

A collage of various food-related images including grapes, a person holding a glass, a bowl of fruit, and a spiral pattern.

Food authenticity and traceability NEWSLETTER

Here is the 12th 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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In the spotlight

Final Trace Conference



Final TRACE conference in Brussels: How to trace the origin of food?

TRACE organising committee, CRA-W
– FERA - ICT
(trace2009BXL@trace.eu.org)

In the framework of the [TRACE project](#), CRA-W hosted the Final TRACE conference “How to trace the origin of food” on 2-3 December 2009, at the Autoworld in Brussels. The conference was organized in collaboration with FERA and ICT.

The conference was dedicated to the TRACE results and featured the following topics: Consumers’ perception of food traceability in Europe, TRACE and international impact, traceability systems, analytical techniques to authenticate the origin of food, traceability and the future. Poster sessions, interactive demonstration activities and “a market place” showcasing projects/companies exploiting TRACE outputs took also place.

Over 165 people attended the conference, coming from 29 countries through the world. The 36 lectures and the 32 posters presented during this event can be viewed on the TRACE website on <http://www.trace.eu.org/je/belgium>.

The main TRACE outputs are highlighted through the articles of this newsletter.

How to trace the origin of food?

**Autoworld Brussels
Belgium
2 - 3 December 2009**

The poster features a central image of a milk splash with a spoon. Below the main title, there are three small square images: a tractor in a field, a plate of food, and a person in a grocery store. At the bottom, there are three logos: the European Union flag, the Food Quality and Safety logo, and the CRA-W Ghent logo.



TRACE technology transfer activities: main outputs (WP10)

Monika Tomaniova, ICT Prague, Czech Republic, WP10 leader, (Monika.Tomaniova@vscht.cz)

With the help of all the consortium

The technology transfer activities of TRACE project were aimed at providing and overseeing knowledge transfer through short-term training activities, workshops, conferences and other activities with the aim to provide a comprehensive training programme for scientists and industry and disseminate TRACE outputs to all interested stakeholders.

The following activities were organised / produced:

- i) 23 one-to one **short term training activities** and training courses to train interested scientists / SMEs / other stakeholders in analytical methods for authentication of food products, traceability systems and consumer perceptions and behaviour (for more detailed information about training courses see <http://www.trace.eu.org/events/ts/>),
- ii) 8 **workshops** with the aim to disseminate knowledge developed within specific project activities, both in the field of food authentication, traceability systems and consumer perceptions and behavior (for more detailed information about workshops see <http://www.trace.eu.org/ws/>),
- iii) 6 **conferences** with the aim to provide to worldwide public information about project outcomes (for more detailed information about conferences, see <http://www.trace.eu.org/meetings/>),
- iv) **A booklet on “Food Analysis by Fingerprinting Techniques”** for food industry and other interested stakeholders where the information how it is possible authenticate food product is provided in format comprehensible for non-scientific public,
- v) **A special issue of Food Chemistry on Food Authenticity and Traceability** (Volume 118, Issue 4, pp. 887-998) to inform scientific public about specific project outcomes,
- vi) **An interactive animation website “Tracing your food”** (<http://www.foodtraceability.eu/>) with the aim to provide to all interested stakeholders (scientists, SMEs, other people) information about traceability issues in understandable format,
- vii) **A video** about the overview of the demonstration activity on mineral water (http://www.trace.eu.org/library/trace_video.php) and a video mapping the process of the beer production chain and illustrating outcomes of the beer study (<http://www.trace.eu.org/je/belgium/lectures/L4-11.php>) to demonstrate to worldwide public how traceability systems can be implemented into the practice and how it is possible authenticate food products, respectively,
- viii) **A multimedia DVD “Tracing the origin of food”** to provide to all interested stakeholders an information pack about all the main outcomes of TRACE project - i.e. presentations from the TRACE project conferences, workshops and other events organised in cooperation with TRACE, TRACE publications, brochures, newsletters, videos, booklet, interactive websites, database.

For more information see the lecture of Monika Tomaniova (ICT) at the [Final TRACE conference](#)

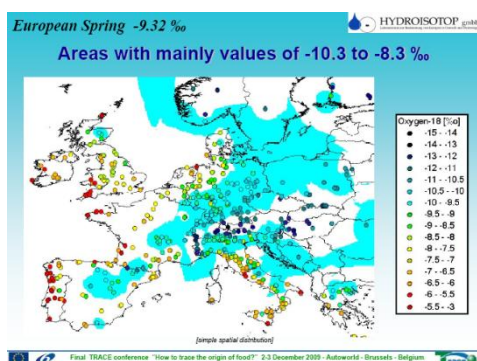


How to verify the authenticity of food?

Links between the stable isotope (H,C, N, O, S) composition of water, soil and agricultural products to evaluate the geographical provenance of food commodities (WP1)

Dr. Andreas Rossman, Isolab GmbH, Germany, WP1 leader, (isolab_GmbH@t-online.de)

With the help of [WPI partners](#): AIT (AT), EC-DG-JRC (BE), EFS (FR), FERA (UK), HYDROISOTOP (DE), IFR (UK), IQSTAP (CN), FEM-IASMA (IT), ISOLAB (DE), LGL (DE), NUID (IE), TEAGASC (IE).



The use of stable isotope analysis of H and O in water and C and N in food components for food authenticity control has been in common practice since before TRACE started. However, the analysis of H and O isotopes in organic compounds and S isotopes in sulphates and organics, has evolved during the TRACE project. TRACE WP1 has calibrated Inter-laboratory Comparison Materials and developed and validated methods for sample preparation and analysis of HCO isotopes in olive oil, HCN and S isotopes in proteins, CNO and S isotopes in cereals, and S isotopes in water sulphates and soil extracts. Data for the relevant isotopes in mineral and surface waters, soil extracts and food commodities (honey, cereals, olive oils, lamb, beef, chicken) from 21 regions across Europe have been measured and submitted to the TRACE data bank. The results have been evaluated using statistical methods such as Linear Discriminant Analysis and Principal Component Analysis and published in international peer reviewed journals. Some publications combining results from WP1 with those from other TRACE WP's (WP15, WP16) have been produced as well. The methods developed were applied to food commodities from China (chicken) and Argentina (wine, olive oil, cereals, beef), too, and results from these International studies will be used for comparison with European products and additional publications. The methods developed and tested are now being applied in national control laboratories and commercial laboratories for improved control of food geographical origin and authenticity. On the basis of the data supplied, WP16 has developed and is still engaged in further development of prediction models that are now coming on-line as Google Earth applications through the work of Dr Grishja van der Veer and Maritech for stable isotope data in water and food commodities. WP1 members have also been actively involved in disseminating TRACE technology and scientific outcomes as well as training activities in stable isotope analysis.

More information in lecture of Simon Kelly (IFR) at the [5th TRACE Conference](#) and in the lecture of Gesine Lorenz (Hydroisotop) at the [Final TRACE conference](#)



Trace elements and Sr-Isotopes analyses to evaluate the geographical origin of food products (WP15)

Dr. Jurian Hoogewerff, UEA, United Kingdom, WP15 leader, (J.Hoogewerff@uea.ac.uk)

With the help of [WP15 partners](#): AIT (AT), BSPG (DE), EC-DG-JRC (BE), FERA (UK), FEM-IASMA (IT), INGEIS (AR), UEA (UK), UNC (AR), UNLP (AR), WPA (AT)

As plants and animals are integral parts of their natural or managed local ecosystem they will contain bio-geo-chemical fingerprints that allow discrimination between those ecosystems by analytical means. The challenge for the scientific community is to investigate which markers deliver the most cost-effective and relevant geographical discrimination for each class of products.



In the last two decades, small-scale proof of concept research projects have demonstrated that foods from different geographical regions have varying Natural Isotope-ratio and Trace Element profiles (NITE). In the framework of TRACE project, the profiling investigation focused on 650 mineral waters from the whole of Europe and a detailed comparison of wheat, honey, olive oil and lamb from 21 test regions with the regional soil and surface water composition. In addition analysis of chicken and beef samples from different continents was completed.

From the first results of the TRACE project, it is emerging that NITE profiling also works on large scales but that individualisation of production regions is probably not possible by NITE alone as indistinguishable climatological and geochemical conditions can occur at different, often far away, geographical locations. Thus NITE profiles can be very useful in answering specific compliance questions like “can this wheat come from a specific region” but not yet at finding the origin of an unknown batch. Although it can indicate most likely (if known) areas and often even more valuably, exclude unlikely areas.

The developments in and around the TRACE project have provided new insights that now can be applied in other forensic provenancing issues. One of the “insights” is that modelling or predicting soil composition from lithology alone is extremely challenging and that probably the best way forward is to produce empirical geochemical soil maps, especially Isoscapes (isotope maps) for relevant areas of food production, water production, protected plant and animal species habitats, and validate those maps with Isoscapes of required target foods and tissues.

More information in the lecture of Jurian Hoogewerff (UEA) at the [Final TRACE conference](#)



Geo-Specifications Modelling (WP16)

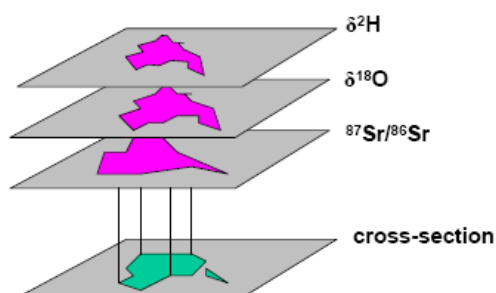
Dr. Grishja Van Der Veer, Geochem, The Netherlands, WP16 leader, (gvanderveer@geochem.nl)

With the help of [WP16 partners](#): AIT (AT), AUA (GR), BGR (DE), EFS (FR), EC-DG-JRC (BE), GEOCHEM (NL), FEM-IASMA (IT), HYDROISOTOP (DE), KPAL (UK), MARITECH (IS), UEA (UK), UUFDG (NL) and WPA (AT)

The isotopic and trace element composition of food often contains specific information about the local climate and the geological conditions. Using this knowledge, isotope and trace element specifications can be developed that are characteristic for food commodities from a certain area. Food specification maps provide such isotopic specifications of food on a continental scale, allowing to verify the origin of food in a cost-effective way. As different regions can have overlapping climatic conditions and/or geologies – resulting in similar specifications –, the strength of the food map approach is based on using of a *combination* of maps that each provide additional detail and allow to further confine the area where certain isotopic and trace element specifications occur.

Food specification maps

Combined specification areas for $\delta^2\text{H}$, $\delta^{18}\text{O}$ and $^{87}\text{Sr}/^{86}\text{Sr}$



The combined specification area (in green) applies to a cross-section which is smaller than the individual specification areas

food by comparing the actual isotopic composition of an unknown sample with the predicted specifications from its acclaimed production region.

To facilitate working with a combination of different food specification maps, the TraceTool has been developed. The TraceTool is a web-embedded application that allows the user both to retrieve specifications for a certain location as well as to view the cross-section area where a combination of certain specifications occurs. It is an n-tier application where the presentation layer calls a web service which gets the data from a database and formats it into a structure known as Keyhole Markup Language (KML) to display the results onto a virtual globe.

For more information, and to download TraceTool, see the lecture of Grishja van der Veer (Geochem) and Stefan Höskuldsson (Maritech) at the [Final TRACE conference](#)



Fingerprinting and Profiling Methods (WP2)

Dr. Gerry Downey, TEAGASC, Ireland, WP2 leader, (Gerard.Downey@teagasc.ie)

With the help of [WP2 partners](#): CNR-IMC (IT), CRA-W (BE), EC-DG-JRC (IT), FERA (UK), ICT-Prague (CZ), IFR (UK), TEAGASC (IE)

The behaviour of European consumers has been undergoing gradual changes. People require not only high quality products but also certification and reassurance of product origin and production methods. In order to preserve quality food products coming from specific geographical areas and to protect consumers against imitations and false information, the European Commission defined, through different EC Regulations, several labels, for example the Protected Designation of Origin (PDO). These quality labels play a role in the behaviour of consumers who buy these kinds of products because of their reputation.

Scientific studies that objectively identify a product are mostly focussed on the development of methods to authenticate these PDOs or other logos but also to monitor the possible changes regarding the food properties during storage, distribution and up to the point of retail sale. The development of new analytical techniques, which can derive a characteristic fingerprint of a certain product, is an important key for the authentication and to preserve quality food products. This research project aimed to develop methods to detect such a fraud in extra virgin olive oil, honey, chicken and Trappist beers by mathematical interrogation and manipulation of spectroscopic fingerprint techniques.



A Specific Issue

Can we develop a fingerprint method to confirm that an olive oil labelled as Ligurian actually comes from Liguria?



In a first study, a range of spectroscopic (NIR, FTIR, Raman & NMR) and separation methods (DIMS & SPME-GC-MS) have been applied to the problem of confirming that olive oil labelled as Ligurian (PDO) conforms to a relevant specification. Samples (n=668) from Italy, Spain, France, Greece, Cyprus and Turkey collected over two harvests were studied in this work. Correct classification rates (Ligurian vs non-Ligurian) of up to 95% were obtained.

More information in lecture of Gerry Downey (TEAGASC) at the [3rd TRACE Conference](#)



In a second study, spectroscopic fingerprint techniques (NMR, NIR, FTIR, Raman, SPME-GC*GC-TOFMS) have been deployed to develop models for honeys from the specific PDO region of Corsica over a two-

harvest period. These models are designed to facilitate confirmation of claims that a honey meets the normal criteria of this PDO. The results show that out of 100 samples labeled as Corsican, 89 are well classified as being from Corsican origin. During 2007, a set of honey samples were analysed blind by these fingerprint models and stated as meeting or not meeting the relevant criteria.

More information in lecture of Vincent Baeten (CRA-W) at the [4th TRACE conference](#)



The third study was dedicated to chicken. A total of 383 chicken breast meat samples obtained directly from China, Europe, South America and Thailand were analysed by NMR spectroscopy in order to discriminate chicken by geographical origin. Results generated by the best mathematical model showed that out of 100 samples labelled as originating in China, 99 were identified as Chinese by the model. The difference between samples of different origin is due to their composition.

More information in lecture of Gerry Downey (TEAGASC) at the [workshop in China](#)

Beer is an economically-important product of cereal fermentation. In Belgium, beers from Trappist monasteries enjoy particular status on account of their perceived high and consistent quality. To protect this status and as an aid to marketing, beers brewed in monastic sites under the control of Trappist monks are entitled to display a Trappist logo on their label. A number of breweries which were once under monastic control produce beers in the Trappist style but are not entitled to use the label logo.



In this fourth study, a number of spectroscopic fingerprint techniques have been deployed to develop models which may confirm the identity of Trappist beers. A collection (n=124) of Trappist and non-Trappist beers (mainly sourced in Belgium) have been collected from several production batches and analysed contemporaneously by these methods. Models have been developed to discriminate between Trappist and non-Trappist beers using this initial sample set. A second set of beers (n=124) was collected from different batches of beers on a second occasion to (a) evaluate the accuracy of previously-developed discriminant models and (b) to determine the stability of the models when applied to beers which have been stored for an extended time period. Results indicate the potential of a number of techniques to achieve the required levels of accuracy effectively.



More information in lecture of Gerry Downey (TEAGASC) at the [5th TRACE Conference](#) and in the lecture of Juan Antonio Fernandez Pierna (CRA-W) at the [Final TRACE conference](#)

A brief description of the fingerprinting techniques together with the most interesting results for these foodstuffs are reported in a booklet. The possibilities for their deployment to other authenticity issues in a wide-range of foods are discussed. This booklet is intended to serve as a guide and help for companies, scientific professionals and consumers.

Available on-line on <http://trace.eu.org/brochures/index.php>



The species origin methods and the TRACE database on molecular markers (WP3)

Dr. Hermann Broll, BfR, Germany, WP3 leader, (hermann.broll@bfr.bund.de)

With the help of [WP3 partners](#): BATS (CH), BfR (DE), BIOLYTIX (CH), CRA-W (BE), EC-DG-JRC (BE), EFS (FR), FERA (UK), INRA (FR), IZ-USCS (IT), QIAGEN (DE), RIKILT (NL), UUFDG (NL)

One goal of this workpackage was the characterisation of food products on the basis of DNA or protein detection methods. DNA methods are increasingly used due to their higher degree of specificity, and their suitability for the analysis of highly processed foodstuffs.

Along this line new DNA based methods have been developed in particular for highthrough-put application such as the padlock-ligation assay. Due to the intrinsic specification numerous targets can be identified in a single reaction (multi-plexing).

Furthermore the characterization of meat products by breed differentiation has been performed successfully. Genotyping based on microsatellites resulted in a new method to differentiate between the meat allowed and not allowed for the preparation of a PGI product called 'Vitellone dell Appennino Centrale'. The determination of the origin of honey products using the pollen composition was another challenge within Work Package 3. More than 16 individual methods for plant species have been developed using the real time polymerase chain reaction (PCR). It was demonstrated that a certain set of pollen species are present in Corsican honey while other species are not present.

Beside species identification, the source of production has been analysed further. Wheat was cultivated under either conventional or organic farming conditions. It has been postulated that the source of production does have an influence on the gene expression and consequently on the mRNA profile. Standardized protocols have been developed in order to analyze the whole genome for differential regulated genes. A few candidate genes have been used in reverse transcriptase real time PCR assays to verify their suitability for this purpose.

All methods developed were validated at least in-house based on a common set of criteria established within the TRACE Work package 3 consortium.

The screenshot displays the TRACE Molecular Biology Database interface. At the top, it says 'Tracing the origin of food' and 'TRACE - Molecular Biology Database'. The main content area shows search results for 'Apis Mellifera Ligustica'. Key sections include:

- Food Product:** Honey, with a generic image and product type 'SUGAR AND HONEY (M462)'. A 'DNA-sequence' label points to the 'DNA-Sequence' field.
- Taxonomy:** Genus: Apis, Species: mellifera.
- Sequence:** NCB-Accession: F06178 REGION: complement(1-335). A 'SOP' label points to the 'PCR' section.
- PCR:** Real-Time PCR for the detection of Apis mellifera. Includes parameters like Amp. Length (103), Amp. Position (295-408), and System (UNG activity: 2 min / 59 °C Active).
- Primers:** A table listing primer names (e.g., AmelR_RT-F, AmelR_RT-R), their sequences, and lengths.

To disseminate the developed detection methods to identify origin of meat, honey and cereals, TRACE partners 41 ([Agency BATS](http://www.bats.de)) and 4 ([Bundesinstitut für Risikobewertung BfR](http://www.bfr.bund.de)) developed an online database on molecular markers. In the last 3 years of the project, the scientific data delivered by the participants of WP3 was imported into the database, but was only accessible for members of the TRACE project. At the final TRACE conference, all confidential information, was released to the public, accessible on the TRACE website under: www.trace.eu.org/mbdb

More information in the lectures of Hermann Broll (BfR) and Jakob Lindenmeyer (BATS) at the [Final TRACE conference](#)



The role of chemometrics in provenancing food (WP6)

*Dr. Bernard Vandeginste, VICIM, The Netherlands, WP6 leader,
(b.vandeginste.vicim@science.ru.nl)*

With the help of [WP6 partners](#): NIC (SI), RU (NL), UNIGE (IT), URV (SP), USI (PL), VICIM (NL), VUB (BE)

Chemometrics approach in Food Traceability studies



The main task of WP6 in TRACE was to investigate and to develop chemometric tools for the classification and verification of the origin of food products.

Pattern recognition models differentiate food products of different origins on condition that a good statistical sample of non-authentic products is available and therefore that the origin or types of non-authentic products are known. Under these conditions, adequate differentiation between the authentic and the main non-authentic classes is possible.

Verification models are applied when no good statistical sample of non-authentic samples is available, e.g. because samples of unexpected origin may turn up. To differentiate an authentic food product from a non-authentic product, it is not possible to develop discrimination rules. Instead, a statistical model is made of the authentic samples and (multivariate) outlier tests are applied to detect non-authentic samples.

Often complications are encountered because data are incomplete or data are corrupted (outliers). These complications were also investigated by WP6.

Pattern recognition and verification models are not easy to apply nor are they easily interpretable by the non-chemometrician. Therefore, a second task of WP6 was to translate pattern recognition and verification models into a set of specifications expressed in the original variables.

On the basis of these specifications, a decision is made about the origin of the food product being evaluated. An important aspect here is the probability of making of a wrong decision. A Bayesian approach is proposed.

More information is in the lecture of Bernard Vandeginste (VICIM) at the [Final TRACE conference](#) where the approach followed by WP6 was presented and illustrated with several examples from the main WP6 deliverables: a chemometrics toolbox and a Guideline on formulating specifications from chemometric models.



What information is available for the consumer?

Consumers' perception of food traceability in Europe, main results from TRACE project (WP7)

Dr. George Chrysochoidis, AUA, Greece, WP7 leader, (gc@agribusiness.aua.gr)

With the help of [WP7 partners](#): AUA(GR), ENITAC (FR), HRH (GR), UPARMA (IT), UPM (SP) WUR (NL)

TRACE conducted work regarding consumer behaviour aspects towards tracing of food commodities in Europe. We attempted to answer the following 3 main questions:

- How consumers define “ability-to-trace” food products and food production systems.
- What is the nature, the context and extent of consumer perceptions, wants, needs and expectations regarding “ability-to-trace” food origin and production process, as well as consumers' values, benefits and features associated with such ability.
- What is the nature, context and extent of *utility* consumers' derive from “ability-to-trace”, attitudes towards, intention to purchase and willingness to pay for, traceable foods.



A detailed literature review was conducted regarding consumer perception and acceptability of food traceability covering the period 1995–2005. Twenty four focus groups in 12 countries were conducted eliciting consumers' expectations followed by laddering interviews in 4 countries. Last but not least, a 12-country survey modeling consumer behaviour regarding intention of purchase and a 6-country discrete choice experiment regarding utility consumers derive from “ability-to-trace” and willingness-to-pay were completed.

More information is in lecture of George Giraud (ENITAC) at the [Final TRACE Conference](#)



The consumer representative in the TRACE project (WP8)

Eleni Alevritou, EKPIZO, Greece, WP8 leader, (eleni.alevritou@ekpizo.gr)

The role of the consumer representative in the TRACE project was to operate as a communication link between TRACE scientists and consumer associations to share the concerns and thoughts of each community. Also, to ensure that consumer interests were taken into account. In order to do this, regular updates to, and consultation with, consumer organizations took place over the five years and their input was transferred to TRACE Scientific Committee. In parallel, several dissemination activities addressed to other stakeholders, food scientists, national authorities, academics and journalists etc... were undertaken.

With regards to consumer interests, efforts were made in order for individual consumers to yield direct benefits in terms of being able to verify by themselves the origin of foods over their purchases. Whilst this cannot be achieved by the project itself, it has provided industry with the tools necessary for them to achieve this ultimate goal.

In summary, consumer representative, during the 5 years of the project:

- made [22 presentations](#) of TRACE project at national-international conferences, newspapers, magazines;
- wrote and disseminated a brochure for consumers introducing the [project](#);
- wrote a leaflet simplifying and summarizing the main project results entitled '*How sure can we be for the origin of our foods?*';
- compiled and disseminated a report on 'Consumer associations' opinion on the desirable kind-amount of food traceability information accessible to the individual consumer;
- wrote a report on TRACE limitations and efforts made to produce direct benefits for individual consumer;
- informed and discussed with national food industry, authorities and academics about TRACE project
- introduced the TRACE project to 200 different consumer associations based in 100 different

countries worldwide and updated them with project progress.

- tried to bridge the communication gap between sophisticated scientific advancements and society

More information in the [brochure on TRACE website](#)



Other *TRACE* News

TRACE project workshop on “Determining the geographical origin of food - Trace elements and isotopic patterns in food verification”

Organising committee, Institute of Chemical Technology (ICT-Prague)

Jana Hajslova – Monika Tomaniova



The globalisation of food markets and the relative ease with which food commodities are transported through and between countries and continents, means that consumers are increasingly concerned about the origin of the foods they eat. A growing body of research articles have been published in the last five years detailing the use of natural abundance isotope variation and elemental concentrations as geographic ‘tracers’ to determine the provenance of food. These investigations exploit the systematic global variations of stable hydrogen, carbon, nitrogen, oxygen and sulphur isotope ratios in combination with elemental concentrations, including heavy isotope variations (e.g. strontium-87) and other biogeochemical indicators. This workshop presented developments from the EU FP6 TRACE project in the application of multi-isotopic and multi-element methods in the emerging field of “Food Forensics”. It was held on 3rd November 2009 in Prague as satellite event of the RAFA Conference.



More information is available on [TRACE website](#)



TRACE applications for the food and beverage industry
TRACE project workshop on
“New techniques for food assurance and traceability”

Organising committee, Food and Environment Research Agency (FERA-York)
Helen Grundy – Paul Brereton



Key decision makers from the food and beverage industries attended a TRACE workshop to learn more about how the latest scientific innovations can give their products a leading edge.

Areas covered:

- Honey, lamb, chicken, wheat – tracing the geographic origin
- Beer – authentication of Trappist beers
- Gelatine – determining the species of origin
- Beef – verification of storage conditions
- Oils and fats – profiling techniques

This workshop, New Techniques for Food Assurance and Traceability, was aimed specifically at introducing new analytical techniques and services in food traceability to leading figures of the food and beverage industries.

This one day event was organised and held at the Food and Environment Research Agency (Fera) in York, UK on 17th December 2009. TRACE partners presented their latest analytical capabilities in food assurance to an audience composed of representatives working in quality assurance, supply chain and branding roles. Speakers were members of TRACE Work Packages 1, 2, 3, 5, 10 and 12.

The presentations brought about many interesting questions from the industrial delegates and conversations continued over lunch. Forty delegates attended the workshop. Further information and copies of the presentations can be found at http://www.trace.eu.org/ws/ws_york.php.



News from other projects

Workshop on “Organic food authentication: challenge or utopia?”

30 November – 1 December 2009



Organic agriculture is developing rapidly and its share of agricultural land and farms continues to grow in many countries. Policy makers have approved support for the development of organic farming as a sustainable agricultural system. In the European Union, such support includes the European Union’s rural development programs, the recently revised EU regulation on organic farming and the European Action Plan on Organic Food and Farming. The rapid development of the organic sector and the ever-increasing demand for organic products brings new challenges for the international organic food certification and guarantee systems. Organic produce remains amongst the most difficult to monitor and control. Indeed, currently all scientists can do is test for what should not be there (e.g. chemical pesticide residues).



In this context, the development of a strategy to authenticate organic food products is highly desirable in support to the certification and inspection systems. By bringing together the main groups working in the field, this workshop presented a balanced overview of the state-of-the-art research in this topic. Participants had the opportunity to brainstorm and identify the best approaches for meeting the challenges of organic food authentication. This workshop was held on 30th November and 1st December in Geel in Belgium.

More information is available on [JRC website](#)

Multi-year study on the possibility to analytically detect differences between organic and conventional agricultural products

Fernando Cordeiro, Lubomir Daško, Olivier De Rudder, Benny Geypens, Joseph Haddad, Christophe Quétel and Alain Maquet

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Since 2003, the EU's Common Agricultural Policy (CAP) is demand driven and as consumers and traders have many demands on the value and quality of the products they buy, apart from price, meeting these demands is the quality challenge faced by farmers. The Commission has recently committed to support the European farmers' efforts to win the quality challenge and released a Green Paper asking open questions on the different issues related to food quality (European Commission, 2008). At the close of the consultation, an important issue was the improvement of control systems of the organic products and their auditing in order to maintain high confidence in such food products (European Commission, 2009).

With the growing interest among consumers in organic foods, and as instructed via the European Action Plan for Organic Food and Farming (Action 14), the JRC-IRMM and collaborators have designed a research project on finding ways to enable the discrimination between organically vs. conventionally grown food products. A variety of methods including the analysis of total nitrogen, total polyphenols, phenolic acids, antioxidants and trace element contents, and stable isotope signatures was investigated. Based on their importance in the market, carrot, wheat and potato have been selected as model crops for investigation. Field experiments were run from 2004 to 2007 selecting a farm comparison approach with a Belgian organic farmers association and certified farmers. The farmers had to fill in a field book but followed their own crop husbandry. One variety per crop was sown on closed organic and conventional fields. In 2004 and 2005, one environment per crop was selected in the Walloon Region of Belgium while in 2006 and 2007 the number of environments has been increased up to three.

No consistent significant difference between organic and conventional agricultural products was observed for any marker tested partly due to the existence of a large diversity in the crop husbandry. Nonetheless, several trends were observed as i) a higher content of total polyphenols in organically grown carrots than conventional ones, ii) a lower total nitrogen content in organically grown wheat, iii) higher $^{15}\text{N} / ^{14}\text{N}$ ratios in the organically grown potato, iv) higher contents of P, Cu, Zn and Se in organically grown potato and wheat. In addition, by applying multivariate statistical analyses it was possible to predict the method of production of carrots with a minimum 86% success rate using secondary metabolites and antioxidant activities. Our results show that it would be difficult (impossible?) to identify a universal analytical method and/or marker to authenticate any organic food product but multivariate statistics seems quite promising to achieve this objective. These results show clearly the importance to perform such studies over several years, in various environments and the need to confirm them using several varieties.

References

European Commission (2008). [Green Paper on agricultural product quality: product standards, farming requirements and quality schemes](#). COM(2008) 641 final (p. 22). Brussels, Belgium: European Commission.
European Commission (2009). [Conclusions from the consultation on agricultural product quality](#). VC D(2009) (p. 20). Brussels, Belgium: European Commission.

News in Europe

NEW STRATEGIES OF TRACEABILITY FOR DETERMINING THE GEOGRAPHICAL ORIGIN OF FOODSTUFFS

14 December 2009

The determination of geographical origin is a demand of the traceability system of import-export foodstuff. One hypothesis of tracing the source of a product is by analyzing in a global way the microbial communities of the food and links statistically this analysis to the geographical origin of the food. The creation of a biological Bar Code by PCR-DGGE is the way explored by CIRAD.

Information supplied by Aly Farag El Sheikha, TRACE web correspondent (CIRAD)

Source : CIRAD

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NEW FOOD CHAIN RULES TO ASSIST IN 'FARM TO FORK' SAFETY

09 December 2009

Slaughterhouse operators and livestock keepers will soon have to ensure that appropriate Food Chain Information (FCI) is provided for sheep, goats and cattle which are sent to slaughter. The information is being supplied by the British Food Standards Agency

Information supplied by Caroline Garrod, Web Correspondent (Fera)

Source : Food Standards Agency

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News outside Europe

FDA CALLS MEETING TO IMPROVE FOOD TRACEABILITY SYSTEMS

12 November 2009

Changes in industry practices and customer preferences as well as the increase in food shipped into the US from overseas have also heightened the need to upgrade both traceback investigations and traceforward operations. Federal agencies in the United States need to increase the speed and accuracy of traceability systems to combat outbreaks of food-borne illnesses.

Information supplied by Simon Kelly, TRACE web-correspondent (IFR)

Source : FoodQualityNews

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TRACKING FOOD WITH ISOTOPES

26 October 2009

Australia and New Zealand, two exporting nations that trade on their “clean, green” image, have been targeted by traders using fake “country of origin” labelling to sell foreign produce at a premium. But if criminals can fiddle with labelling, they can’t tamper with the isotopic and trace elements of the food itself, which expresses where it was grown and how.

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

Source : FARM-ONLINE

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Upcoming Events

21 - 22 April 2010

EUROFINS INTERNATIONAL SEMINAR FOOD SAFETY SOLUTIONS

Paris - France

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02 - 04 June 2010

4TH SEMINAR OF EUROPEAN CUSTOMS CHEMISTS

Helsinki - Finland

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17 - 22 August 2010

SUSTAINABLE FOOD CHAIN WORLD SUMMIT

Budapest - Hungary

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25 - 29 October 2010

INTERNATIONALE COURSE ON ADVANCED FOOD ANALYSIS

Wageningen - The Netherlands

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TRACE FP6 project : www.trace.eu.org

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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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