

# **Fact sheet about sensory properties of organic tomato sauce**

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

**Deliverable 6.3**

**FiBL Switzerland**



## Consumers' sensory preferences for organic tomato sauce



### France

In France, organic consumers prefer tomato sauce with both a high intensity of cooked fresh tomato taste and odour and a tomato puree taste and odour.

### Germany

German organic consumers prefer tomato sauce with a high intensity of cooked fresh tomato taste and odour, a low intensity of tomato puree taste and odour and an intense herb-like taste.

### Italy

An intense cooked fresh tomato taste and odour and a low intensity of tomato puree taste and odour are preferred by Italian organic consumers.

### Netherlands

Dutch organic consumers prefer tomato sauce with an intense cooked fresh tomato taste and odour and a high intensity of herb related taste properties. The appearance should have a medium amount of pieces and the herbs included in the tomato sauce should be clearly visible.

### Poland

Polish organic consumers prefer tomato sauce with a high intensity of herb related taste and odour properties, a slight oily taste and a thick texture with tomato pieces.

## Sensory properties of organic tomato sauce

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 tomato sauce tested

According to the EU regulation 889/2008, all tomato sauce ingredients of agricultural origin have to be organically grown. One exception that is relevant for tomato sauce is pepper. Pepper is listed in Annex IX of the EU regulation. This annex names ingredients that do not have to be produced organically. With regard to flavouring ingredients, the EU regulation requires natural flavours. Further aspects with a potential impact on sensory characteristics of tomato sauce are not regulated on the EU-level. In contrast, the private standards of Bio Suisse prohibit any kinds of flavouring ingredients. However, since no tomato sauce produced under the Bio Suisse standards was tested within the ECROPOLIS project, the impact of the prohibition of flavouring ingredients on sensory properties is unknown.

#### 1.2 Summarising impact matrix about regulatory impact on sensory properties of organic tomato sauce

The regulatory impact through EU regulations on sensory properties of tomato sauce is shown in the following table.

**Table 1: Impact on sensory properties of salami 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	Appearance	
<b>Ingredients of agricultural origin</b>	Tomato	A	No product with a private label was included in the sensory analysis.	XX	X	X	X	-
	Herbs	A		XX	XX	-	XX	-
	Sweetening ingredients	A		XX	-	-	-	-
	Salt	A		XX	-	-	-	-
	Fat	A		XX	-	(x)	-	-
	Flavouring ingredients	A if derived from natural substances		XX	(x)	-	-	-
<b>Additives</b>	Thickeners	A if listed in Annex VIII	-	-	X	-	-	
<b>Processing methods</b>	e.g. sieving	A	-	-	XX	XX	-	

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

## 2 Factors that influence the sensory characteristics of tomato sauce

### 2.1 Taste

The taste of tomato sauce is mainly influenced by the quality of the tomatoes, herbs and flavours used.

### 2.2 Texture

The texture and the resulting mouthfeel of tomato sauce depend on the processing methods (i.e. to what extent the tomatoes were sieved, to what extent the tomato sauce was thickened and the kind of thickeners used).

### 2.3 Appearance

The appearance of tomato sauce is influenced by the processing methods. The amount of pieces, in particular, has an impact on the filled appearance. Also the ingredients used affect the colour and the amount of visible herbs.

### 2.4 Odour

Similar to taste, odour of tomato sauce is influenced by the tomatoes used and the addition of herbs and flavours.

### 3 Country-specific attributes of liking and recommendations to improve consumers' acceptance of tomato sauce

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

#### France

**Table 2: Consumers' tomato sauce attributes of liking and disliking in France**

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none"> <li>▪ Cooked fresh tomato odour</li> <li>▪ Cooked fresh tomato taste</li> <li>▪ Sweet taste</li> <li>▪ Tomato puree taste</li> <li>▪ Tomato puree odour</li> <li>▪ Onion taste</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fish odour</li> <li>▪ Pepper odour</li> <li>▪ Intense odour</li> <li>▪ Oriental odour</li> <li>▪ Intense taste</li> <li>▪ Oregano odour</li> <li>▪ Olive taste</li> <li>▪ Oil taste</li> <li>▪ Salty taste</li> <li>▪ Size mouthfeel</li> <li>▪ Bite mouthfeel</li> <li>▪ Intense aftertaste</li> </ul>

#### Germany

**Table 3: Consumers' tomato sauce attributes of liking and disliking in Germany**

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none"> <li>▪ Onion taste</li> <li>▪ Bouillon soup taste</li> <li>▪ Filled appearance</li> <li>▪ Other tastes</li> <li>▪ Oregano taste</li> <li>▪ Pepper taste</li> <li>▪ Garlic taste</li> <li>▪ Herbal appearance</li> <li>▪ Sweet taste</li> <li>▪ Green herbal taste</li> <li>▪ Spicy mouthfeel</li> <li>▪ Green herbal odour</li> <li>▪ Basil taste</li> <li>▪ Bouillon soup aftertaste</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bite mouthfeel</li> <li>▪ Tin/metallic odour</li> <li>▪ Tin/metallic taste</li> <li>▪ Tomato puree odour</li> </ul>

## Italy

**Table 4: Consumers' tomato sauce attributes of liking and disliking in Italy**

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none"><li>▪ Cooked fresh tomato taste</li><li>▪ Cooked fresh tomato odour</li><li>▪ Filled appearance</li><li>▪ Filled mouthfeel</li><li>▪ Sweet taste</li></ul>	<ul style="list-style-type: none"><li>▪ Tomato puree taste</li><li>▪ Tomato puree odour</li><li>▪ Mouldy/earthy odour</li><li>▪ Salty taste</li><li>▪ Coloured appearance</li><li>▪ Tin/metallic odour</li><li>▪ Tin/metallic taste</li><li>▪ Bitter taste</li><li>▪ Intense taste and aftertaste</li></ul>

## Netherlands

**Table 5: Consumers' tomato sauce attributes of liking and disliking in the Netherlands**

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none"><li>▪ Garlic taste</li><li>▪ Green herbal odour</li><li>▪ Green herbal taste</li><li>▪ Herbal appearance</li><li>▪ Basil taste</li><li>▪ Basil odour</li><li>▪ Onion taste</li><li>▪ Intense odour</li><li>▪ Intense taste</li><li>▪ Pepper odour</li><li>▪ Onion odour</li><li>▪ Cooked fresh taste</li><li>▪ Oregano taste</li></ul>	<ul style="list-style-type: none"><li>▪ Mouldy odour</li><li>▪ Tin taste</li><li>▪ Tin odour</li></ul>

## Poland

**Table 6: Consumers' tomato sauce attributes of liking and disliking in Poland**

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none"><li>▪ Aftertaste intensity</li><li>▪ Pepper odour</li><li>▪ Onion odour</li><li>▪ Garlic odour</li><li>▪ Intense odour</li><li>▪ Onion taste</li><li>▪ Green herbal taste</li><li>▪ Green herbal odour</li><li>▪ Pepper taste</li><li>▪ Bouillon soup taste</li><li>▪ Herbal appearance</li><li>▪ Oregano taste</li><li>▪ Basil odour</li><li>▪ Oregano odour</li></ul>	<ul style="list-style-type: none"><li>▪ Cooked fresh tomato odour</li></ul>

## 4 Label effect

An effect of the organic label (label effect) on consumers' liking of tomato sauce was found in Germany, the Netherlands and in Switzerland, while in Italy and France, no clear impact of the organic label on the overall liking of tomato sauce was found.

A strong positive label effect indicates a positive image of the product characteristic 'organic'. In such cases, it is promising to highlight the attribute 'organic' as a unique selling proposition when marketing the product. In cases of no or even negative label effects, product improvement is required.

### France

No organic label effect was found in relation with the tomato sauce samples tested in France. Hence, the organic label plays a minor role with regard to overall liking of tomato sauces. At the same time, no differences were found regarding the scoring of the heavy and light users, neither in the blind (without labelling) nor in the branded test (with labelling).

Against this background, a promising marketing strategy is to inform consumers about specific sensory properties of organic tomato sauce rather than pointing out 'organic' as a unique selling proposition.

### Germany

With few exceptions, organic tomato sauce samples are ranked higher by consumers in the branded compared to the blind test. Even the conventional sample is evaluated better with regard to overall liking with the organic label. Also, the organic sample with a conventional label resulted in better scores in the branded test. Hence, both the organic and the conventional labelling lead to better results in the branded compared to the blind test.

Differences between German heavy and light users were not detectable, whereas in the blind test, heavy users scored slightly higher for both the organic and the conventional tomato sauces.

The strong label effect indicates the positive image of organic tomato sauce. Highlighting 'organic' as a unique selling proposition for tomato sauce represents a promising marketing strategy in Germany.

### Italy

The organic tomato sauce samples were scored higher in the labelled test by Italian consumers. However, only in one case, this difference was significant. Regarding the comparison of the results of heavy and light users, no differences were found in the blind test, whereas in the branded test a slight tendency of higher scores for both organic and conventional tomato sauces by the heavy users is observable, though the differences were not significant.

A reason for the low labelling effect can be seen in the high importance of sensory properties for the buying decision of Italian consumers. As none of the tomato sauces in the sensory analysis within the project ECROPOLIS reached a high acceptance through the consumers, probably the organic label could not change their mainly negative evaluation of the tested products. Given the low overall acceptance of (both conventional and organic) tomato sauce – at least in relation with the samples tested within the ECROPOLIS project – a product improvement strategy is recommended.

## **Netherlands**

In one of the tomato sauce samples tested in the Netherlands, there was a positive organic label effect, while for other cases, no effect or even a positive conventional label effect was found. A possible explanation for the small effect of the organic label on consumers' evaluation of tomato sauce in the Netherlands is that Dutch consumers prefer raw products in organic quality, but do not appreciate processed organic food, such as tomato sauce. This, especially, holds true for heavy users of organic food. Hence, the trend of the heavy users in the sensory analysis was a lower ranking for organic tomato sauce, both in the blind and in the branded sensory tests within the ECROPOLIS project.

No clear difference between heavy and light users regarding the overall liking, as well as no influence of the organic label was found.

Given the rather negative sensory image of processed organic products among Dutch consumers, professional product improvement and sensory promotion is a promising strategy.

## **Poland**

In Poland, the organic label led to higher scores in the branded test with the exception of one sample. In comparison to that, the conventional label led in two cases to lower scores and in one case to slightly higher scores. However, these differences were not significant. Thus, it can be concluded that the organic label effect in relation with tomato sauce is low in Poland.

With regard to the comparison of heavy and light users, neither in the blind test nor in the branded test, differences between them were found. This is due to the fact that the organic market in Poland is still in an early development stage so that the availability of organic products is limited. Consequently, the consumption patterns of Polish heavy and light users do not differ as much as it is the case in other countries.

Consumer research showed that Polish organic consumers have a very idealistic and positive picture of organic agriculture. This positive image should be highlighted in the communication strategy for tomato sauce.

## 5 Strategic options regarding product development and communication measures for organic tomato sauce

Table 7 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 7: Strategic options with regard to product development and communication**

TOMATO SAUCE Strategic options	Imitation / standardisation strategy	Differentiation strategy (freshness, authenticity)	Country specific issues
<b>Product development</b>	<ul style="list-style-type: none"> <li>Standardised taste, odour comparable with conventional benchmark products.</li> <li>Ensure appropriate cooked fresh-tomato taste: higher in CH; DE, FR, IT and NL; medium in PL.</li> <li>Ensure appropriate thickness (not mentioned in IT and NL).</li> </ul>	<ul style="list-style-type: none"> <li>Differentiation difficult as already highly processed. In some countries use of specific herbs or use of handcrafts techniques or traditional recipes.</li> <li>Consider herbs-like taste in NL and PL.</li> </ul>	<ul style="list-style-type: none"> <li>Different expectations regarding taste and texture (see product improvement strategies)</li> </ul>
<b>Communication measures</b>	<ul style="list-style-type: none"> <li>Standardisation might be a first step in entering the market.</li> </ul>	<ul style="list-style-type: none"> <li>Communication of specific processing attributes difficult.</li> <li>Emphasis on traditional handcraft (versus industrial) processing or natural ingredients, specific origin, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Preference for organic tomato sauce in DE and IT:</li> <li>Preference for conventional tomato sauce in PL, FR, NL (CH not surveyed).</li> <li>Positive influence of organic labelling in DE</li> <li>Low or no influence of organic labelling in FR, IT, NL, PL (CH not surveyed): use more other attributes than organic in communication.</li> </ul>

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

Check points	Yes	No	Don't know
<b>Raw material:</b>			
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?			
<b>Additives:</b>			
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. certain thickeners) be replaced or other measures taken to improve the sensory quality?			
<b>Processing aids:</b>			
Are the processing methods allowed by the regulations and private organic standards (e.g. no GMO)?			
Are all processing steps really needed?			
<b>Packaging:</b>			
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?			
<b>Labelling:</b>			
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)?			
<b>Sensory Marketing:</b>			
Could the restrictions on flavouring ingredients and their consequences on tomato sauce taste and odour be used in marketing in a positive way?			
Could the restrictions on thickening ingredients and their consequences on tomato sauce 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>.