- **recommendations for processing**
- **recommendations for product development**
- **recommendations for marketing**

Deliverable 6.3

FiBL Switzerland



Consumers' sensory preferences for organic cookies



France

French organic consumers prefer cookies with a relatively high sweetness and spiciness of taste and odour and do not like a very fatty taste and odour.

Germany

German organic consumers prefer cookies with a medium intense sweet taste and do not like cookies that are very dry and have a high intensity of floury taste as well as a very grainy and sweet odour.

Italy

Cookies with a sweet taste and odour and a medium intense fatty odour are preferred by Italian organic consumers. In contrast, high intensities of floury and grainy taste and odour as well as a high intensity of dryness, crispiness and hardness lead to a disliking of cookies.

Netherlands

Cookies with a very intense taste and a high sweetness and caramel taste and odour and a very spicy taste and odour are preferred by Dutch organic consumers. At the same time, the cookies should have a low intensity of the floury and grainy taste, while the texture should be hard and crispy.

Poland

Polish organic consumers prefer cookies with an intense floury taste, moderate sweetness and a slight spiciness. At the same time, the cookies should be very crispy and dry and they should not be hard.

Switzerland

Swiss organic consumers prefer cookies with a cacao odour and the cookies should not be too sweet. In comparison with other countries, the consumer preferences are more diverse.

Sensory properties of organic cookies

The main purpose of the ECROPOLIS project was to provide and exchange sensory information on organic food to the industry (organic associations, producers, processors, retailers, wholesalers) as well as to the public at large: the consumers. Not only sensory profiles comparing organic and conventional food products were developed. Besides, the impact of regulations for organic food production on sensory properties of organic food and the labelling effect on consumers' sensory preferences were investigated. The consequences of the results can now be used for improvements in product development and processing, as well as for sensory marketing of organically produced food.

1 Impact of EU organic regulation and private standards on sensory characteristics

1.1 Regulatory impact on sensory properties of organic cookies tested

The EU regulations have only few restrictions, which have bearing on the production of organic cookies. The regulations state that only natural flavours are allowed in organic production. Additionally, the amount of baking agents and other additives is restricted to those listed in Annex VIII of the regulation EC No 889/2008. However, these restrictions showed no general influence on the sensory characteristics within the project ECROPOLIS.

Bio Suisse standards prohibit the use of additional flavours and lecithin, whereas the governmental regulation allows natural flavours and lecithin (Link D 1.1). In case of the cookie samples tested in Switzerland, only the conventional sample contained flavours. Some of the organic samples contained vanilla extract and lemon or orange peel oil instead. However, a general impact of Bio Suisse standards on taste was not found.

1.2 Summarising impact matrix about regulatory impact on sensory properties of organic cookies

The regulatory impact through EU regulations and Swiss governmental regulations for organic food production (EU/CH), as well as through private organic standards (Bio Suisse) on sensory properties of cookies is shown in the following table.

Table 1: Impact on sensory properties of cookies through regulatory requirements

Relevant standard issues for sensory properties	Relevant restriction or general allowance	EU Regulation 889/2008	Private organic standards	Impact on sensory properties			Regulatory impact	
				Taste	Odour	Texture	EU/CH	Bio Suisse
Ingredients of agricultural origin	Flour	A	A	XX	XX	X	-	-
	Sweetening ingredients	A	A	XX	XX	-	-	-
	Fat	A	A	XX	XX	X	-	-
	Fruits, nuts, chocolate	A	A	XX	X	-	-	-
	Spices	A	A	XX	XX	-	-	-
	Flavouring ingredients	A if derived from natural substances	Bio Suisse: not allowed	XX	XX	-	-	(X)
Additives	Baking agent	A if listed in Annex VIII	Bio Suisse: A if listed in the standards	-	-	X	-	-
Processing aids	Emulsifier	A if listed in Annex VIII	Bio Suisse: lecithin not allowed	-	-	X	-	(X)
Processing methods	Bakery processes	A	A	X	-	XX	-	-

A: allowed; -: no impact; (X): probable impact; X: relevant impact; XX: high impact

2 Factors that influence the sensory characteristics of cookies

The product group of cookies is comprised of a high variety of different kinds of cookies.

2.1 Taste

The taste of cookies depends mainly on the ingredients of agricultural origin used. The following ingredients are the most influential factors on taste of the cookies tested:

- Kind of flour
- Kind of sweetener
- Kind of fat
- Additional ingredients such as nuts, fruits, chocolate
- Spices and flavours

The amount of the mentioned ingredients is also decisive for their impact on taste.

2.2 Texture

The texture of cookies is influenced by the ingredients and processing parameters, such as time and methods of dispersing.

2.3 Odour

Same as taste, the odour of cookies depends on the:

- Kind of flour
- Kind of sweetener
- Kind of fat
- Additional ingredients such as nuts, fruits, chocolate
- Spices and flavours.

3 Country-specific attributes of liking and recommendations to improve consumers' acceptance of cookies

The country-specific attributes of liking and disliking are listed starting with the most relevant characteristics identified.

France

Table 2: Consumers' cookie attributes of liking and disliking in France

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Dry texture▪ Floury taste▪ Hard texture	<ul style="list-style-type: none">▪ Fatty taste▪ Sweet taste▪ Fragmented texture▪ Apple-like taste▪ Apple-like odour▪ Fatty odour

Germany

Table 3: Consumers' cookie attributes of liking and disliking in Germany

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Fatty mouthfeel▪ Sweet taste▪ Rough surface▪ Bright appearance▪ Fatty odour	<ul style="list-style-type: none">▪ Dry texture▪ Sweet odour▪ Evenly border appearance▪ Grainy odour▪ Floury taste▪ Brittle mouthfeel▪ Fragmented texture

Italy

Table 4: Consumers' cookie attributes of liking and disliking in Italy

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Sweet taste▪ Fragmented texture▪ Honey-like taste▪ Sweet odour▪ Other tastes	<ul style="list-style-type: none">▪ Floury taste▪ Dry texture▪ Raisin-like taste▪ Sunflower-like taste▪ Crispiness▪ Salty taste▪ Sunflower-like odour▪ Grainy taste▪ Grainy odour

Netherlands

Table 5: Consumers' cookie attributes of liking and disliking in the Netherlands

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Intense taste▪ Sweet taste▪ First bite hard▪ First bite crispy/crunchy▪ Intense odour▪ Caramel taste▪ Sweet odour▪ Caramel odour▪ Spicy taste▪ Spicy odour▪ Pungent odour	<ul style="list-style-type: none">▪ Dry mouthfeel▪ Floury taste▪ Friable first bite

Poland

Table 6: Consumers' cookie attributes of liking and disliking in Poland

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Dry texture▪ Crispy texture▪ Overall quality▪ Floury taste▪ Fatty odour▪ Toasted odour▪ Sunflower-like taste▪ Sunflower-like odour	<ul style="list-style-type: none">▪ Hard texture▪ Sharp/strong odour

Switzerland

Table 7: Consumers' cookie attributes of liking and disliking in Switzerland

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Cacao odour	<ul style="list-style-type: none">▪ Sweet taste (a high intensity of sweetness leads to disliking)▪ Sweet odour

4 Label effect

No effect of the organic label on consumers' liking of the product (label effect) was found in relation with cookies. Thus, organic cookies do not have a positive image among consumers per se. In such cases, product improvement is the most promising strategy.

France

No label effect was found in relation with cookies in France. By tendency, the organic samples scored slightly worse in the branded test (with labelling) compared to the blind test (without labelling), whereas the conventional label led in two cases to slightly higher scores and in two cases to slightly lower scores. The French heavy users scored all cookies tested (both organic and conventional) higher in overall liking in the blind and the branded test.

The slightly positive organic label effect regarding cookies among heavy users of organic food suggests that 'organic' should be highlighted in shops that are frequented by heavy users. In contrast, light users of organic products need to be approached in a different way since they do not have a positive perception of sensory of organic cookies per se. Here, sensory marketing is a promising tool to increase consumers' acceptance of organic cookies. Herein, sensory differences should be explained to consumers. Also, product improvement and imitation strategies (imitation of conventional market leader products) are promising since organic cookies do not necessarily meet the sensory expectations of the average consumer.

Germany

The organic cookie samples were rated slightly better in the branded compared to the blind test in Germany. In the blind test, light users of organic food scored higher for the conventional samples, probably because those users are more accustomed to the taste of conventional cookies. In the brand test, no differences in scoring of organic and conventional cookies were found between heavy and light users.

The slightly positive organic label effect regarding cookies among organic consumers in Germany suggests that 'organic' should be highlighted as a unique selling proposition. However, this strategy can only be successful if accompanied by sensory and product information to increase consumers' acceptance of organic cookies. Herein, sensory differences should be explained to consumers. Also product improvement and imitation strategies (imitation of conventional market leader products) are promising, since organic cookies do not necessarily meet the sensory expectations of the average consumer.

Italy

In Italy, no organic label effect was found regarding overall liking for organic cookies. There were also no differences found between heavy and light users. This may be due to the higher importance of sensory properties, such as taste and odour, rather than non-sensory values of organic food production, which were mentioned as more relevant for Italian consumers than for consumers in the other countries.

Given the high relevance of sensory characteristics of cookies, sensory marketing is a promising tool to increase consumers' acceptance of cookies in Italy. Also, product improvement and imitation strategies (imitation of conventional market leader products) are promising strategies.

Netherlands

No organic label effect was found in relation with cookies in the branded compared to the blind tests conducted within the ECROPOLIS project. In the consumer research, Dutch consumers pointed out that they expect organic cookies to be healthier due to other kinds of sugar, such as honey, and a lower sweetness. In fact, the cookies tested within the sensory analysis in the Netherlands differed with regard to the sweeteners used. The conventional cookie was produced with refined sugar and several sweeteners such as glucose syrup, whereas the organic samples contained either raw cane sugar or wheat syrup. In addition, the conventional sample was the sweetest cookie.

Against this background, it is feasible to promote organic cookies with sensory and product information on the kinds of sugar used for the production of organic cookies in the Netherlands.

Poland

No organic label effect was found in Poland with regard to cookies. However, in the blind and the labelled test, heavy users scored in most cases slightly higher both for organic and for conventional cookie samples than light users.

Given that no positive label effect was found in Poland in relation with cookies, pointing out 'organic' as unique selling proposition is less promising. Instead, product improvement strategies are more promising.

Switzerland

Although half of the organic cookies tested within ECROPOLIS scored higher in the branded than in the blind test, the organic label effect was not significant. No differences in rating of cookies were found between heavy and light users.

Some Swiss organic consumers buy organic cookies, especially, because of health aspects. They expect organic cookies to be less sweet and, therefore, containing less sugar than conventional cookies. However, this expectation cannot be confirmed based on the results of the sensory analysis. Some organic cookie samples were less sweet, but others were sweeter than the conventional cookie sample tested.

Therefore, a sensory marketing strategy should focus on certain sensory properties and product ingredients that confirm the health expectations of organic consumers with respect to organic cookies.

5 Strategic options regarding product development and communication measures for organic cookies

Table 8 shows that different measures for product development and communication need to be taken, depending on which strategy a company is choosing. Country-specific issues as well as product related issues have to be kept in mind.

Table 8: Strategic options with regard to product development and communication

COOKIES Strategic options	Imitation / standardisation strategy	Differentiation strategy (freshness, authenticity)	Country specific issues
Product development	<ul style="list-style-type: none"> Ensure appropriate standardised sweetness, spiciness and dryness comparable with conventional benchmark products. Sweetness expectations: high in FR, IT, NL; medium in CH, DE, PL. Dryness expectations: high in PL, low in IT. 	<ul style="list-style-type: none"> Multiple differentiation possibilities: in particular, where specific taste, odour or texture preferences of consumers have been identified, e.g. specific crispy biscuits (NL or PL). For certain consumer segments specific ingredients might be tested (old cereal varieties, gluten-free, oats, etc.). 	<ul style="list-style-type: none"> Different country-specific expectations regarding taste and texture (see product improvement strategies).
Communication measures	<ul style="list-style-type: none"> Communicate country-specific preferred characteristics: spiciness (FR and NL); dryness or crispiness (NL, PL). Standardisation might be a first step in entering the market to ensure a constant demand, but could be risky in a longer term perspective due to competition by other companies. 	<ul style="list-style-type: none"> Communicate specific ingredients with additional added values (traditional cereals and cultural heritage, regionality, health benefits. etc.) for special consumer segments. Make consumer tasting in shops (to explain/experience differences) Offer training for sales staff. 	<ul style="list-style-type: none"> Preference for organic cookies in DE, CH and IT: Preference for conventional cookies in PL, IT, FR and NL. Positive influence of organic labelling in FR and partly in CH and DE. Low influence of organic labelling in IT, NL and PL: use other attributes then organic.

The following checklist helps to identify improvement potential regarding product development and sensory marketing of organic cookies.

Check points	Yes	No	Don't know
Raw material:			
Are all ingredients organic? Refer to EU Reg. 834/2007			
Are non-organic ingredients listed in Annex VIII?			
Could non-organic ingredients be replaced by an organic ingredient?			
Additives:			
Are the additives listed in Annex VIII?			
If applicable: Are the additives listed in private organic standards?			
Could the additives be avoided?			
Could the additives be replaced by an ingredient?			
Could the additives of agricultural origin be replaced by an organic additive?			
Could prohibited additives (e.g. flavouring ingredients) be replaced or other measures taken to improve the sensory quality?			
Processing aids:			
Are the processing methods allowed by the regulations and private organic standards (e.g. no GMO)?			
Are all processing steps really needed?			
Packaging:			
Is the packaging really needed for product protection (e.g. double packaging)?			
Is it possible to recycle the package?			
Is it possible to dispose it ecologically?			
Labelling:			
Are the minimal standards of the food law as well as of the organic regulations fulfilled?			
Could the declaration be extended for better consumer information (e.g. declaration of processing methods, origin of raw material, food miles)?			
Sensory Marketing:			
Could the restrictions on flavouring ingredients and their consequences on cookie taste and smell be used in marketing in a positive way?			
Could the restrictions on baking agents and emulsifiers (in case of private standards) and their consequences on cookie texture be used in marketing in a positive way?			

6 Description of OSIS

OSIS offers information about sensory aspects of food and related issues. All relevant data gained from research in the ECROPOLIS project are made available to consumers, associations, producers and processors of the food sector. OSIS offers various levels of data access based on the needs of the target users and highlights the relevant specific information, e.g. in a “European-Sensory-Journey”, easy-reading fact sheets or detailed reports.

Imprint

Stolz, H., Espig, F., Kretzschmar, U. (2011): Fact sheets on all the tested products in the appropriate language. Deliverable No. 6.3 of ECROPOLIS Project. Research Institute of Organic Agriculture (FiBL), Frick, Switzerland.

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Corresponding publications within the ECROPOLIS project

Schmid, O. (2009): Analysis of regulatory framework affecting sensory properties of organic products. Comparative report on specific sensory related requirements in regulations and standards for organic production.

Stolz, H., Jahrl, I., Baumgart, L., Schneider, F. (2010): Sensory experiences and expectations of organic food. Results of focus group discussions.

Obermowe, T., Hemmerling, S., Busch, G., Sidali, K. L., Stolz, H., Spiller, A. (2011): Marketing strategies: Using sensory attributes for organic marketing.

Buchecker, K., Cezanne, M.-L. (2011): Comparative report on sensory analysis (including description, consumer sensory tests, Preference mapping and “pan-European” landscape map).

Espig, F., Schmid, O., Stolz, H. (2011): Report with edited sensory data and linkage to consumer needs and acceptance – Impact of regulations and standards.

Cezanne, M.-L., Bülow, M., Buchecker, K., Matullat, I. (2011): Improvement potential for optimized sensory quality of organic food to meet consumer expectations.

Schmid, O. (2011): Report on the recommendations for a research agenda and strategic options for sensory quality communication for different target groups.

For further information please visit the project homepage at <http://www.ecropolis.eu>.