Info Organic HACCP

ORGANIC HACCP

Production of Tomatoes

Control of Quality and Safety in Organic Production Chains

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This leaflet provides a practical overview for producers and others involved in tomato production and packaging, of what can be done at these steps to improve quality and safety of organically produced tomatoes, in addition to certification and general food safety requirements. Other leaflets cover production of other commodities and separate leaflets aim at consumers and retailers.

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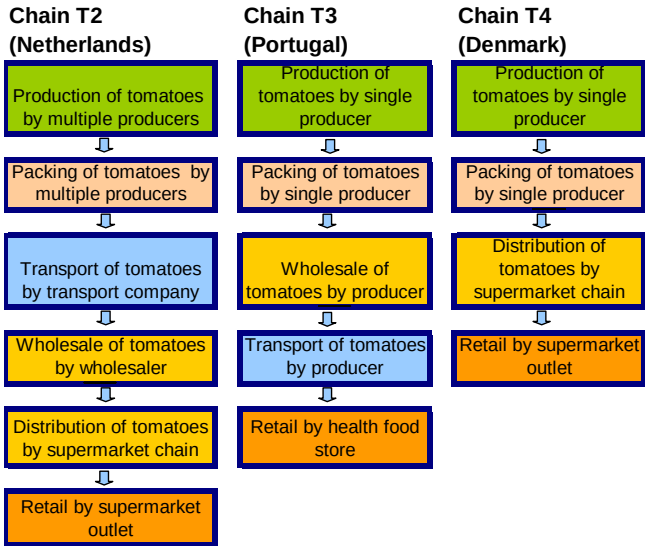
The Organic HACCP Project leaflets

This is no. 12 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 7 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.

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

Overview of the chains examined for tomatoes



The diagram shows the analysed organic supply chains for tomatoes throughout Europe. On the project's homepage (www.organichaccp.org) they are shown in more detail and each of the CCPs are shown and described.

Variety selection

Important issues to control at this step

The variety is very important for taste, appearance and shelf life of tomatoes. However, varieties with very good taste, appearance and shelf life often do not give the highest yield.

Specific problems for organic production

Many consumers of organic tomatoes prefer to have a choice of traditional and/or local varieties with different tastes and uses. At the same time the marketing and retail business demand large batches of uniform products.

Resistance to diseases and pests is very important for organic growers, in particular to root diseases (in greenhouse production) and late blight (*Phytophtora*) (for outdoors production).

Recommendations

- Select varieties with good taste and low susceptibility to relevant diseases.
- If data from organic variety trials in the region are not available, try to organise small-scale trials by yourself or together with other organic farmers. Include testing of taste and resistance.
- Make arrangement with other organic producers to try to assist to cover large orders when needed and possible.

Crop management

Issues important to control at this step

High rates of nitrogen supply favour pathogen development, whereas relatively low nitrogen supply appears to result in better product quality (taste and resistance to rot).

Tomatoes may be consumed raw, so any contamination with pathogenic bacteria must be prevented.

Specific problems for organic production

Organic greenhouse tomatoes are grown in soil, rather than Rockwool. In permanent greenhouses it can be difficult to prevent accumulation of root pathogen spores in the soil.

Some consumers find intensive greenhouse production with high input of energy and high fertiliser application rates, at odds with the organic ideals.

In outdoor production, the fungal disease late blight, *Phytophtora,* has traditionally been controlled by the use of copper salts, also in organic farming. The use of copper-based pesticides is a problem for the image of organic farming among consumers, and many retailers demand copper-free production. On some farms, spray drift by less careful conventional neighbours may result in contaminated produce. It is the organic farmer who needs to take action to prevent any contamination of his/her products.

Recommendations

- Minimise the use of N containing fertiliser, even organic types, and use alternative sources of energy for heating.
- Try to establish relevant crop rotations, e.g. by using movable greenhouses and intercropping.
- If overhead sprinklers are used for irrigation, do not use water from open reservoirs (where birds have access).
- Use less than the permitted amount of copper (or none) and prepare for copper-free production in the future.
- Apply indirect measures to avoid pests and diseases and to prepare for copper-free production: the use of resistant varieties; the provision of habitats for beneficial organisms; the use of trap crops - intercropping or along the field margins; the use of plants as insect repellents (mint, garlic, onion, sage, coriander, chives, anise, marigold).
- Establish hedges or other barriers to protect the crop from spray drift from neighbours, and promote merging of small areas with organic fields including exchange of land.
- If pesticides can have drifted onto your field, get a leaf sample analyzed. If residues are found, either i) ask your conventional neighbour to buy the affected tomatoes from you for the same price as organic and cost of the analysis, or ii) agree with neighbours on safety measures such as spraying only under certain wind conditions with well maintained equipment, or using only substances allowed in organic farming on part of the conventional field.

Harvest and packaging

Issues important to control at this step

Tomatoes allowed to ripen on the plant develop much better taste and last longer after purchase by the consumer than when picked green or only partially ripe. However, they are more susceptible to mechanical damage if handled.

Information to consumers on who has produced and packed a product and when it was harvested, shows willingness to take responsibility, allows calculation of food miles and freshness and reduces the risk of fraud.

Chilling of tomatoes (exposure to temperatures of less than 12 °C) causes rapid deterioration of the taste.

Specific problems for organic production

Often organically certified central facilities for sorting and packaging are not available in the local area.

Some large-scale sorting and packaging facilities are parallel operations, certified to handle both organic and conventional products. This gives a risk of accidental mixing with conventional tomatoes or use of non-allowed agents.

Recommendations

- Harvest the fruit as ripe as possible and as far as possible place directly in container (e.g. box or tray) used for display, to avoid damage due to handling.
- If possible, use nets rather than plastic film for packaging.
- When packaging, use labels with the name and address of the producer, preferably also date of harvest.
- Keep the product at 14°C - 18°C after harvest, and suggest to your customers to also establish systems to protect against too low temperatures, to preserve the quality all the way to the consumer.
- Provide (truthful!) information about the production facilities and ideals, e.g. on a website, with a link on the label.
- Monitor and document both organic and non-organic activities (input-output reconciliation) when relevant.

Overall Recommendations

Ask the companies and persons in charge of the other parts of the chain for their results when they assess the final product quality. It is in their interest as well that you use such feedback to improve your procedures. Formal 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 in which more research is needed to improve the control of quality and safety of organic products. In 2004 the project QualityLowInputFood (QLIF, 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 6th 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 production of tomatoes 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).
- Development of cost-effective methods to improve quality and productivity (Crop production systems, 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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Bibliographical Information

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A PDF version can be downloaded free of charge from the project internet site at www.organichaccp.org or from www.orgprints.org/view/projects/eu-organic-haccp.html..

Printed versions can be ordered from the FiBL Shop at www.shop.fibl.org.

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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 2-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.

The Project Partners

- University of Newcastle (UNEW), Newcastle upon Tyne, United Kingdom.
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- National Institute for Consumer Research (SIFO), Oslo, Norway.