

A collage of images related to food and agriculture, including a wine glass, a person holding a bottle, a basket of fruit, and a spiral pattern. The text 'Food authenticity and traceability' is overlaid in blue, and 'NEWSLETTER' is overlaid in green below it.

Food authenticity and traceability

NEWSLETTER

Here is the 13rd edition of the newsletter. The newsletter provides a summary of latest information in the area of food authenticity and traceability and is funded through the *TRACE* project.

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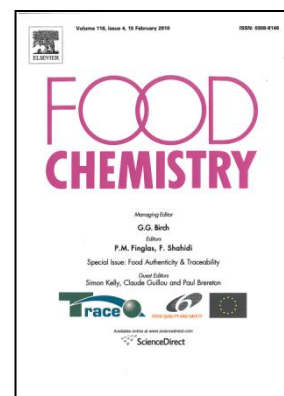
Paul Brereton, FERA, UK, Coordinator

(paul.brereton@fera.gsi.gov.uk)

TRACE has just completed the final year of a five year research programme. The year has seen the completion of all the remaining deliverables within the original time frame of the project. Over 60 deliverables have been produced in a year where the focus has been on assessing and interpreting the huge amount of data generated in the “food mapping” aspect of the project. The project has progressed further than originally anticipated in terms of the specific objective “to correlate geochemical morphology and bioclimatic factors with that of locally grown food”, in that, where correlations have been found, several prototype implementation tools for assessing geographical origin have been produced. These scientific advances and the wealth of data generated, have themselves unearthed further questions and possibilities that should lead to further avenues of research and exploitation that are beyond the scope of the TRACE project. Some of the key outputs in the final year are highlighted through the articles of this newsletter.

The year has also been notable for the volume and variety of technology transfer and dissemination activities:

- Web-based interactive tools
 - ‘Tracing your food’ interactive animation website was launched at the 5th Annual Trace Meeting in Freising (<http://www.trace.eu.org/tracingyourfood.php>)
 - The TraceFood Wiki was maintained and the final TraceFood GTP guidelines were developed (<http://www.trace.eu.org/tracefoodwiki.php>)
 - Public release of molecular biological database (www.trace.eu.org/mbdb) that contains information on methods, sequences and procedures for using molecular biological techniques to authenticate food.
- Publications
 - 23 peer reviewed publications (<http://www.trace.eu.org/library/publications.php>)
 - A special “TRACE” Edition of Food Chemistry entitled ‘Food Traceability and Authenticity’, Food Chemistry Special Edition, Vol 118, Issue 4, 15 February 2010.
 - Two industry-focussed booklets have been produced on fingerprinting and methods for confirming geographical origin respectively (<http://www.trace.eu.org/brochures/index.php>).
 - 3 TRACE e-Newsletters (<http://www.trace.eu.org/archive/eletter.php>)



- Workshops and conferences
 - Two TRACE conferences in Germany and Belgium, TRACE sessions at conferences in Czech Republic and Maryland USA (<http://www.trace.eu.org/meetings/>)
 - Four workshops/training courses on specific aspects of TRACE took place in 2009, i.e. Traceability (Iowa, USA); Isotope Ratio Mass Spectrometry, (Germany); Cost-benefit of traceability, (Norway); Determining Geographical origin, (Czech Republic) and Rapid profiling methods (Czech Republic) (<http://www.trace.eu.org/ws/>)
- Multimedia
 - A multimedia DVD ‘Tracing the origin of food: Information pack’ has been issued.
 - A video mapping process of the beer production chain has been produced (http://www.trace.eu.org/library/trace_video.php).
- Travel grants to support participation of two young researchers at the 5th and 6th TRACE conferences were provided.

In addition TRACE participants have disseminated TRACE results at 18 conferences and meetings in 14 countries.

TRACE has become the focal point for food traceability and authenticity activities and regularly attracts >150 attendees to its conferences. Most of the outputs of TRACE are non-proprietary solutions; as such they have been welcomed by the industry sector. The outputs from the project are already being implemented by the food industry in an attempt to improve the consumer confidence and thereby boost the economy in the agri-food sector. Examples of industry use of TRACE outputs or using TRACE-type technologies include:

- Parmigiano Reggiano PDO cheese consortium (IT)
- Grana Padano PDO cheese consortium (IT)
- Granja Pocitana S.R.L. olive oil (AR)
- Bodega Augusto Pulenta winery (AR)
- Carton Group chicken producer (IE)
- EBLEX (and consortium) beef (UK)
- BPEX implementing isotopic techniques in the pork industry (UK)
- Australian pork industry
- EPCIS (exploitation of TraceCore technology)

More on <http://www.trace.eu.org>



How to verify the authenticity of food?

Correlation of geochemical morphology and bioclimatic factors with that of locally grown food

Paul Brereton, FERA, UK, Coordinator

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The TRACE project has progressed further than originally anticipated in terms of the specific objective “to correlate geochemical morphology and bioclimatic factors with that of locally grown food”, in that, where correlations have been found, several prototype implementation tools for assessing geographical origin have been produced.

Some of the key outputs in the final year were:

- The development of a generic $^{87}\text{Sr}/^{86}\text{Sr}$ prediction model for Europe based on IGME5000 and the Quaternary layer. This output has a wide range of applications in terms of provenance assignment across the agri-food sector. The maps indicate where typically high or low Strontium (Sr) isotope values can be expected and as such can serve as a general screening technique in geographical provenancing of food, especially in combination with other parameters.
- The development of specification prediction models (SPMs) for a variety of parameters/food commodities including chicken, olive oil and cereal as well as an integrated evaluation of these models.
- The development and release of a prototype implementation software tool (TraceTool) for on-line dissemination of the SPMs for mineral water (see Figure 1) and olive oil.
- The development of an integrated database containing data (sampling information, analytical methods, analytical results and quality assurance) essential for further exploitation of ‘Food Mapping’ research.
- Completion of the final demonstration activity. The technical changes in the white fish supply chain completed and recommendations implemented.



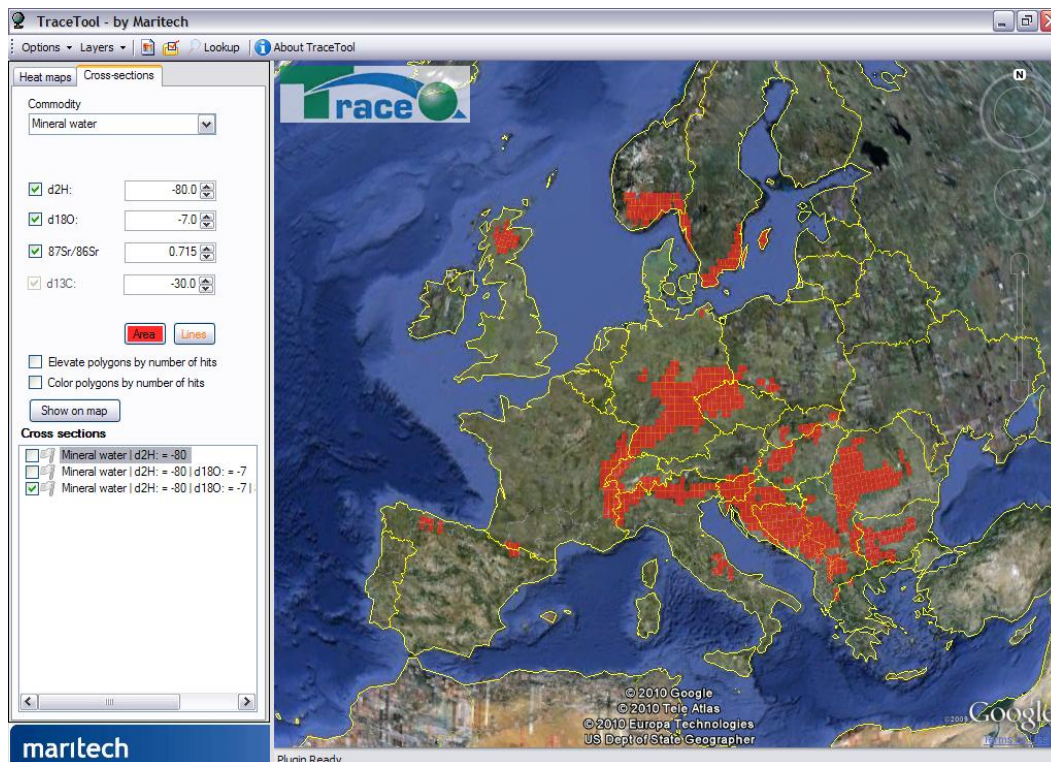
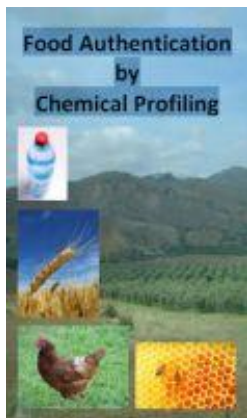


Figure 1: An example of the output from TRACE tool

Food Authentication by Chemical Profiling

Henriette Ueckermann, UEA/University of East Anglia, UK, WP1 partner

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A booklet describing the combined results from Workpackages 1, 15 and 16 was produced with the aim of illustrating the values and benefits to consumers, producers, regulatory bodies, and the public in general.

Workpackages 1, 15 and 16 focussed on the trace element and C, H, O, N, S and Sr isotope composition of soils, natural water and various food commodities in order to identify chemical parameters which would be transferred from production regions to food commodities. Samples were collected from sites representing various climatic and geological characteristics across Europe. Chemical parameters that proved systematically discriminatory for production regions were used to produce prediction models which calculate a combination of ranges of chemical parameters expected for commodities, based on geological and geographical origin. These chemical parameters can

be measured in food commodities of which the origin is questioned and results can then be compared to the values predicted by the models to determine whether the claimed origin is likely or not. A web-based prediction application, which indicates possible production regions given various chemical characteristics, was produced in collaboration with WP4 (TraceTool; see Figure 2).

This booklet attempts to describe the approach and techniques used, as well as the results, interpretation and implications, in a way that readers with a non-scientific background can follow. The booklet can be downloaded from: http://www.trace.eu.org/ft/doc/Consumer_Booklet_Final.pdf

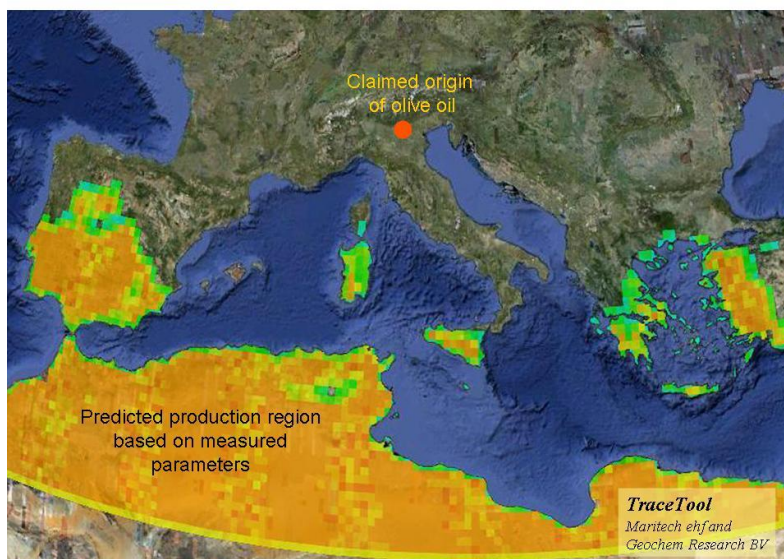


Figure 2: TraceTool prediction maps for the carbon-13 and oxygen-18 composition of olive oil showing the area where a certain combination of isotope values would fall within the predicted ranges of the model. If this combination of isotope values would be observed in a sample claimed to be from e.g. northern Italy it is clear that the predicted area of origin and the claimed area of origin do not overlap, indicating the sample is potentially non-authentic.



Booklet on food analysis by fingerprinting techniques

Luisa Mannina, CNR-IMC/University of Molise, IT, WP2 partner (mannina@unimol.it)

In the framework of the TRACE project, fingerprinting and profiling methods have been developed to characterise a number of foodstuffs- chicken, honey, olive oil and beer. A booklet has been written to describe the application of these TRACE fingerprinting techniques to Food Assurance (see Figure 3). A brief description of the fingerprinting techniques together with the most interesting results for these foodstuffs are reported. The possibilities for their deployment to other authenticity issues in a wide-range of foods are discussed. This booklet is available from the TRACE website in three languages (English, Spanish and Italian) (<http://www.trace.eu.org/brochures/booklet.php>).

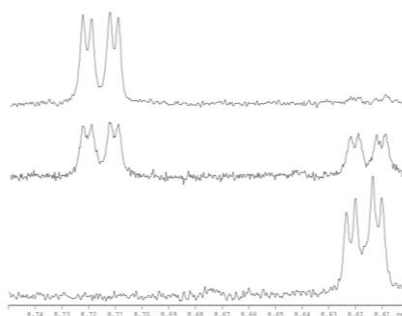


Figure 3: The booklet about food analysis by fingerprint and an example “fingerprint”



How does the food industry trace the foodstuffs?

Fingerprinting methods to authenticate beer

Monika Tomaniova, ICT-Prague, CZ, WP10 partner (Monika.Tomaniova@vscht.cz)



Beer is an example of a processed cereal product that is consumed widely across the EU and the wider world. Brand identity is a key attribute of beers and often arises from longstanding brewing practices associated with a region, town or even religious order. One such example of the latter is the Trappist beer produced in Belgium and The Netherlands. Trappist and non-Trappist beers have been used by the TRACE project to develop original models enabling one to distinguish the origin of beer products, Rochefort.

The video here below gives an overview of the process of the beer production chain and illustrates outcomes of the beer study.

More on [TRACE website](#)



Other TRACE News

AUTHENTICATION AND TRACEABILITY OF AGRICULTURAL AND FOOD PRODUCTS USING VIBRATIONAL SPECTROSCOPY

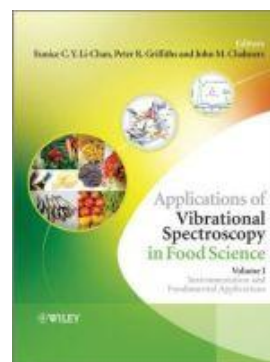
29 October 2010

This chapter of the book "Applications of vibrational spectroscopy in food science", prepared by the TRACE scientists, Vermeulen et al., aims to show the use of vibrational spectroscopy in traceability for authenticating the geographical origin, the variety/species origin and the production process of food and feed products. In this chapter several examples coming from European projects dealing with authenticity, amongst others the TRACE project, are discussed.

Information supplied by Philippe Vermeulen, TRACE web-correspondent (CRA-W)

Source : TRACE

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TRACE: AN EXAMPLE TO TRAIN YOUNG EUROPEAN JOURNALISTS

10 September 2010

The MY SCIENCE ('My science European program for young journalists') project, funded under the EU's Seventh Framework Programme (FP7) and coordinated by the European Academy of Bolzano in Italy (EURAC Research), selected 85 young journalists from all over the European Union and Associated Countries to support training activities in EU-funded research laboratories. With a budget of EUR 252,612, enhancing the relevant role of the scientific dissemination is the main objective of this transnational and collaborative action.

Information supplied by Philippe Vermeulen, TRACE web-correspondent (CRA-W)

Source : CORDIS news

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RECOGNITION OF BEER BRAND BASED ON MULTIVARIATE ANALYSIS OF VOLATILE FINGERPRINT

02 August 2010

This recent article by the TRACE scientists Cajka et al., aims to show the potential of the automated head-space solid-phase microextraction (HS-SPME) coupled to gas chromatography–time-of-flight mass spectrometry (GC–TOFMS), to discriminate the obtained fingerprints (GC profiles) of beer volatiles.

Information supplied by Monika Tomaniova, TRACE web-correspondent (ICT-PRAGUE)

Source : TRACE

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News from other projects

TRACKING BACK FROM PLATE TO NET

26 April 2010

Combating illegal fishing is critical for achieving sustainable management of the seas. But the very vastness of the big blue makes it extremely difficult to outwit fraudsters. Researchers are right now developing new tools to trace a fish's origin and determine whether it was caught legally or not.

Information supplied by Philippe Vermeulen, TRACE webmaster (CRA-W)

Source : Research EU Magazine

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SWEDISH PILOT APPLIES EPCIS STANDARD TO FOOD TRACEABILITY

28 June 2010

eTrace, a project within SafeFoodEra, conducted a traceability pilot in Sweden in last month, to find out if the EPCIS standard is suitable to trace food in a food supply chain. The successful pilot proved various benefits of EPCIS-based systems.

Information supplied by Laura Gray, TRACE Web-correspondent (TraceTracker)

Source : TraceTracker

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News in Europe

ASSURING BRAND INTEGRITY

23 April 2010

Article by Ross Aylott - Aylott Scientific regarding counterfeiting issues in the spirits industry based on his presentation at the 5th TRACE conference in Freising 2009.

Information supplied by Caroline Garrod, Web Correspondent (Fera)

Source : Brewer & Distiller International, April 2010

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News outside Europe

CANADIANS DEVELOP SYSTEM TO DETECT FOOD FRAUD

27 May 2010

Adulteration of food products, either through mislabelling, ingredient substitution or dilution with a less expensive ingredient is a growing concern for Canadian consumers. One Canadian project aims to develop a cost-effective molecular internal tagging system in order to track food products as they move through the supply chain.

Information supplied by Freddy Thomas, TRACE web-correspondent (Eurofins)

Source : CBC News

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Upcoming Events

10 - 11 November 2010
FINAL TRACEBACK CONFERENCE
Milan - Italy
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15 - 19 November 2010
INTERNATIONALE COURSE ON
ADVANCED FOOD ANALYSIS
Wageningen - The Netherlands
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21 - 24 March 2011
FOOD INTEGRITY AND TRACEABILITY
CONFERENCE
Belfast - UK
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18 - 20 April 2011
6TH INTERNATIONAL CIGR
TECHNICAL SYMPOSIUM
Nantes - France
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18 - 20 May 2011
FIRST INTERNATIONAL CONFERENCE ON
ORGANIC FOOD QUALITY AND HEALTH
RESEARCH
Prague - Czech Republic
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01 - 04 November 2011
5TH INTERNATIONAL SYMPOSIUM
ON RECENT ADVANCES IN FOOD
ANALYSIS
Prague - Czech Republic
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This work is funded by the European Commission, under the FP6 Food Quality and Safety Priority, within the framework of the Integrated Project *TRACE* – 006942 – entitled “Tracing Food Commodities in Europe”. This project is carried out by a consortium coordinated by the CSL – Central Science Laboratory (UK) and includes 51 partners. The information reflects the authors views, the European Commission is not liable for any use of the information contained therein.

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