



Egg Production and Packaging

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 egg production and packaging, of what can be done at these steps to improve quality and safety of organically produced eggs, in addition to certification and general food safety requirements. Other leaflets cover production of other commodities and separate leaflets aim at consumers and retailers.

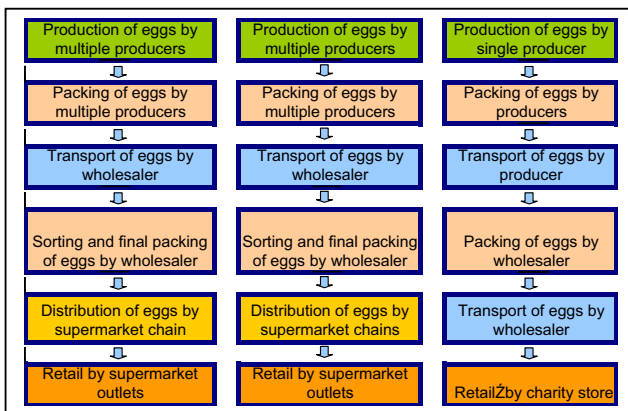


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The Organic HACCP Project leaflets

This is no. 8 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 eggs



The diagram shows the analysed organic supply chains for eggs 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.

Feed quality and composition

Important issues to control at this step

Some fungal diseases, such as *Fusarium* and *Penicillium* can produce mycotoxins, which can damage animal or human health, if they occur in the grain or after the feed is produced. The toxic industrial pollutants dioxins can occur in feedstuffs. The feed composition, in particular the content of fresh grass and herbs, affects taste, appearance (colour)

and nutritional value of eggs. Rodent infestation can be a source of pathogens.

Recommendations

- Ensure that the feed storage facilities are kept clean, tidy and rodent free, ensure good control of humidity and temperature, even during adverse weather conditions.
- Check feed on arrival and each subsequent week for appearance (smell and colour). Measure humidity and temperature and plot the values on a chart. Act immediately if the values become too high, before any sign of mould appear. Discard feed that smells or looks mouldy.
- Use oldest feed first.
- Check with your feed supplier for results of analysis on dioxins and mycotoxins, and consider testing for dioxins in own produced feed if produced near an industrial site.
- Manage outdoor runs as "pastures" to ensure that the layers have regular access to fresh grass, or give them other fresh plant material as appropriate for the season.

Management of hens

Important issues to control at this step

Pathogens (mainly *Salmonella*) can contaminate the flock, and hence the eggs, directly or indirectly from faecal material of infected animals or birds in or near the production area, including via contaminated water. Dioxin in eggs can come from contaminated soil and grass in the chicken run or general intake of airborne particles. Dioxins accumulate in the bird's body over time.

Specific problems for organic production

The outdoor runs means that some level of contact with other animals is inevitable.

Recommendations

- Minimise the presence of wild birds and rodents in both the chicken run and feed storage area.
- Protect the chicken run and in particular water sources and feeders from possible runoff from places where wild animals occur. Imagine the consequences of the worst possible weather before deciding on the design of outdoor facilities.
- Buy the chickens from sources where they have similar out-doors facilities, or raise them yourself, to support their development of resistance against the pathogens they are likely to encounter.
- Limit the age of the layers to 2 laying periods.
- Consider if a site for organic egg production is on or near former industrial sites or incinerators and if so, test for dioxin and other persistent chemicals in the soil.

Collection and on-farm storage of eggs

Important issues to control at this step

If *Salmonella* are present in the eggs, they can multiply to very high levels in a short time under favourable conditions (e.g. 20 - 40°C).

Growth of *Salmonella* at different storage temperatures:

Temperature (°C)	Time (h) taken to increase 1000-fold, in eggs (or in culture broth)
25	18
16	35
10	97
5	No increase in 40 h
4	480 (measured in culture broth)

Data source: <http://www.combase.cc/>

Loss of taste and consistency (the eggs whites become “runny”) also happens faster the higher the temperature. Consumers find it important to know the freshness of the eggs they buy.

Specific problems for organic production

Consumers are concerned about the risk of fraud, especially when organic eggs are much more expensive than those produced conventionally.

Recommendations

- Collect eggs frequently, and stamp the date of collection with an organic logo on each egg.
- Ensure that the eggs are cooled as soon as possible after collection and kept at a constant low temperature, as specified in national standards for good practice.
- Ensure that the on-farm storage facilities have sufficient excess capacity to keep all eggs cooled as long as they stay at the farm, in particular during unusually hot weather.

Packaging and transport to retail

Important issues to control at this step

For the consumer, the packaging is often the primary source of information about the entire production chain. Indications of willingness to take responsibility for the product are important determinants for trust. A well-known brand is trusted more than a completely anonymous product, while disclosure of the identity of the producer is often seen as even further proof of commitment.

Specific problems for organic production

Consumers of organic products are particularly concerned with issues such as transparency and honesty in food production, and they often support local production.

Recommendations

- Identify the producer on each package, not only by an anonymous number, but by address or phone number (defining area of origin), name and perhaps a picture.
- Pictures and other descriptions on the package or other promotion material (e.g. advertisements) should illustrate how the actual production facilities look, not a fairy tale landscape. Inform clearly if the pullets you buy are organic or conventional, and why you made this choice.
- Ensure that cooling is maintained throughout packaging and transport, in particular avoid temperature changes.

General Recommendations

Exchange information about your quality control and their 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 improve the control of quality and safety of organic products. In 2004 the project QualityLowInputFood (QLIF, www.qlif.org) was started to broaden 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 quality and safety of egg production 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 growing conditions and variety choice on mycotoxin contamination of wheat (Effects of production methods, 2004-2008).
- Development of seed treatments to prevent transmission of Fusarium (Crop production systems, 2004-2008).
- Development of improved preventive management strategies and alternative treatment strategies for endo- and ectoparasites, bacterial zoonoses of poultry and for rodent control (Livestock 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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