

AuthenticFood

Fast methods for authentication of organic plant products



Main research questions:

The aim of AuthenticFood is to be able to discriminate between organic and non-organic plant-based foodstuffs using a portfolio of the most promising analytical methods.

Research hypotheses:

- i) Organic plant samples can be authenticated at the field and farm levels under conditions where bias is introduced by differences caused by e.g. farming practise, geographical location, plant cultivar and growth season.
- ii) Authentication of the organic origin is maintained in processed cereal and vegetable samples when data from suitable analytical methods are applied and combined.
- iii) The methods can be implemented by relevant stakeholders such as inspection and certification bodies.



Main outcomes at this stage?

A wide range of analytical methods have been developed and validated for authentication of organic plant products. These have been applied to plant samples from Danish and Italian field trials and independent test-set samples. It has been shown that several analytical methods have the potential to authenticate the geographical and/or the agricultural origin of plant products.

Multi-element fingerprint analysis is particularly suitable for revealing where a plant has been grown due to the inherently different soil mineralogy of geographical locations across Europe. When zooming in on individual elements by stable isotope analysis it is also possible to reveal how a plant has been fertilized – especially when focusing on isotopes of specific plant compounds such as amino acids and oxygen containing nutrients. Metabolomic profiling has also proven valuable for discriminating between organic and conventional plant products when combined with multivariate statistics. The final chemical and statistical analyses are now pending and on this basis a portfolio of the most suitable combinations of analytical methods and parameters for specific plant products will be presented. The final project period will also focus on the practical implementation and dissemination of project findings to relevant stakeholders and end-users.

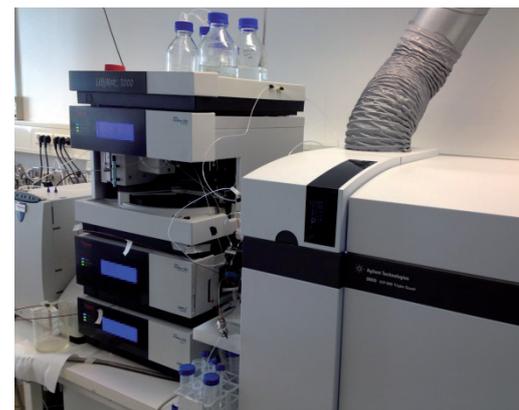


Recommendations to end-users

Based on the preliminary findings of AuthenticFood it is recommended that the existing inspection and certification systems of the organic sector are supplemented by selected analytical techniques. This is e.g. ensured by collaboration with the transnational certification body Ecocert, the Danish Veterinary and Food Administration and several other relevant stakeholders. Currently, the primary analytical approach for authentication of organic products is pesticide residue analysis. In AuthenticFood it has been demonstrated that this approach is unable to reveal if organic products are authentic. It is therefore essential that laboratories specialized in food analyses implement and offer analyses according to the novel analytical methods of AuthenticFood. This will be ensured by a wide dissemination of analytical protocols and results via AuthenticFood publications and national workshops.

Relevance

The findings of AuthenticFood are relevant and transferable to all countries that have systems for inspection and certification of organic plant products. This includes countries that produce, export and/or import organic products. In order to ensure a transnational impact of the AuthenticFood findings it is essential that data, protocols and knowledge is shared so that databases of reference values for organic plant products from specific management practices and geographical origins can be established. It should also be noted that several of the developed analytical methods are applicable for geographical authentication of both organic and conventional plant products which currently represents a focus point in the food industry globally.





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New and important research questions

AuthenticFood has shown that significant differences can be found between the chemical composition of organic and conventional plant products. However, a complete understanding of the underlying biology and the consequences of different agricultural management practices on the chemical composition and quality of plant products is still pending. Knowledge regarding interactions between microorganisms, soil and plants in organic and conventional production systems is thus urgently needed.



Find all publications at
[orgprints.org/view/projects/
AuthenticFood.html](https://orgprints.org/view/projects/AuthenticFood.html)



Further information

This project is funded via the ERA-net CORE Organic II by national funds to each partner. CORE Organic II is a collaboration between 21 countries on initiating transnational research projects in the area of organic food and farming. In 2011, CORE Organic II selected AuthenticFood and 10 other projects.

Read more at coreorganic2.org/AuthenticFood.

