

Fact sheet about sensory properties of organic apples

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

Deliverable 6.3

FiBL Switzerland



Consumers' sensory preferences for organic apples



France

Organic consumers in France prefer apples with a crispy and firm texture.

Germany

German organic consumers prefer apples of the varieties Elstar and Gala with a comparably high sweetness, a rather low intensity of ripe odour and a crispy texture.

Italy

Italian organic consumers prefer the apple variety Pink Lady, which has a sour, grassy, green apple-like taste, as well as a crispy, firm, not so mealy odour.

Poland

Polish organic consumers prefer the varieties Jonagored and Ligol, which show big differences in their sensory characteristics. In general, consumers prefer rather sour apples with lemon, fruity and ripe odour and an astringent aftertaste.

Switzerland

Swiss organic consumers prefer Gala apples with a very sweet and cooked apple-like taste, a ripe and fruity odour as well as a mealy texture.

Sensory properties of organic apples

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 farming 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

With regard to the cultivation measures, the EU regulations and the Swiss governmental regulations for organic food production, and private organic standards have detailed requirements. The use of fertilisers and pesticides is restricted to specific substances listed in the annexes of the respective standard. In most private standards, the list is more limited compared to EU regulations and Swiss governmental regulations.

Linkages between the regulatory requirements and the results of the sensory analysis of apples could not be made within the ECROPOLIS project due to the situational influence factors impacting the sensory quality of apples, such as climatic and soil conditions during production.

2 Factors that influence the sensory characteristics of apples

The extrinsic and intrinsic quality of apples is influenced by several factors, such as

- Genes of a variety
- Climatic conditions
- Site-specific conditions, such as soil conditions
- Cultivation measures, such as plant density, canopy management, system stabilisation (e.g. hedges), fertilisation, weed control, disease and pest control
- Optimal harvest date
- Storage conditions

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

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

France

Table 1: Consumers' apple attributes of liking and disliking in France

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Crispy texture▪ Firm texture	<ul style="list-style-type: none">▪ None

Germany

Table 2: Consumers' apple attributes of liking and disliking in Germany

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Juicy texture▪ Crispy texture▪ Sweet taste	<ul style="list-style-type: none">▪ Mealy texture

Italy

Table 3: Consumers' apple attributes of liking and disliking in Italy

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Lemon fruit taste▪ Grass taste▪ Sour taste▪ Firm texture▪ Sour appearance▪ Green apple taste▪ Crispy texture	<ul style="list-style-type: none">▪ Mealy texture▪ Lemon fruit odour▪ Cooked apple taste

Poland

Table 4: Consumers' apple attributes of liking and disliking in Poland

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Lemon fruit odour▪ Fruity odour▪ Ripe odour▪ Astringent aftertaste▪ Sour taste▪ Green apple odour	<ul style="list-style-type: none">▪ Grass odour▪ Grass taste▪ Bitter taste▪ Cooked apple taste

Switzerland

Table 5: Consumers' apple attributes of liking and disliking in Switzerland

Attributes of liking	Attributes of disliking
<ul style="list-style-type: none">▪ Ripe odour▪ Fruity odour▪ Fruity taste▪ Sweet taste▪ Cooked apple taste	<ul style="list-style-type: none">▪ Grass taste▪ Green apple odour▪ Green apple taste▪ Bitter taste▪ Sour taste▪ Sour aftertaste

4 Label effect

An effect of the organic label on consumers' liking of the product (label effect) was found in Italy, Poland and Switzerland, while the effect was weak or not found in France and Germany. 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 where no or even negative label effects were seen, product improvement is required. Processors and providers of organic apples can find general recommendations for organic apple improvement and information on country-specific sensory preferences in report D 5.3.

France

No clear label effect was found in relation with apples in France: both the organic and the conventional label led to slightly higher scores in overall liking. Differences in overall liking in the blind (without labelling) and the branded test (with labelling) between heavy and light users were not seen.

Since the variety and the variety-specific sensory attributes are most relevant for the consumers' buying decisions of apples, sensory marketing is a promising strategy.

Germany

In Germany, the organic label had a slightly positive effect on six out of eight organic apples, but these differences were not significant. Differences in overall liking in the blind (without labelling) and the branded test (with labelling) between heavy and light users were not seen. Thus, the variety-specific taste is valid both for organically and conventionally produced apples.

Since the variety and the variety-specific sensory attributes are most relevant for the consumers' buying decision of apples, sensory information on the different apple varieties is a promising communication strategy.

Italy

In Italy, organic apples received slightly higher scores in the branded test, but only in the case of organic apple variety Pink Lady was the label effect significant. But also the conventional label led to higher scores in the branded tests so that, in general, both organic and conventional organic apple samples labelled as conventional reached higher ratings in the branded test. Interestingly, the Italian heavy users tended to score organic apples lower both in the blind and in the branded test. However, the differences were not significant.

Since the variety and the variety-specific sensory attributes are most relevant for the consumers' buying decision of apples, sensory information on the different apple varieties is a promising communication strategy.

Poland

The effect of the organic and the conventional labelling was not consistent. Although the three organic samples in the sensory testing scored higher in overall liking in the branded test, the conventional apple labelled as organic was evaluated even worse with the label compared to the blind test. The conventional label led in two cases to lower scores and in one case to higher scores. The tendency for higher scores with the organic label was the highest in Poland compared to the results in the other countries. This can probably be explained by the very positive image of organic agriculture in Poland. Differences in scoring between heavy and light users were not significant, but heavy users tended to score lower both for organic and for conventional apples in the blind and in the branded test.

The strong label effect among Polish organic heavy users indicates the positive image of the attribute 'organic' in relation with apples. Thus, highlighting 'organic' as a unique selling proposition, is a promising marketing strategy. This strategy is particularly successful in shops that are frequented by organic heavy users. Particularly in shops frequented by average consumers, sensory information about different varieties is a promising communication strategy, since the variety-specific sensory attributes are relevant for consumers' buying decision of apples.

Switzerland

Both organic and conventional labelling had an influence on the apple samples' ranking of the consumers and, therefore, no significant differences were found. Two out of five organic apples scored higher in the branded test with the organic label compared to the results of overall liking in the blind test. Regarding the comparison of Swiss heavy and light users, heavy users scored organic apples slightly higher in the blind and in the branded tests.

In the consumer research within the ECROPOLS project, Swiss consumers pointed out that they expect a more intense, variety-characteristic taste of organic apples with a superior taste and superior smell. However, the results of the sensory analysis showed that taste of organic apples was, in general, not more intense than that of conventional apples. The characteristic taste of the variety occurred also with the conventional apples. Therefore, consumers' perception cannot be confirmed based on the results of the trained panel in the sensory test.

Swiss consumers pointed out that they would be interested in sensory information concerning the suitability of certain apple varieties for specific purposes, such as for cooking. Thus, sensory information on different apple varieties is a promising communication strategy in this country.

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

Table 6 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 6: Strategic options with regard to product development and communication

APPLES Strategic options	Imitation / standardisation strategy	Differentiation strategy (freshness, authenticity)	Country specific issues
Product development	<ul style="list-style-type: none"> Ensure appropriate country-specific preferred taste: high importance in FR, IT, NL; medium in CH, DE and PL). Apples should be consumed in the optimum maturity stage. 	<ul style="list-style-type: none"> Multiple differentiation possibilities: in particular with regard to choice of varieties, packaging, 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"> Inform consumers about “best before date” (immediate consumption or possibility to store longer). 	<ul style="list-style-type: none"> Consider and communicate country-specific preferred characteristics and preferences (e.g. local varieties). Make consumer tasting in shops. Offer training for sales staff. Introduce special labelling system for taste for different flavour groups of apple varieties/cultivars. 	<ul style="list-style-type: none"> Preference for organic apples in DE, CH, IT: Preference for conventional apples in PL, FR (NL not surveyed). Positive influence of organic labelling in PL. Low or no influence of organic labelling in DE, CH, IT, FR and (NL not investigated): use more other attributes than organic in communication

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

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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.

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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>.