



# Taste, Freshness and Nutrients

## Information to Retailers regarding Control of Quality and Safety in Organic Production Chains

Alberta Velimirov, Paolo Bergamo, Lorna Lück and Kirsten Brandt



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This leaflet provides a practical overview for retailers of what is done to secure the quality and taste of seven types of organically produced foods, where improvements are possible, and what the retailers can do to support improvements and ensure the best possible food quality. Other leaflets for retailers cover authenticity and fraud or safety and contamination, and separate leaflets aim at consumers or at production of specific commodities.



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## The Organic HACCP Project leaflets

This is no. 1 of a series of 14 leaflets comprising information on how control of quality and safety can be further improved in organic supply chains across Europe. The Organic HACCP project has reviewed studies of consumer concerns and preferences in relation to organic production systems and collected information about typical production chains for seven commodities in regions across Europe. For each of the criteria listed below, the information was analysed to identify Critical Control Points (CCPs), defined as the steps in supply chains where the qualities of the final product can be controlled most efficiently. CCPs were identified using methods developed for Hazard Analysis by Critical Control Points (HACCP), a standard procedure to prevent food safety risks. The new aspect is thus to improve how consumer concerns are addressed, through the use of the CCP concept for a wide range of criteria, not only safety.

## Overview of the Criteria Examined

The analysis was done for the following seven criteria:

1. Microbial toxins and abiotic contaminants
2. Potential pathogens
3. Natural plant toxicants
4. Freshness and taste
5. Nutrient content and food additives
6. Fraud
7. Social and ethical aspects.

The project analysed 29 organic supply chains in Europe for tomatoes, eggs, cabbage, wine, milk, apples and wheat bread. On the project's homepage ([www.organichaccp.org](http://www.organichaccp.org)) each chain and the relevant Critical Control Points are described in detail. The present leaflet gives an overview of the outcome of the analysis for the positive aspects of food quality: freshness, taste and nutrients. Two other leaflets for retailers are "Authenticity & Fraud", and "Safety & Contamination". Other leaflets address producers, consumers, etc.

### General issues relating to freshness

*Freshness* can refer to time, how long ago the cow was milked, the apple was picked or the bread was baked. Or it can refer to the expected shelf life: the fresher the food, the longer it will take before a tomato rots or an egg becomes "runny". Freshness can thus be self-contradictory: are apples more fresh when storage in controlled atmosphere allows them to stay fresh for much longer? So to assess how freshness is preserved or improved, what is meant by freshness must be defined in each case. It is then relatively easy to determine which products are the freshest ones.

### General issues relating to taste

*Taste* as a quality is on one hand clearly defined, it is the pleasure experienced by eating a food. But since it depends on the person who is eating, it is difficult to measure and agree on. However, good taste quality is generally indicated by a full, rich taste, while a bland taste or taste components associated with mould, rancidity or other types of spoilage usually indicate poor taste quality.

### General issues relating to nutrient content

*Nutrient content* superficially appears easy to understand and measure, as the content of vitamins, minerals, fibres etc. However, when assessing the impact of a process in the supply chain, e.g. temperature during storage, the level of one nutrient often increases while another decreases. Since it is most often not known which nutrient is most important for human health, an unequivocal consequence for nutritional quality can be defined only in a few cases.

## Animal Products (eggs and milk)

The use of grass or other fresh green plant material as feed increases the content of carotenoids in both eggs and milk, which is generally considered a nutritional advantage. In milk it also improves the taste of the fresh product and increases the levels of polyunsaturated fatty acids (PUFAs) and other lipids considered to provide a nutritional advantage, but a high content of PUFAs can increase the risk of development of a rancid off-taste during storage. Grazing on wild herbs can further improve the aroma and flavour. It is not yet known if these effects apply for eggs as well.

The freshness at the time of sale, measured as time since milking or laying, is variable and only few retailers provide information about this, normally the label only carries a "best before" date. Often milk is collected from the farm only every other day, for eggs the interval can be up to one week, in these cases the production date is difficult to define clearly.

Homogenisation is to pass milk through a filter at high pressure to break its fat globules into small pieces, which remain suspended in the milk rather than collecting as cream on the surface. It changes the appearance and taste of milk, although opinions differ on if it is an improvement. The EU food labelling rules do not specify information about homogenisation, so in some countries this is not compulsory.

Eggs become "runny" if kept too long at high temperature.

## Recommendations

- Ask your supplier about the use of pastures, homogenisation and the date of milking/laying, and display this information to the consumers.
- Buy eggs as fresh as possible, store and display under cool conditions, not warmer than earlier in the chain, in particular protect against rapid changes in temperature.

## Plant Products (cabbage, tomatoes and apples)

The plant variety is the most important determinant of taste. It is difficult to breed a variety that combines excellent taste with very high yield, so the varieties with the richest taste are normally more expensive than those with average (more bland) taste. Increasing yield by intensive fertilisation can “dilute” the taste and sometimes also the nutrient content.

The next most important aspect is the maturity at harvest and conditions during storage and transport. The best taste is obtained when the product is allowed to reach full maturity on the plant before harvest, and is then consumed shortly after.

For cabbages and apples this means that freshly harvested material of each variety is only available for a few weeks in a year. Since medium duration cold storage only slightly reduces quality, most cabbages and apples sold have been extensively stored and/or transported, however, eventually the taste and nutrient content declines.

For tomatoes, cold storage drastically reduces taste. To prevent this, supply chains can use a “fast track” system, where mature tomatoes are picked directly into the display trays and quickly distributed to the retailers without cooling.

## Recommendations

- Ask your supplier about variety name and harvest date, and display this information to the consumers.
- Try to obtain different varieties when they are best during the season – this is normally when they are cheapest!
- Display and store tomatoes at room temperature (never below 14°C), particularly if picked mature or on the vine.
- Processed Products (bread, wine)

As above, quality of raw materials depends on variety and growth conditions and the best quality is linked with relatively low yield, causing a higher price. The taste and nutrient content also depends on maturity at harvest, processing methods and storage conditions before, during and after processing, resulting in a wide range of types and qualities at very different cost levels. For both bread and wine, a careful optimisation of the entire production process is necessary to ensure very good taste, but it is difficult to inform about details of this, so as retailer it is particularly important to choose suppliers that you know provide good quality.

Bread loses taste quickly after baking, but some types, e.g. wholemeal bread, keep the taste longer than the “fluffy” types. “Half-baked” products provide freshly baked bread, but the best taste requires use of high quality raw materials.

## Recommendations

- Ask your supplier about variety name and production methods, and display this information to the consumers.
- Provide information about the special qualities of each product, such as which ones must be consumed fresh and which ones can be kept longer.

## Overall conclusion and recommendations

Arrange tasting sessions where you give consumers the opportunity to compare and rank taste and appearance of a range of products. Advertise the tasting session in advance, display the result in the shop, and send it to your suppliers.

Exchange information about your quality control and quality measurements with the companies and persons in charge of the other parts of the chain. Formal or informal collaboration agreements can ensure that quality and safety is controlled at every step of the supply chain, and that the costs of this are shared fairly among the participants.

## Continuation in the QLIF project

The work of Organic HACCP identified several areas where more research is needed to understand the quality of organic products and to find better ways to fulfill consumer expectations. In 2004 the project QualityLowInputFood (QLIF, [www.qlif.org](http://www qlif.org)) was started to broaden and deepen the understanding of quality of organic food. QLIF is an Integrated Project in the European Commission’s 6<sup>th</sup> Framework Programme with 31 participants in 15 countries. QLIF is a 5-year project aiming to provide research and development on quality, safety and efficiency of organic and other low-input farming methods in Europe.

The following topics relevant for quality and taste will be investigated in QLIF:

- Studies of relations between different aspects of food quality, consumer perceptions and buying behaviour (Consumer expectations and attitudes, 2004-2007).
- Studies of effects of production methods on taste of apples, wheat bread and milk, and nutritional quality of these products as well as a range of vegetables (Effects of production methods, 2004-2008).
- Development of HACCP procedures for control of quality and safety in organic supply chains and training courses for advisors (Transport, trading and retailing, 2006-2008).

## Editorial Notes

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- FiBL, Ackerstrasse, CH-5070 Frick, Tel. +41 62 865 7272, Fax +41 62 865 7273, e-mail [info.suisse@fibl.org](mailto:info.suisse@fibl.org), Internet [www.fibl.org](http://www.fibl.org)
- University of Newcastle, Agriculture Building, UK – NE1 7RU, Newcastle upon Tyne, e-mail [organic.haccp@ncl.ac.uk](mailto:organic.haccp@ncl.ac.uk), Internet [www.ncl.ac.uk/tcoa/](http://www.ncl.ac.uk/tcoa/)

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A PDF version can be downloaded free of charge from the project Internet site at [www.organichaccp.org](http://www.organichaccp.org) or from <http://orgprints.org/view/projects/eu-organic-haccp.html>. Printed versions can be ordered from the FiBL Shop at <http://shop.fibl.org>.

## Authors

Alberta Velimirov (LBI), Paolo Bergamo (ISA), Lorna Lück and Kirsten Brandt (UNEW).

Contact:

Dr. Alberta Velimirov, Ludwig Boltzmann Institute for Biological Agriculture (LBI), Department of Product Quality, Rinnböckstr. 15, A-1110 Vienna, Austria, Tel. +43 1 79514 97946, Fax +43 1 79514 99 97940, e-mail [albiveli@yahoo.com](mailto:albiveli@yahoo.com), Internet [www.geocities.com/bioqualitaet/](http://www.geocities.com/bioqualitaet/)

## About Organic HACCP

The main objectives of this Concerted Action are to assess current procedures for production management and control in organic production chains, with particular reference to the characteristics valued by consumers, and from this to formulate and disseminate recommendations for improvements.

The two-year project started in February 2003. The results of the project, including a database of Critical Control Points in the analysed chains, are available on the project website [www.organichaccp.org](http://www.organichaccp.org).

## The Project Partners

- University of Newcastle (UNEW), Newcastle upon Tyne, United Kingdom.
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- Ludwig Boltzmann Institute for Biological Agriculture (LBI) Vienna, Austria.
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