

# An organic milk authentication service

A European research consortium, funded by EIT Food and led by a team at the University of Reading (UK), is developing an authentication service for organic milk based on metabolic profiling by NMR



## Technology

Since organic retail milk is priced higher than conventional milk, and milk is regularly consumed by >90% of consumers, there is a risk of wrongly or fraudulently labelled products. Current certification schemes rely on time-consuming and costly practices to validate authenticity but there is no widely-available lab-based organic milk authentication test.

The [research consortium](#) has collected a library of approx. 1,900 farm and retail milk samples from the UK and Finland, which have been analysed by 500 MHz and 850 MHz NMR, respectively.

The team is evolving existing NMR technology to foster the development of an authentication service which will include whole spectral profiling, metabolomics discriminant models, and quantification and/or unique presence of individual metabolites.

The key assets of the technology include:

- Approx. 1,900 milk samples with associated meta data (e.g. management practices for farm samples and label information for retail samples) that can be used as reference samples
- NMR spectral data for samples analysed by the Universities of Reading and Helsinki
- Extraction, data analysis and other SOPs
- Confidential knowledge of the biomarkers and metabolites that have been identified as being indicators for distinguishing organic from non-organic milk
- Method validation data from blinded samples run through the project

## Benefits

- Applicable at all supply chain levels (farm, preproduction, retail) and seasons.
- Respond to growing consumer demand for transparency and authentication of organic food.
- Service will continuously improve by re-calibrating to include new data, and can be calibrated for different countries and farm management conditions
- Knowledge of biomarkers could allow analysis to be adapted from NMR to mass spectrometry, GC and/or HPLC

## Key beneficiaries

- **Analytical services:** Potential demand for service from the thousands of organic farms and retailers across Europe.
- **Dairy/value-added industry and retailers:** Show commitment to transparency in the organic dairy chain. This will improve their credibility, reputation, provenance and ultimately consumer preference and revenue.
- **Authentication authorities/government:** Complementary tool to existing certification strategies (farm audits), to allow for quick screening of large number of farms.
- **Consumers:** Improve transparency, trust and offer protection against fraud or mislabeling.

## On-going developments

Data is being adapted to more cost-effective 400 MHz NMR analysis. The team is currently seeking opportunities with potential partners and licensees.

### Partnering Opportunity

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