FOODINTEGRITY
Ensuring the Integrity of the European food chain

613688: Collaborative Project

Seventh Framework Programme
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Table of Contents

1. Description of Deliverable .................................................................2

2. Achievement of the Deliverable .........................................................2

   Issue 1 December 2014 .................................................................2

   Issue 2 June 2015 .................................................................2

   Issue 3 December 2015 .................................................................2

   Issue 4 December 2016 .................................................................2

   Issue 5 July 2017 .................................................................3

   Issue 6 November 2017 .................................................................3

   Issue 7 November 2018 .................................................................3

   Issue 8 December 2018 .................................................................3

Annexes

   1. Annex 1 - Newsletter01

   2. Annex 2 - Newsletter02

   3. Annex 3 - Newsletter03

   4. Annex 4 - Newsletter04

   5. Annex 5 - Newsletter05

   6. Annex 6 - Newsletter06

   7. Annex 7 - Newsletter07

   8. Annex 8 - Newsletter08
Deliverable 12.4 Compendium of 5 E-Newletters

1. Description of Deliverable

Compendium of 5 E-Newsletters: Food Integrity e-Newsletter with the information about project activities, announcement of upcoming events and trainings and other interesting information related to the project activities will be produced and disseminated annually to the stakeholders’ database and via the project website. The content, production and dissemination of the e-Newsletter will be undertaken by the project partners [month 60]

2. Achievement of the Deliverable

This deliverable has successfully gone beyond its agreed target by producing 8 Newsletters over the life of the project.

**Issue 1 December 2014** (annex:1) Paul Brereton, Fera Science Ltd, York

- Overview of the FoodIntegrity Project: 1st consortium meeting in York:
- Information on FoodIntegirty-Network.

**Issue 2 June 2015** (annex:2) Jana Hajslova and Monika Tomaniova, University of Chemistry and Technology, Prague, Czech Republic

- 2nd FoodIntegrity Conference, Bilbao: The first results from the project:
- Announcement on the procurement exercise on how to apply for €3m research funds in the project.

**Issue 3 December 2015** (annex:3) Michele Suman, Barilla Advanced Laboratory Research, Parma

- Project highlights: Project results: Procurement update: Dissemination activities.

**Issue 4 December 2016** (annex:4) Paul Brereton, Fera Science Ltd, York

- 8 New Research project commissioned: 3rd Annual FoodIntegrity Conference Prague: The Early warning System.
Issue 5 July 2017 (annex:5) Gerald A. Herrmann, Organic Services, Germany

- 4th FoodIntegrity Conference Parma: • Project results: • Dissemination: • Training activities: • How to get involved.

Issue 6 November 2017 (annex:6) Ian Goodall – Scotch Whisky Research Institute, Edinburgh

- Perspective of Industry / DG Health and Food Safety and FAO on FoodIntegrity:
- Related projects: • FI Priorities – Rapid Detection Methods.

Issue 7 November 2018 (annex:7) Paul Brereton - Queen’s University Belfast

- FoodIntegrity around the world: • Training outcomes: • Advisory Board Gallery

Issue 8 December 2018 (annex:8) Paul Brereton - Queen’s University Belfast

- 5th FoodIntegrity Conference, Nantes: • FI Handbook.

All newsletters have been distributed via email to >3000 (cumulative total) stakeholders/engagers/partners. The latest list of recipients was 552, the number increased year on year. Hardcopies were also produced (approx 2500) and distributed at FoodIntegrity Conference and Events.
Welcome to the first FOODINTEGRITY newsletter

Welcome to the first edition of the FoodIntegrity Newsletter. The aim is to provide you with a brief update on some of the progress on this multifaceted project and let you know how you can get involved. I hope you find the newsletter useful. Please contact us (www.Foodintegrity.eu) with any suggestions for improvement.

Paul Brereton, project co-ordinator, Food and Environment Research (York, UK)

The first Consortium meeting of FoodIntegrity

The first meeting of the FoodIntegrity consortium was held at the Food and Environment Research Agency on 25th-26th February 2014.

More than 200 delegates from 28 countries registered for the event.

The week included the following events:

- Formal launch with high level overviews by stakeholders on the impact of food fraud and the actions they are taking to counter it.
- 1st meeting of the FoodIntegrity consortium,
- Thursday 27th - a Defra-sponsored one-day conference ‘Food Fraud - the Analytical Tools’
- Friday 28th - half-day technical workshop on determining the geographical origin of food.

For more information and presentations visit: https://secure.fera.defra.gov.uk/foodintegrity/index.cfm?sectionid=3
Food Integrity (FI) Network was launched in December 2014. The network is a platform for stakeholders and experts to exchange knowledge and expertise in food authenticity, safety and quality; and to rapidly share information and intelligence about suspected and actual incidents to protect consumers and food products from damaging effects of food misdescription. The overall objectives of the FI Network is to bring together producers, distributors, processors, retailers, regulators, researchers enforcers and consumers to assure the integrity of the food chain.

Please register at
https://secure.fera.defra.gov.uk/foodintegrity/expertdb/index.cfm to access the stakeholder/expert database
In the news “Preventing Food Crime: The UK”

Professor Chris Elliott, Director of the Institute for Global Food Security at Queen’s University Belfast, and a FI work package leader, has published his review looking at how the safety and authenticity of food supplies in the UK can be better protected in the wake of the horsemeat scandal.

In his report he discussed the development of a National Food Crime Prevention Framework.


Knowledge Base

We are building a comprehensive Knowledge Base linking each food product and its potential fraud or integrity issues to appropriate analytical strategies that can be used for food fraud detection or authenticity testing. The output is a Web-based tool for use by industry and regulatory authorities to identify, easily and rapidly, potential threats to a given food product or ingredient and the existing solutions. The Knowledge Base will contain a wealth of information including the type, frequency, and impact of the fraudulent practice, the analytical methods available, their use, cost and performance criteria, and the availability of reference data with links to literature and open-access databases.

For detailed information, click on this link: https://secure.fera.defra.gov.uk/foodintegrity/index.cfm?pageid=16

Food Fraud Early Warning System

FI is developing an early warning tool intended to help direct and prioritise industry monitoring and regulatory enforcement activities against food fraud. The tool will integrate data on known drivers of food fraud with expert knowledge of risk associated EU food supply chains and products across main food sectors. This tool, which accounts for uncertainties associated with drivers and their effect on industry and regulatory decision-making, involves four sequential analytical stages as sketched out in diagram below.

We would welcome stakeholder involvement, for more detailed information, click on this link:
https://secure.fera.defra.gov.uk/foodintegrity/index.cfm?pageid=16
The Second Conference of FoodIntegrity- Registration open!

REGISTRATION IS NOW OPEN! The 2nd FoodIntegrity conference “Assuring the integrity of the food chain: food authenticity research priorities and funding opportunities” will take place in Bilbao on 26-27 March 2015. http://www.azti.es/foodintegrity

The 1 ½ day conference will:
• Present the latest research outputs from the FoodIntegrity project:
  ▪ A European expert network on food authenticity
  ▪ A European knowledgebase on analytical methodology and databases for food authenticity
  ▪ Chinese consumer attitudes to European products
  ▪ The development of an Early Warning System for predicting food fraud
  ▪ Identifying gaps in present research
• Establish how researchers can apply to access the 2015 FoodIntegrity research calls.
• Bring together national funding bodies to establish priorities for transnational funding
• Present Horizon 2020 strategic requirements in the food sector
• Identify and address research gaps by procuring and delivering €3M of commissioned projects.

Fl at the EU Parliament

Food Integrity project has been selected as a showcase at the “EU Science: Global Challenges, Global Collaboration” (ES:GC2) Conference, which will be held in EU Parliament in Brussels on 2-6 March 2015.

The conference objective is to create an environment where scientists and policymakers can exchange knowledge and views with a view to both optimising policy options and providing the optimal regulatory and policy environment, where science is enabled.

For the registration and conference programme, please visit http://www.globalsciencecollaboration.org/ES:GC2%202015

The Fl Advisory Board

Members
James Lindsay (USDA)
Shefalee Loth (Which?)
Beate Kettlitz (Food and Drink Europe)
Barbara Gallani (FDF)
Carmen Garau (DG SANCO)
Penny Bramwell (Food Standards Agency)

Penny Bramwell
Carmen Garau
Shefalee Loth
James Lindsay
Barbara Gallani
Beate Kettlitz
Project highlights:

2nd FoodIntegrity Consortium meeting and conference and workshops – Summary:

Poster awards:
The posters winners presented in the FoodIntegrity Conference are the following:

1. Non-destructive determination of chicken filet adulteration by near-infrared spectroscopy

Yannick Weesepoel¹, Eleftheria Tzoumeleka¹, Rita Boerrigter-Ennling², Saskia Van Ruth¹²

¹RIKILT Wageningen University and Research Centre, The Netherlands,
²Food Quality and Design Group, Wageningen University, The Netherlands

2nd FoodIntegrity week, organised by AZTI-Tecnalia, was held in Bilbao, Spain, on 24-27 March 2015.

Nearly 170 delegates from 24 countries attended this event.

The week included the following events:

- 2nd meeting of the FoodIntegrity consortium (24–25 March 2015)
- 2nd FoodIntegrity conference “Assuring the integrity of the food chain: food authenticity research priorities and funding opportunities” (26 March 2015)

This conference presented the latest research outputs from the FoodIntegrity project and details of funding opportunities for research on food authenticity:

Stakeholder perspectives from regulatory, industry and consumer sectors

Latest research from FoodIntegrity
- Development of an Early warning system for predicting food fraud
- European expert network on food authenticity
- European knowledgebase on analytical methodology and databases for food authenticity
- Chinese consumer attitudes to European products

Research priorities and calls
- Establish how researchers can apply to access the 2015 FoodIntegrity research calls
- Horizon 2020 strategic requirements in the food sector
- Future research on food authenticity
2. A non-targeted fingerprinting approach for authenticity testing of spices and herbs using spectroscopy and chemometrics
Janet Riedl, Carsten Fauhl-Hassek, Susanne Esslinger
Federal Institute of Risks Assessment, Berlin

3. High efficient DNA extraction from oil samples through microscale solid phase extraction (μSPE) on functionalized micropillars
Marta Prado, Karola Böhme, Lorena Diéguez
INL – International Iberian Nanotechnology Laboratory, Braga, Portugal

- **Series of workshops (27 March 2015)**

  - **Keeping safety and integrity in the food chain: A view from many sides**
  
  Food integrity and food authenticity are new buzz words, defined in part as undiminished foods that are in perfect condition. The SAFE consortium message is that food safety is an integral part of food integrity: a food whose origin is unknown cannot be assured to be safe. At this workshop, leading research scientists, industry representatives, consumer groups and regulators addressed the intersection of food safety and food integrity.

  - **Formation of a Network of Excellence for Food Authenticity Analysis: The Key Challenges**
  
  The aim of this workshop was to formulate the rationale for a Network of Excellence (NoE) for Food Authenticity. The key objective of the proposed NoE will be to help solve the large number of challenges associated with Food Authenticity including (i) the development and standardisation of sampling and detection methodology for a wide range of foodstuff, (ii) information and technology transfer, (iii) formation of working groups and (iv) staff exchanges between participating laboratories.

  - **Early Warning System**
  
  The eventual goal was to identify food products and ingredients most susceptible to food fraud and rank these according to industry experts’ beliefs about levels of fraud risks with these products and ingredients, considering a number of relevant key factors including the characteristics of products and ingredients and supply chains, the existing industry and regulatory capacity to detect fraud and level penalties faced by fraudsters operating in these chains. The information gathered at the workshop will feed into the development of an early food fraud warning system designed to help industry and regulators to better anticipate possible fraud incidents across main food supply chains.

For more information and presentations visit FoodIntegrity website [here](#), conference website [here](#), or Book of Abstracts [here](#).
FoodIntegrity first project results:

**FoodIntegrity Knowledge base: and information resource on food authenticity, description of the database and progress achieved so far**

FoodIntegrity aims to bring together available information on suitable analytical tools and associated reference data for the detection of food fraud in a Knowledge Base, to facilitate access to this information for industry, regulatory authorities and research organisations.

The main work carried out so far has been devoted to designing and developing a suitable structure for the online searchable FoodIntegrity database. This tool will provide a central resource that maps methods onto commodities and authenticity questions - a Web tool with details of major food commodities, potential food fraud issues, and links to existing methods and associated analytical data if available.

**Industrial perspective of relevant food chains vulnerabilities vs Current analytical methods and technologies that can be applied**

FoodIntegrity aims to bring together available data on industrially exploited analytical tools for detection of food fraud, and identify reliable indicators/markers to use for horizon scanning of possible fraud events.

Relevant feedbacks from either a number of different areas (vendor assurance, quality assurance, purchasing department, R&D, etc...) or a number of suppliers/co-packers and industrial stakeholders along many different supply chains were collected, rationalized and combined, with regard to the application of analytical methodology, traceability issues, consumer issues and communication/media effects/repercussions.

Useful information was selected, extracting from all the methods, according to the problems, which is considered the most reliable one and which are the gaps in the sense of industry monitoring and control needs.

This permits to facilitate further prioritization-procurement setting phases and to better and exhaustively integrate extensive databases on analytical techniques and their application status/validation.

**Chinese consumer attitudes to food fraud, short description of the survey and its outcomes**

A number of highly publicised food scares have negatively impacted Chinese consumers’ confidence in Government controlled food inspection and certification schemes. FoodIntegrity research examined Chinese consumers’ attitudes and perceptions towards the safety and integrity of imported European foods. Although European food products are usually associated with high standards in production, labelling and safety, these trusted ‘credence’ attributes make some imports susceptible to imitation and counterfeiting.

The Qualitative method of focus groups was conducted in three Chinese cities Beijing, Guangzhou and Chengdu. The research investigated the psychological factors underpinning attitudes towards food safety and the perceived authenticity and traceability claims associated with (i) infant formula milk, (ii) olive oil, and (iii) Scotch whisky.

Participants perceived food safety to be problematic and recognised fraudulent activities associated with European food imports. The degree of ‘outrage’ depended upon the potential severity of the implications for their health. Food safety concerns were framed in terms of ‘cumulative long term effects’ and included chemical and physical concerns. Barriers to perceived food safety were underpinned by perceptions relating to (i) a lack of confidence and skills to judge food quality and safety, and (ii) the resulting inability to make an informed choice about food purchasing decisions. A number of risk relieving strategies associated with purchasing and evaluating foods and domestic practices were identified to compensate for perceived food safety risks.
Survey of the Olive oil sector, short description of the survey and its outcomes

FoodIntegrity has conducted a research to understand the current problems and sensitivities of the olive oil market. A series of questions have been presented to the different actors on olive oil field: farmers, producers, importers/exporters, retailers, regulatory bodies, analysts and consumers.

The aim was to know their opinion and to identify the research needs about different aspects related to quality, traceability, regulation, standard methods and other issues. The objective was also to identify current and incipient problems that directly concern the production, commercialisation and consumption of this product. In order to favour the distribution of the survey into actors, it has been translated into different languages and distributed all over the world. Inputs from project partners allowed selection of the questions that are the most relevant in the sector today.

The questions dealt with many of the most controversial issues today, and therefore significant number of questions related to traceability was also included. Answers from more than 20 countries have been collected; from more than 700 answers, 63% corresponded to consumers. In general terms, the survey revealed a concern in quality and safety regarding olive oil traceability and divided opinion in some issues related to labelling and authenticity tools.

OLIVE OIL SECTOR: You can still contribute !!!
Survey to understand the current problems and sensitivities of the olive oil market
Please express your opinion in a free and anonymous way here.

SEAFOOD SECTOR:
Survey to understand the misdescription incidents in seafood sector (HOtels, REstaurants, CAfes)
Please take your time, help us and will get into the prize draw to win an amazing prize!
More information on procedure for samples’ collection can be found here.

Identifying the gaps in current research on food authenticity – FoodIntegrity research procurement:

The FoodIntegrity project will commission €3M of research in the area of food authenticity and traceability, in 2015. There is a call for proposals to address the four topics that were identified from a comprehensive gap analysis with stakeholder input and evaluation. Deadline to submit a project proposal is 14th August 2015. More details can be found here.

Dissemination activities: JOIN US at FoodIntegrity EVENTS!

1st FoodIntegrity Open day at RAFA 2015 will be organised as satellite event of the 7th International Symposium on Recent Advances in Food Analysis (RAFA 2015), on 4-5 November 2015, Prague, Czech Republic.
You can join us and discuss with FoodIntegrity experts the latest developments and strategies in the field of food integrity - safety, quality, authenticity and traceability. Please register at RAFA 2015 here.

3rd FoodIntegrity conference will be organised on 6-7 April 2016 in Prague, Czech Republic.
Two days conference will present the latest research outputs from the FoodIntegrity project including e.g.:
• New activities on (i) Non targeted analysis, (ii) Complex foods, (iii) Transparency along the food chain, (iv) Rapid methods
• Food Fraud System in the EU (and beyond – worldwide network)
• Demonstration how a European knowledgebase on analytical methodology and databases for food authenticity can be exploited by stakeholders
• Analytical tools for food authentication
• Data processing and interpretation in the context of regulatory requirements
• 2nd workshop on “Developing a network of expertise in food analysis” aimed at formulation of the rationale for establishing of the proposed Network of Excellence (NoE) for Food Authenticity
How to get involved?

Do you wish to receive information about news, progress and events related to the FoodIntegrity project?
Please register for the project COMMUNICATION here.

Do you wish to become a FoodIntegrity stakeholder and be able to affect or be affected by FoodIntegrity project activities?
Please register as a FoodIntegrity STAKEHOLDER to the FoodIntegrity Network here.

Do you wish to become a FoodIntegrity expert and be called in for an advice and/or contribution to the project activities?
Please register as a FoodIntegrity EXPERT to the FoodIntegrity Network here.

The FoodIntegrity Network is a platform for stakeholders and experts to exchange knowledge and expertise in food authenticity, safety and quality; and to rapidly share information and intelligence about suspected and actual incidents to protect consumers and food products from damaging effects of food misdescription. The overall objectives of the FI Network is to bring together producers, distributors, processors, retailers, regulators, researchers enforcers and consumers to assure the integrity of the food chain.

Dates for diary:

**FoodIntegrity Associated events:**

**7th International Symposium on Recent Advances in Food Analysis (RAFA 2015)**
3-6 November 2015, Prague, Czech Republic

FoodIntegrity Open day at RAFA 2015
4-5 November 2015, Prague, Czech Republic.

**3rd FoodIntegrity conference**
6-7 April 2016, Prague, Czech Republic

**External events:**

**EUROANALYSIS 2015**
6-10 September 2015, Bordeaux, France

**129th AOAC Annual Meeting & Exposition**
27-30 September 2015, Los Angeles, California, USA

**4th MS-food Day**
7-9 October 2015, Foggia, Italy

**EUROFOODCHEM XVIII**
13-16 October 2015, Madrid, Spain

**29th EFFoST International Conference**
Food Science Research and Innovation: Delivering sustainable solutions to the global economy and society
10-12 November 2015, Athens, Greece

We hope you have found this e-Newsletter interesting and informative. We would welcome your views on any of the issues covered. Please email foodintegrity@fera.co.uk.

Please feel free to distribute this FoodIntegrity e-Newsletter to other interested parties.

**Disclaimer:**
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If you wish to unsubscribe for the FoodIntegrity e-Newsletter, please reply to foodintegrity@fera.co.uk, with “Unsubscribe newsletter” in the e-mail subject.
Welcome to the third FoodIntegrity Newsletter. This five-year European project is now entering its core phase with many activities in progress, exploiting the competence and energy of its 38 partners from Europe and China.

In this edition, I hope to have given you a flavour of what is to come in the battle against food fraud and adulteration: from analytical to paper trail approaches, from databases and how to use them to consumer opinions and behaviours. One of my key roles in being an industry partner in the project is to fully understand the opportunities that this multi-faceted project presents to food businesses. A recent highlight for me was the successful FI satellite event at the Milan EXPO, conceived as an opportunity for stakeholders (with focus on Italian industries) to share common relevant issues combined with best practices and to develop collaborations with international experts.

As a food scientist, I particularly enjoyed RAFA 2015 and taking part in the FI Open Days that took place there, where hundreds of attendees were provided with demonstrations of the state of the art in food authentication. As a potential end-user, I am eagerly awaiting the release of the FI Knowledge Base Web-based Tool that, I hope, will solve my problems in terms of which method to use for a particular food fraud problem.

2016 will also be the year of the launch of several new exciting sub-projects identified by stakeholders, including other industry colleagues, which address gaps in our current knowledge. Finally, we have introduced an “Opinion Corner” in this newsletter, where, this time, we speak about how the analytical methods are not always the key to solve all problems related to fraud.

There are many different ways by which you can get involved with the project, meet with us and get to know our strategy for protecting the integrity of food production in Europe! Ciao!

Michele Suman, Barilla Advanced Laboratory Research, Guest Editor

Agribusiness: Science & Industry to talk about fraud - Milan (Lodi) - EXPO2015 joint initiative – Summary:

The Italian office of the UK Science Innovation Network (SIN Italy) organized, in collaboration with the FoodIntegrity European Project and Parco Tecnologico Padano (PTP), a two-day workshop which took place on 9th and 10th of September at PTP in Lodi (Milan). The event, a satellite initiative to Milan EXPO, involved over 60 participants drawn from leading businesses, scientific organisations and academic establishments from the UK, Italy and North America. Its aim was to share best practice and boost exchange and collaboration opportunities between UK and Italian scientists, as well as other European and international colleagues.
The first day focused on sharing and debating the latest research methods and processes for combating food fraud and demonstrating the state-of-the-art tools for assuring the authenticity of food products. The second day was opened up to Italian food companies that presented how current research is developing practical mitigation tools. This was followed by an interactive exercise led by the UK Food and Drink Federation (FDF) encouraging participants to consider vulnerabilities to specific supply chains, with a view to protect their businesses from food fraud by using information and intelligence to inform their risk assessments and assurance actions. The FDF Five-step Guide on Food Authenticity was presented to participants who were then asked to apply each of the five steps (Map Your Supply Chain; Identify Impacts, Risks and Opportunities; Assess and Prioritise Your Findings; Create a Plan of Action; Implement, Track, Review and Communicate) to realistic scenarios.

The open discussion with food industry representatives from different food chains (oils, eggs, retailers, ...) started in Lodi and continued directly in collaboration with FoodIntegrity Work Package 10 (Industrial Integration), highlighting some interesting key points such as:

- The vulnerability of “highly fragmented” chains (with a high number of steps, players, geographical areas...)
- The absence, in most cases, of implementation of rapid screening procedures, especially in the case of SME
- The stable recourse to the support of external labs for outsourcing confirmatory analytical measurements
- The need to better establish separated assessments and prevention models for safety and authenticity issues
- The desire to achieve a standardized data base for food profiling sharing the data into the scientific community
- The parallel need to find confidential channels for knowledge exchange
- The suggestion to make efforts on reducing the economic impact of “databases re-construction” year by year
- The close future direction to transfer many food testing, still nowadays, at the “research stage” into a “routine scenario”

**USEFUL LINKS**


**FoodIntegrity OPEN DAYS at RAFA 2015 – A big success!**

1st FoodIntegrity Open Days were organised on the 4-5 November 2015, during the 7th International Symposium on Recent Advances in Food Analysis (RAFA 2015), held from 3rd to 6th November 2015 in Prague, Czech Republic.

The aim of the open days was to provide participants with a demonstration of the some of the latest outputs from project and to let participants know how to get involved. The audience were exposed to live tasting, video, slide shows and live demonstrations of the latest methods for authentication of spirits.

Participants learned more about:

- FoodIntegrity Network and how to get involved
- FoodIntegrity Knowledge (data)base
- rapid methods for authentication of branded spirits
- an industrial perspective of food chain vulnerabilities vs current analytical methods and technologies
- training and dissemination activities in progress
Sensory analysis of olive oils: Can you recognize the adulterated product?

Videos & Slide shows: Chinese consumer attitudes to food fraud, Industrial Integration approaches

“Hands on” demonstration of authentication of spirit drinks

MicroNIR analysis of cheese adulteration

Sensory tasting: Can you tell the difference between wild and farmed salmon?

RAFA also included a workshop on “Vibrational spectroscopy and chemometrics for monitoring of food and feed products and contaminants’ detection”. The aim of this workshop was to give an overview of the theoretical and practical issues for the right applications of spectroscopic techniques in food and feed quality control, detecting non-conformity and subsequently identifying targeted or untargeted adulterants and contaminants among others.

Finally, an intriguing RAFA 2015 Filmed Roundtable Discussion was hosted by New Food Journal on the topic of contaminants and novel approaches in food analysis, also covering aspects directly related to FoodIntegrity.

USEFUL LINKS
FoodIntegrity first project results:

FoodIntegrity Knowledge Base: ready to start!

The FoodIntegrity Knowledge Base Web-based Tool will provide a wealth of information on the type, frequency, and impact of various food fraud practices together with recommended analytical strategies to deal with the issues. The overall structure is now in place and the task of entering available information is underway. The search engine for the Knowledge base has now been designed. When looking for information, the stakeholder will be able to select a food category from a drop-down list, enter a CN code and/or specify a type of fraud (dilution, substitution, etc.) or food integrity issue (geographical origin, product composition, etc.). It will also be possible to find information by using a wildcard search and searching for multiple words separated with AND / OR / AND NOT in upper case. A simple click on the “Get Results” button will bring up all relevant data entries in tabular format, from which it will be possible to display individual or previously selected entries. An additional click will export the selection to a PDF file. Work will continue over the next few months to compile initial data into the Knowledge Base. The aim is to hold a live demonstration at the 3rd FoodIntegrity conference in Prague in April 2016.

USEFUL LINKS
- Fl Knowledge Base – an update on how work is progressing (https://secure.fera.defra.gov.uk/foodintegrity/secure/downloadFile.cfm?id=350)

FoodIntegrity Call for New Research procurement update:

Call Opened: 24th June 2015
83 initial expressions of interest
Call Closed: 14th August 2015
27 proposals submitted
- 2 proposals - FI01 - Standardisation and harmonisation of untargeted food integrity methods
- 7 proposals - FI02 - Innovative approaches to assure the integrity of complex foods
- 7 proposals - FI03 - A feasibility study of how information can be shared along the supply chain to identify risks to the integrity of food
- 11 proposals - FI04 - Rapid, on-site, cost effective methods for feed/food fraud detection

Expected Results: Late December 2015
Start Date – February/March 2016

FoodIntegrity “Opinion Corner”:

“When all you have is a hammer, everything looks like a nail – when analytical methods are not enough…”

This was the slightly provocative title of the presentation given by FoodIntegrity WP6 leader, Petter Olsen, at the RAFA conference in Prague in the beginning of November 2015. The ‘hammer’ in the title refers to the ‘golden hammer’ approach formulated by Maslow and others, and in the context of food authenticity, it refers to the fact that that sometimes the starting point seems to be the methods we know rather than the problem we’re trying to solve. The presentation included an overview of food fraud types and food attribute types, and showed that while analytical methods can identify many types of food fraud and false claims, they can by no means identify all. A common problem is in thinking that food fraud is always closely connected to food safety, and this is not necessarily true. For example, it is estimated that between 10 and 30 percent of all captured fish products traded in the world originates from Illegal, Unreported or Unregulated (IUU) fisheries, and records are routinely falsified when this fish enters the legal supply chain. While this is a big problem in relation to stock sustainability and is an economically motivated fraud, there is little reason to suspect that there are food safety issues associated with this fraud and it is difficult to envisage analytical methods which could identify the products originating from IUU fisheries. The same goes for many claims relating to exact geographical origin (including country), original volume or weight (relevant when quotas are involved), owner and batch number as well as many of the properties relating to organic production, sustainability or ethics. While there is a physical or biochemical component associated with some of these claims, it is by no means true for all of them, and analytical methods cannot really be used to identify fraud or misdescription related to these attributes. The presentation outlined some complementary methods based on data recorded in the supply chain; specifically input-output analysis (matching for instance stated export weight or volume with corresponding stated import weight or volume) and mass balance
analyzing processes with unrealistically high claims when it comes to yield). These methods will be used and further developed in the FoodIntegrity project and they will become part of the integrated anti food fraud toolbox that will be made publicly available towards the end of the project.

USEFUL LINKS
- Solving Food Frauds – Food Quality News

Note that the FoodIntegrity seafood sampling citizen science experiment is currently running. Volunteers from all over Europe take samples when they eat seafood at restaurants, note down the stated species, and send the samples for analysis and verification. Please contact Miguel at AZTI if you want to participate; mpardo@azti.es.

Dissemination activities:

FoodIntegrity & FAO/IAEA Coordinated Research Project on “Implementation of Nuclear Techniques to Improve Food Traceability”
On 26-30 October 2015 in Kampala (Uganda), The Food and Environmental Protection Laboratory of the Joint FAO/IAEA Division in Vienna, Austria, (active in FoodIntegrity WP1, WP2 and WP10) organized the final research meeting of a 5-year international research project focusing on food traceability and safety, in particular the development and implementation of nuclear technologies for the verification of the authenticity of food.
(https://secure.fera.defra.gov.uk/foodintegrity/secure/downloadFile.cfm?id=351)

FoodIntegrity at the “2ND PARMA NANO-DAY” SITEIA/University of Parma Workshop
FoodIntegrity opened a window on nanotechnologies and food traceability/authenticity implications in the Workshop “2ND PARMA NANO-DAY”, 3-4 December 2015, in the Auditorium of the Science Campus – University of Parma. The workshop was organised in three Scientific Sessions: (i) Technological applications; (ii) Agri-food, Environment, Biotechnologies; (iii) Health and wellness.
(https://secure.fera.defra.gov.uk/foodintegrity/secure/downloadFile.cfm?id=354)

3rd FoodIntegrity conference ‘Assuring the integrity of the food chain: Fighting food fraud’ will be organised on 6-7 April 2016 in Prague, Czech Republic. The two day conference will focus on the latest research outputs from the project and beyond, including:
- New project activities on (i) Non targetted analysis, (ii) Complex foods, (iii) Transparency along the food chain, (iv) Rapid methods
- Food Fraud System in the EU (and beyond – worldwide network)
- Demonstration how a European knowledgebase on analytical methodology and databases for food authenticity can be exploited by stakeholders
- Analytical tools for food authentication
In addition, series of workshops will be organised to include: (i) Food Crime, occurrence, motivations and mitigations, (ii) Industrial applications for assuring food authenticity (technical workshop on analytical approaches for food authentication), (iii) Authenticity of herbs and spices, (iv) Citizen science potential approaches to food integrity

For information on the conference please check the conference website (www.foodintegrity2016.eu) regularly or contact us at foodintegrity2016@vscht.cz.

First results of the FoodIntegrity research published by Yamine Bouzembrak and Hans J.P. Marvin on ‘Prediction of food fraud type using data from Rapid Alert System for Food and Feed (RASFF) and Bayesian network modelling’ (Food Control (2016) 61, 180-187). Review paper ‘Review of validation and reporting of non-targeted fingerprinting approaches for food authentication’ by Janet Riedl, Susanne Esslinger and Carsten Faulh-Hassek (Analytica Chimica Acta (2015) Volume 885, 17–32) cited FoodIntegrity as one of the projects that contributed to formulation of these approaches.

Training activities
For the efficient knowledge transfer of developed technologies and other information generated within the project framework, training network will be established, consisting of a comprehensive training program, a young scientist mobility program, establishing a training school, and the organisation of a series of workshops.

The training program will be launched soon. If you wish to be informed on opportunities offered by the training program, please register for project COMMUNICATION here.
How to get involved?

Do you wish to receive information about news, progress and events related to the FoodIntegrity project?
Please register for the project [COMMUNICATION](#) here.

Do you wish to become a FoodIntegrity stakeholder and be able to affect or be affected by FoodIntegrity project activities?
Please register as a FoodIntegrity [STAKEHOLDER](#) to the FoodIntegrity Network [here](#).

Do you wish to become a FoodIntegrity expert and be called in for an advice and/or contribution to the project activities?
Please register as a FoodIntegrity [EXPERT](#) to the FoodIntegrity Network [here](#).

The **FoodIntegrity Network** is a platform for stakeholders and experts to exchange knowledge and expertise in food authenticity, safety and quality; to rapidly share information and intelligence about suspected and actual incidents to protect consumers and food products from damaging effects of food misdescription. The overall objectives of FI Network is to bring together producers, distributors, processors, retailers, regulators, researchers enforcers, consumers to assure the integrity of the food chain.

Dates for diary:

**FoodIntegrity Associated events:**

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
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<tbody>
<tr>
<td>3rd FoodIntegrity conference ‘Assuring the integrity of the food chain: Fighting food fraud’</td>
<td>6-7 April 2016</td>
<td>Prague, Czech Republic</td>
</tr>
<tr>
<td>Training in Vibrational Spectroscopy and Chemometrics</td>
<td>19 February – 4 March 2016</td>
<td>CRA-W Henseval Building Gembloux, Belgium</td>
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**External events:**

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<th>Event</th>
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<tr>
<td>18th International Union of Food Science and Technology (IUFoST) World Congress</td>
<td>21–25 August 2016</td>
<td>Dublin, Ireland</td>
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<tr>
<td>1st Food Chemistry Conference ‘Shaping the Future of Food Quality, Health and Safety’</td>
<td>30 October – 1 November 2016</td>
<td>Amsterdam, Netherlands</td>
</tr>
<tr>
<td>‘World Mycotoxin Forum meets IUPAC’</td>
<td>6-9 June 2016</td>
<td>Winnipeg, Canada</td>
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www.foodintegrity.eu

Please contact us at [foodintegrity@fera.co.uk](mailto:foodintegrity@fera.co.uk) with any suggestions for improvement.
Welcome to the fourth FoodIntegrity Newsletter. This five-year European project, led by Fera Science Ltd, is now in full swing, nearly entering its 4th year. In this edition, we will be updating you on the €3 million of new FoodIntegrity research that just started, the latest results from the project, conferences and finally recent advances in the fight against food fraud.

The new research topics in the areas of non-targeted analysis, complex matrices, transparent food chains and rapid methods added another 22 of the best European research organisations to the project bringing the total number of partners to 60!

Finally, we welcome the new members of the FoodIntegrity Advisory Board: Chair Michele Lees “retired”, Peter Whelan (FSA Ireland) and Lucy Foster (DEFRA UK) who join existing members John Spink (Michigan State University), Sue Davies (Which UK), Eric Marin (DG SANTE) and Beate Kettlitz (Food & Drink Europe) on the Board.

There are many different ways by which you can get involved with the project and keep up to date with news, events and activities, so don’t hesitate to visit our web site at www.FoodIntegrity.eu or sign up as an expert or stakeholder in the FoodIntegrity Network.

Please contact us (foodintegrity@fera.co.uk) with any suggestions for improvement.

Paul Brereton, Verda Fazlic and Claire Sykes, Fera Science Ltd.

FoodIntegrity New Research:

Following a year long gap analysis and stakeholder consultation exercise the following four areas were identified for FI investment in terms of procuring new research:

- Standardisation of non targeted analysis
- Rapid methods
- Authentication of complex foods
- Transparency along the food chain

Following an international tendering exercise, 27 proposals were submitted and evaluated by an independent panel of experts with the following 8 projects being successful and are in progress.

- **Consumer and Brand Protection in Complex Foods from Protein Signatures Using Mass Spectrometry**
  This team will be using Multiple Reaction Monitoring Mass Spectrometry to demonstrate the use of peptide markers in the various components of processed foods, as a consumer and brand protection method.

  **LED BY:** Institute of Food Research (UK)
  **PARTNERS:** Gdańsk University of Technology (PL) & Westfälische Wilhelms-Universität Münster (DE)

- **From nutritive seeds to complex foods: Markers of composition and stability along the food-production chain**
  The aim of this study is to find molecular markers to verify the authenticity of chia, flax and sesame seeds and their...
presence in complex/processed foods.

**LED BY:** Instituto de Ciencia y Tecnología de Alimentos Córdoba, (AR)

**PARTNERS IN WORK PACKAGE:** Max Planck Institut für Molekulare Pflanzenphysiologie (DE)

- **F.I.S.Hub – Fish Identification Software Hub**
  The main objective of the F.I.S.HUB project is to develop a software tool for a portable device to be used in the field to detect species substitution.

  **LED BY:** Istituto Zooprofilattico Sperimentale del Piemonte Liguria e Valle d’Aosta

  **PARTNERS IN WORK PACKAGE:** Politecnico di Torino(ITA) & University of Salford (UK)

- **Check – X: Improving Supply Chain Integrity through Data Sharing**
  This project will conduct a feasibility study of how to better share information along the supply chain to identify risks to food integrity.

  **LED BY:** Organic Services GmbH (DE)

- **Feasibility study on information sharing and analysis along the food chain to identify emerging food integrity issues.**
  This study intends to demonstrate the technical possibilities of sharing information without competition issues and the potential of information analytics to identify food integrity issues at an early stage.

  **LED BY:** TNO (NL)

  **PARTNERS IN WORK PACKAGE:** University of Gent (BE)

- **INTELLitrace**
  Improving comprehensive artificial intelligence, validation and harmonization methods as “functional bridge” between untargeted analytical approaches and food tracking/authenticity within the Food Integrity field

  Main objective of this project is the development and validation of a comprehensive supervised or unsupervised protocol, that could be used to exhaustively process large data sets originated from untargeted analyses.

  **LED BY:** UPO (IT)

  **PARTNERS IN WORK PACKAGE:** ICETA (PT), Thermo Fisher GmbH (DE), Cherlab SRL (IT) & Consiglio Nazionale delle Ricerche (IT)

- **NIRS microsensors and ICT platforms for ensuring on-site authentication of high added value European foods: Case study Iberian pig ham**
  This project aims to evaluate, fine-tune, validate and implement a portable miniaturised NIRS spectrometer for on–site application to Iberian pork carcasses at the slaughterhouse.

  **LED BY:** University of Cordoba (UCO)

  **PARTNERS IN WORK PACKAGE:** University College London (UCL), Iberco de Bellota SA (ES) & AB-Agri (UK)

- **Integrity of complex foods: innovation in analysis and communication**
  This project aims to provide stakeholders with SOPs and position papers for analysing complex foods authenticity and communicating to consumers.

  **LED BY:** Consorzio Italbiotec (IT)

  **PARTNERS IN WORK PACKAGE:** Danmarks Tekniske Universiteit (DK)

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**FoodIntegrity Project Results:**

**Chinese Consumer Study:**

As consumers are the ultimate customer for any product, it is vitally important to know their concerns, perceptions and attitudes regarding food safety and quality. Food authenticity, and the extent to which consumers perceive it as an issue, may influence their purchase behaviours as well as their trust in food policies and the food industry. Fi has just completed a study looking at Chinese consumer attitudes to European food products. An international group led by Prof Lynn Frewer from Newcastle University undertook the two year study. The study involved 6 focus groups of Chinese consumers informing on the concerns held by Chinese consumers in relation to food safety and authenticity. The results were then used to compile a survey of 850 participants. Prof Frewer’s team found that the greater the level of concern about food safety, the greater the perceived risks associated with food safety, and quality. In addition, the perceived benefits of authenticity increased with increased risk perceptions. Authenticity cues, including association with European products, “guaranteed” food safety, quality and authenticity. The research concluded that demonstrating authenticity improves the trust of Chinese consumers in the food system, and policies designed to ensure consumer protection.
FoodIntegrity Publications:


Paul Brereton, Verda Fazlic and Vahid Mojtahed, FoodIntegrity - a European initiative to fight food fraud - Food Science and Technology, Volume 30, Issue 2 (http://www.fstjournal.org/features/30-2/food-integrity)


FoodIntegrity Events:

The 3rd Annual FoodIntegrity Conference: Prague, Czech Republic - Assuring the integrity of the food chain: Fighting food fraud

With over 250 participants from 37 countries and comprising 43 lectures, over 100 posters and three workshops, the event explored subjects ranging from Food Crime, latest technology, industry applications, early warning systems and a dedicated session on herbs and spices. (http://www.foodintegrity2016.eu/index.html)

USEFUL LINKS: Book of Abstracts can be downloaded here. Final FoodIntegrity 2016 program can be downloaded here


Other FoodIntegrity supported events that have taken place in 2016:

Geographic Origin and Authenticity of Food Products: from Tools to Legislation” Workshop, Faculdade de Ciências da Universidade de Lisboa, Portugal, 4 July 2016

China International Food Safety & Quality Conference , Shanghai, China, 2 - 3 November 2016 (http://www.chinafoodsafety.com/index.htm)

OPINION CORNER:

FoodIntegrity Early Warning System – Vahid Mojtahed

FoodIntegrity project has dedicated a set of activities to the development of an early warning system for food fraud and adulteration detection. These activities span around three main pillars: i) systematically collecting and analysing relevant information whether be triggers of a food fraud incident or hinting an emergent risk, or records of past fraud events; ii) developing innovative models for quantifying and estimating the likelihood of fraud events, and iii) assessing the health, environmental and economic impacts of food fraud incidents.

Research around the first pillar focuses on text and data mining algorithms that analyses market and non-market data that could collectively raise red flags about fraudulent attempts and schemes. Data collected about the past events can also help us to calibrate the models and build a prior about the types of fraud and the commodities most susceptible to fraudulent schemes. The second and more ambitious exploration will focus on estimating the prospects of an environment susceptible to food fraud. This part of the study is retrospective and tries to establish a link between the past incidents and the triggers of those events. A wide spectrum of data such as change in regulations, custom tariffs, costs of production, consumers’ attitude, etc. is required to comprehensively study the relationship between the causes and effects of fraud in variety of agricultural and food products. Last but not least, the third objective of this work package is assessing the negative impacts of food fraud incidents to the society, environment, and the industry. A non-exhaustive list of such impacts include erosion of consumers trust, recall costs, damage to brands, medical costs, loss of lives, adverse media, waste disposal, change in carbon footprint. All in all, the set of these activities will help the producers, retailers or authorities to allocate their resources more efficiently to preventing the food frauds from happening.

Dates for diary:

Vibrational Spectroscopy and Chemometrics Training Session 13 March—17 March 2017

The training will be hosted by the Valorisation of Agricultural Products Department (Henseval Building) of the Walloon Agricultural Research Centre (CRA-W) in Gembloux

https://secure.fera.defra.gov.uk/foodintegrity/secure/downloadFile.cfm?id=401

For the 10th consecutive year, the CRA-W organises a complete training on vibrational spectroscopy and chemometrics.

In this 10th anniversary training you will have a complete overview of the theory of the spectroscopic and chemometric methods most commonly used. This will be completed with dynamical practical sessions in multidisciplinary laboratories, which will give you some tips and tricks useful when dealing with spectroscopy and chemometrics.

The 4th Annual FoodIntegrity Conference: Parma, Italy 10-11 May 2017

Assuring the integrity of the food chain: Turning science into solutions

TOPICS OF PLENARY AND PARALLEL SESSIONS
- Food safety implications within food authenticity & traceability strategies
- Counterfeiting of food & public health impact: EU law enforcement agencies
- Faster/cheaper, accurate, multi-target, non-targeted analytical directions
- Risk management strategies against food frauds
- Food Integrity in a global perspective

WORKSHOPS
Good risk management requirements, trust in labels-claims & best practices
GAPs analysis & future prioritization

USEFUL LINKS: http://foodintegrity2017-parma.eu/
How to get involved?

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Please contact us at foodintegrity@fera.co.uk with any suggestions for improvement.
Welcome to the fifth FoodIntegrity Newsletter.

Since you received the last Newsletter in December 2016, a lot has happened in the FoodIntegrity Project. Some of the Work Packages have been wound-up, while the new WPs that came on board during last year are now in full swing.

Paul Brereton and his colleagues at Fera Science were engaged with chasing WP leaders for reporting and accounting, and the preparation of the Parma annual conference kept everybody busy.

The Parma conference that was prepared under the leadership of Michele Suman, Barilla together with Elena Maestri, University of Parma and Monika Tomaniova, University of Chemistry and Technology Prague, and naturally Fera Science, was the highlight of this year’s activities; read more below. I must express my and the gratitude of all participants for the outstanding organisation, the scientific excellence of the programme as well as the ‘fun part’, that went well into the night.

But even before the conference was inaugurated, internal WP meetings took place followed by the full meeting of the FoodIntegrity Project, including short presentations of all WP’s status including results. The Research Programme Officer, Alexandra Tuijtelaars, of the European Commission was present during the meeting and the conference, underlining the Project’s high standing.

Enjoy reading and have a nice summer!

Gerald A. Herrmann - Organic Services
g.herrmann@organic-services.com

Guest Editor

FoodIntegrity Conference: Parma, Italy 10-11 May 2017

‘Assuring the Integrity of the food chain: Turning science into solutions ‘was the perfect title for the 2017 FoodIntegrity Conference in Parma, and the conference delivered. Conference organisers together with conference committees, supported by the FoodIntegrity Project coordination from Fera Science offered a seamless framework and programme to advance discussion and practical applications furthering food integrity. With about 350 participants from all sectors of science, industry and organisations, the conference grew impressively compared to the 2016 Prague conference confirming the growing importance of food integrity for protecting consumers from fraud and adulterated food.

The opening and morning sessions invited participants to broaden the view from their particular research and work topics to presentations about food authenticity (EFSA, Parma), QM-systems against food fraud (IFS, Berlin) and intellectual property aspects (IPO, Newport) and economic aspects (MIPAFF, Rome) setting the stage for ‘New Solutions for Identifying Emerging Risks’ presented by FoodIntegrity Project Work Package participants.

When listening to Federico Pizzarotti, the Mayor of Parma, who opened the conference and praised the long history and today’s food culture of Parma, the excellence of food and its regional artisanal provenience, my mouth watered – the real food offered during the evening underlined his comments. My thoughts drifted to the regular consumers, whom this project is working to protect and who are in the dark about the many frauds ongoing in the world today. On another note, the use of social media for preventing food fraud was also touched on, and we promise to keep you informed on this topic in future issues.

ANNEX:5
infection outbreaks and the work on big data algorithms for detecting fraud even before it happens was enlightening. After intense discussions that we had for our Work Package with Food Criminologists, I have some doubts whether the erratic and spontaneous ‘grab the opportunity’ nature of fraud can be detected with such tools, though I do hope to be proven wrong.

The two afternoon parallel sessions of the first day focused on ‘Rapid & Confirmatory analytical solutions’ with presentations of latest scientific and technical solutions and with a ‘Workshop on Good risk management requirements, trust in label claims & best practices’. The Workshop was a very lively and participatory experience – an excellent setting for engaging participants. This Workshop deepened the themes of economic significance and importance of label claims (the examples chosen were PDO/PGI and organic foods), and how to best promote trust in premium products. The two sessions stressed the importance and necessity of looking at food integrity from a systems’ as well as from a testing perspective.

As I was invited to give a short presentation about how the Italian organic sector is building integrity by fighting fraud in cereal supply chains (after having been hit by a number of serious scandals with selling non-organic grain as organic), I could not attend the session on Analytics. My workshop on organic and PDO/PGI, which I was part of the moderation team was inspiring. I am always impressed to see to what extent the still very, very small organic and PDO/PGI food sector has already impacted thinking and strategizing. The attitude by participants of the workshop to analyse and transfer the systematic approach of ‘standard – inspection – certification – transparency’ to the food sector at large and as an anti-fraud tool was motivating.

The afternoon was rounded off with ‘Fast Science’ speed presentations, a challenge for presenters as time was limited for presenting complex topics. The format engaged the audience who saw some impressive innovative presentations, excellent for a speedy overview and later follow-up with presenters. Before closing off the day 6 young food integrity scientists presented their research results and were awarded, fervently applauded by the audience for both, the results of their work but also for their professional, outstanding presentations.

The second day started off with two parallel sessions on ‘Food Integrity 2020 Challenges – Unresolved and Emerging gaps’ and ‘Consumer issues: quality vs convenience – satisfying consumer needs’. With these two topics, the FoodIntegrity Project and the Organising Committee underlined the strategy of embracing all aspects of food integrity, looking beyond the already known and to addressing the expectations of the target group: the consumer!

Participating in ‘Consumer Issues’ I found yet another time that the special attention the Italian “Carabinieri NAS” is paying to food adulteration and fraud is of special performance across the EU. The balance between the necessary pungency in its activities and the realistic view on what can be achieved were presented well.

The last session of the conference centred on the ‘Forward Look’ and presented inspiring perspectives of more general nature, while at the same time being concrete: “we need a global definition of what is food integrity”, “we need to be realistic about what can be applied in practice and how we can finance the wished actions”.

The closing session was one of my highlights with presentations about the ‘global perspective’, ‘EU challenges’ and ‘how much is enough’ in analytics. When listening to presentations during the conference I was tempted to believe that the paradigm for fighting adulteration and fraud is in testing and analytics; this impression was laudably corrected by the speakers pointing the audience to testing and analytics as important and useful tools, when highlighting the systematic and structural approach as the necessary and most important.

Finally, before being round up by the Chair of the Conference Michele Suman (Barilla), the focus turned to the poster presentations that were displayed parallel to the conference. Three posters were presented with an award.

Find links to the conference below.
FoodIntegrity Project Results:

Knowledge Base (WP2), by Jean-Francois Morin

The aim of WP2 is to build a comprehensive Knowledge Base (KB) linking each food product and its potential fraud or integrity issues, to appropriate analytical strategies that can be used for food fraud detection or authenticity testing.

Up to now more than 300 methods have been put in the KB by experts of WP2 in relation to various food fraud issues (cf. Figure). A data quality check is ongoing for assuring harmonisation and relevance of data.

Furthermore, a beta-test involving more than 20 stakeholders, from control laboratories, food companies, professional associations and policy making bodies has been organised for getting feedback. A set of interesting comments have been collected and improvements of the IT tools are under development.

The question of the sustainability of the KB beyond the project has also been addressed. A transfer project of the KB to the JRC, expected early 2018, is under discussion. Freely accessible, the KB will be a knowledge reference in the field of food fraud. It will be used by food companies, in the case where they are facing an adulteration, for identifying analytical solutions for testing samples. It can also be used for preparing a control plan tailored to its needs and relevant for the food matrices or even for standardisation bodies to evaluate the status of validation of analytical methods efficient for a specific food fraud issue and select candidate method(s) for standardisation.

Including comprehensive and standardised metadata for the description of the method, the KB will act as a European focal point about analytical methods in the field of food fraud.

Misdescription incidents in European mass caterer (WP6), by Miguel Angel Pardo

The investigation into fish products has focused mainly on four countries: Iceland (main fish exporter); Norway (main farmed fish and fishing exporter); Spain (main importer of fish products in Europe and also a great exporter) and UK (one of the main importers of fish products in Europe).

AZTI technology centre, which specialises in methodologies to ensure the authenticity and origin of raw materials and ingredients, has led the work group, together with the Icelandic Matis Institute, to analyse adulteration and mislabelling on fish products.

The group analysed misdescription incidents in European restaurants. The survey was focused on HORECA sector (restaurants, hotels, catering, self-services, bar, pub, take away, etc.) all over Europe. AZTI and Matis have collected 282 samples from 179 restaurants in 23 European countries. The main objective of this survey is to elucidate the % of restaurants serving fish that does not fit which is detailed in the menu. This method combined with a citizen science approach will lead industry to self-regulation.

MAIN RESULTS

1. 52% (±7%) of restaurants served mislabelled fish in the menu.
2. The rate of mislabelling does not differ significantly between species except following cases:
   - 50% mislabelling of sole
   - 58% mislabelling of red tuna
   - 27% mislabelling of cod
3. The higher % of fish mislabelling was detected in caterings, canteens and take away restaurants.
4. 72% (±9%) of mislabelled fish samples were substituted with cheaper fish species with an economical motivation.
Chinese Consumer Study (WP7), by Lynn J. Frewer

The international group led by Prof Lynn Frewer from Newcastle University undertook the two-year study looking at Chinese consumer attitudes to European food products. The study involved 6 focus groups of Chinese consumers informing on the concerns held by Chinese consumers in relation to food safety and authenticity. The results were then used to compile a survey of 850 participants.

Our research indicates that Chinese consumers are increasingly concerned about food safety and Chinese media reports associated with food safety issues have increased over the last decade. Our research has identified Chinese consumer expectations, attitudes and preferences with regard to selected European products in terms of food authenticity, integrity and traceability.

Qualitative methodologies were initially used to explore Chinese consumer’s awareness of, and attitudes towards, food fraud. The results, together with insights from the literature, were used to develop a quantitative survey, which permitted hypotheses established in the focus group stage to be tested.

The influence of geographical location and product type on attitude and purchase intention were also explored. Three product categories, infant milk formula Scotch whisky, and olive oil presented different examples of potentially fraudulent products. Seven focus groups with more affluent consumers were held in Beijing, Guangzhou and Chengdu.

The results suggest that food fraud was associated with expressions of anxiety and concern relating to the safety of food available to the Chinese consumer in the domestic market, and was associated with a lack of trust in the motives of industry and the abilities of the authorities to protect the interests of consumers with regard to food safety, the latter being exacerbated by the complexity of the food chain.

The results were used to design a survey instrument, which was administered to 850 participants resident in the same cities. The results indicate that the more concerned consumers were about food safety, the stronger was their perception of the risks posed by adulterated food. Study participants were also more positive about the role that authenticity testing had in protecting consumers, and they expressed a higher level of intention to purchase authenticated food and drink products. Furthermore, Chinese consumers were unable to disassociate incidents of economically motivated adulteration from food safety risks that, by implication, present potential health hazards. While authenticity cues present reassurances about the authenticity of (European) products, it is important that manufacturers ensure packaging measures are updated in advance potentially fraudulent activities.

As well as research papers being submitted to journals, we have produced an information leaflet for industry stakeholders and other interested end-users.

**Dissemination activities:**

**New FoodIntegrity Publication:**
Barbara Prandi, Francesca Lambertini, Andrea Faccini, Michele Suman, Andrea Leporati, Tullia Tedeschi, Stefano Sforza: Mass spectrometry quantification of beef and pork meat in highly processed food: Application on Bolognese sauce, Food Control 74 (2017) 61-69.

**1st Scientific Opinion published:**

**Conferences:**

China International Food Safety & Quality Conference – Shanghai, China: November 2016

FOOD FRAUD - Global Understanding 2017 – Quebec City, Canada: April 2017
Media:

FoodIntegrity TV and Press coverage can be found by visiting the following page: http://foodintegrity2017-parma.eu/press/

Training activities:

For the efficient knowledge transfer of developed technologies and other information generated within the project framework, training network has been established, consisting of a comprehensive training program, a young scientist mobility program, establishing a training school, and the organisation of a series of workshops.

The training program will be launched soon. If you wish to be informed on opportunities offered by the training program, please register for the project COMMUNICATION here.

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Dates for diary:

FoodIntegrity Associated events:

8th International Symposium on Recent Advances in Food Analysis (RAFA 2017)
7-10 November 2017, Prague, Czech Republic

Belfast Summit on Global Food Integrity (ASSET 2018)
29-31 May 2018, Belfast, Northern Ireland, UK

External events:

EuroAnalysis
28 August-1 September 2017, Stockholm, Sweden

EUROFOODCHEM XIX
4-6 October 2017, Budapest, Hungary

5th MS Food Day – International Conference of Mass Spectrometry Applications in AgriFood Sector
11-13 October 2017, Bologna, Italy

China International Food Safety & Quality Conference
1-2 November 2017, Beijing, China

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Please contact us at foodintegrity@fera.co.uk with any suggestions for improvement.
Welcome to the Sixth FoodIntegrity Newsletter.

Very soon we will, unbelievably, be entering the last year of FoodIntegrity. The date and location for the 5th Annual FoodIntegrity Conference, which will coincide with the project’s completion, has just been set. Put the date in your diaries.

**5th FoodIntegrity Conference: 14th – 15th November, 2018 in Nantes, France**

It seems like an opportune time to report the opinions of some important stakeholders on FoodIntegrity’s progress. The team at the Scotch Whisky Research Institute have used my guest editorial capacity to identify benefits seen by our own industry in its participation within FoodIntegrity. We also gain valuable insights from Eric Marin of the EU’s Directorate General of Health and Food Safety and Simon Kelly of the United Nation’s FAO/IAEA Joint Division.

The objectives of FoodIntegrity are inherent in many related EU projects, some of which will continue its legacy past its official completion date. This newsletter focuses on three such projects: Authent-Net, OLEUM and EU-China-Safe.

And finally, the FoodIntegrity project continues to produce results of benefit to industry, official food control, and consumers world-wide. One of the first project deliverables was the prioritisation of gaps in the application of scientific methods to food authentication. FoodIntegrity has been unique in commissioning additional packages of work to address these priorities. This newsletter briefly reports on initial results from work on rapid, on-site, cost-effective methods for fraud detection within the Iberian Pig industry. Future newsletters will focus on the outcomes from some of the other commissioned work.

**Guest Editor, Ian Goodall – Scotch Whisky Research Institute**

And don’t forget, there are many ways by which you can still get involved with the project and keep up to date with news, events and activities. Don’t hesitate to visit our web site at [www.FoodIntegrity.eu](http://www.foodintegrity.eu) or sign up as an expert or stakeholder in the FoodIntegrity Network. Please contact us ([foodintegrity@fera.co.uk](mailto:foodintegrity@fera.co.uk)) with any suggestions for improvement.

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**Perspective of Industry on FoodIntegrity:**

**Meeting the needs of industrial partners**

**Ian Goodall, The Scotch Whisky Research Institute & Work Package 5 Leader**

The Scotch Whisky Research Institute (SWRI) is the Research and Technical Organisation for the UK distilling sector. One of its key roles is the application of its scientific understanding of Scotch Whisky production for the benefit of its industrial membership, from raw materials to final product. However, the Institute also serves to represent the spirit drink sector’s industrial needs within the wider research community.

This dual role has been to the fore in the SWRI’s participation within the FoodIntegrity project. We have researched and developed techniques and resources to improve the authentication of EU spirit drink products. However, we have also acted as a voice to promote the needs of our sector in identifying and preventing fraud. We have been able to use key opportunities that the FoodIntegrity project has provided to explain these requirements to a number of solution providers. Successful collaborations have resulted, making use of experts from within the FoodIntegrity consortium as well as those that have engaged with the project through its wide range of workshops, conferences and other dissemination activities.
In our experience, the needs of industry can often be overlooked when it comes to designing and enacting research projects in the areas of food authentication. Technology providers and researchers with a novel application will develop and publish scientific studies that address the wrong problems, or fail to understand the complexities of a seemingly simple production process. Promised advances in spirit drink authentication often fail to live up to expectations as result.

The FoodIntegrity project, whilst making good use of the scientific expertise embedded in academic and research institutions, has incorporated a strong foundation of contributions from within the food industry. This has helped ensure that solutions and resources developed are both innovative and relevant. The initial Work Packages were designed with the needs of industry in mind. The following initiatives have been of particular note:

- the incorporation of Work Packages to specifically address authentication challenges associated with three key commodities: olive oil, spirit drinks and fish;
- the inclusion of a Work Package led by a major European food manufacturer, Barilla, to help ensure that the project’s outcomes have sustainable impact for the food industry; and
- a study of Chinese consumer attitudes to the authenticity of European food products and the ways in which producers can provide quality assurances (with the added bonus of a focus on Scotch Whisky).

This said, I still think the industrial voice could be stronger within such large-scale collaborative projects as FoodIntegrity. There are always complications to achieving this objective, not least the highly competitive nature of the food industry and its resulting reluctance to share commercial information and publicise an area that can generate negative press. However, being able to demonstrate effectiveness in identifying and removing fraud throughout a food product’s supply chain is often vital to a sector’s sustainability and justifies industrial participation. The advances made in Scotch Whisky authentication from the collaborations established within FoodIntegrity will be a valuable legacy of the project.

**Perspective of DG Health and Food Safety on FoodIntegrity:**

**Progress of the FoodIntegrity project and links with other current and possible future EU food research perspectives**

**Eric Marin, DG Health and Safety & Member of the FoodIntegrity Advisory Board**

Recent food crises in the European Union have very clearly shown the need for such a project, the beginning of which predates the horsemeat crisis and therefore proved visionary and immediately demonstrated the increasing interest of European research in this field.

The participation of DG Health and Food Safety as a Board member in this vast project co-funded by DG Research (12 million Euros) has allowed the work to be steered towards the interests of the relevant authorities in this area and constitutes a concrete example of the use of the EU research budget for the Commission’s strategic priorities.

The areas of the project that have been of particular interest to DG Health and Food Safety include:

- the development of a stakeholder platform, which fits within the strategy of strengthening cooperation to prevent and combat fraud and allowed the creation of a link with the EU FOOD FRAUD NETWORK (EU Member States’ competent authorities);
- the knowledge database, a web tool that compiles available information on suitable analytical tools and associated reference data for the detection of food fraud;
- the identification of research gaps, i.e. in the field of analytical methodology;
- the early warning system, which will be of huge interest to the competent authorities and businesses.

As regards the identification of gaps, I would like to point out that research organisations tend to focus on advanced technologies. The regular updating and maintenance of these databases is costly. For the time being, it has proved difficult to use these results as irrefutable evidence in judicial proceedings. I believe that we also lack harmonised methods in certain sensitive sectors that are prone to fraud. We need to develop these further. An issue as simple as adding water or applying glazing to foods merits greater attention from the reference laboratories, to agree on harmonised methods for one of the most, if not the most common, types of food fraud.

One of the future challenges of the European Commission is the establishment of European Reference Centres for Food Authenticity as provided for in the new Official Controls Regulation which entered into force on 27 April 2017. No provision has been made in the 2018 budget to undertake the work needed for their establishment. However, in the meantime, the Commission’s Joint Research Centre has proposed to set up a European Commission Knowledge Centre for Food Fraud. This will collect, check, structure and make easily accessible and comparable all the relevant data, knowledge and intelligence related to food fraud, making it readily available to Commission services regulating the food supply chain. I am confident that this platform will work as a good transitional tool for the projects of interest to the stakeholders by guaranteeing the durability of the concrete results obtained by the FoodIntegrity project.
Perspective of the FAO on FoodIntegrity:

Fresh eyes on the FoodIntegrity project

Simon Kelly, Joint FAO/IAEA Division of Nuclear Applications in Food and Agriculture & WP1 Leader

I was involved in the conceptualisation of the FoodIntegrity project whilst working at Fera and was fortunate to have a really strong team of core institutes collaborating on the submission, which led to the project being successfully funded in 2013. I left Fera in October 2013 but returned to the FI project in 2016 as a participant through the United Nation’s FAO/IAEA Joint Division in Work Packages 1, 2, 10 and 11 and more recently as the WP1 leader.

What’s really pleasing and satisfying is to see that all of the key planned activities have come to fruition. For example, the WP on gap analysis; recognising the wealth of existing information, has fed into the commissioning of €3M of highly relevant food integrity projects. These new projects have both enhanced and expanded the existing consortium. In addition, the FoodIntegrity knowledge base is in place and will be transferred to the European DG JRC Fraud Prevention and Detection Unit. This will ensure its long-term sustainability, an outcome that is often criticised as being overlooked in EU projects.

The success of the FI project can also be measured through the growing attendance at its annual conference and its activities to raise awareness of food adulteration, fraud and related safety issues outside the European Union. However, I believe FI has some way to go on raising awareness at an international level and consequently has yet to reach its full potential. Raising awareness of food fraud and adulteration fits well with the FAO, which is currently commissioning a study on food fraud in developing countries. This study is part of a series that seeks to explore the issue of food fraud and economically motivated adulteration in a number of FAO Member States. These investigations will characterise the scope and nature of the problem, the approaches to prevention and mitigation that countries have taken, major challenges and lessons learned. Ultimately the studies are intended to inform the global discussion on food fraud and to guide the FAO and member countries to recognise and address the challenges faced in tackling fraud.

With the outputs from the existing and new Workpackages, I see the FI project going from strength to strength. As the new WP1 leader, I plan to maintain this momentum with a series of promotional videos corresponding to the publishing of seven scientific opinions and various other activities, such as developing a range of food matrix reference materials dedicated to stable isotope analysis. We are also planning two one-day awareness raising workshops that will coincide with an IAEA Technical Cooperation conference in Africa and a food safety symposium in South America organised by the University of Cordoba. If you have any ideas for outreach activities, or would like to support these workshops, please get in touch.

FoodIntegrity ... Related Projects

Authent-Net – Strategic co-operation between Member State funding bodies to prevent food fraud

The profile of food fraud has never been higher than at the present time in Europe. With diminishing government budgets, there is a clear need for better cohesion and cooperation between funding bodies in Member States in order to work more strategically together and reduce duplication. Authent-Net is a 2-year H2020 Concerted Action that aims to fulfil that need.

From its start in April 2016, Authent-Net has been engaging with and “recruiting” funding bodies across Europe. Stock taking of research and surveillance activities, the funding landscape, mechanisms and priorities across 13 Member States has taken place. This information is currently being uploaded into a dynamic and sustainable European information platform, named the Food Authenticity Research Network Hub (FARNHub). This web-based portal, which will soon be accessible to all, provides users with a single interface related to most aspects of food authenticity, including papers and documents (scientific or other), ongoing projects, online databases, an overview of funding bodies with contact points, news stories, analytical methods and regulations.

A CEN Workshop Agreement (CWA) is also being developed that will propose terms and definitions for use in the area of food authenticity. The kick-off workshop for this work titled, “Authenticity in the Feed and Food Chain”, was held in May 2017 in Parma, Italy.

All of the work within this Concerted Action is continuously reviewed by the funding organisations within the project as well as the funder network members that have participated in several international workshops in Dublin, Geel and Parma. The final output of Authent-Net will be a written Strategic Research Agenda agreed by the funders, outlining high level priorities and ways of working together in the future. A white paper will be written providing the rationale for an ERA-NET in the area of food authenticity.

For further information on Authent-Net and how to join, please visit the Authent-Net website at: www.authent-net.eu.
OLEUM - Better solutions to protect olive oil quality and authenticity

Europe is currently the largest producer of olive oil, accounting for more than 70% of the world’s production. Non-EU countries are now starting to expand their domestic production, thereby increasing the competitiveness of the global olive oil market. This increased competitiveness, combined with expanding markets and a lack of efficient and harmonised analytical methods for detecting olive oil fraud, has led to significant weaknesses that can be exploited by counterfeiters.

OLEUM is a 4-year H2020 project coordinated by Prof. Tullia Gallina Toschi of the Department of Agricultural and Food Sciences of the University of Bologna, Italy. Twenty partners, covering fifteen countries, bring together competences from food analysis, food legislation, industrial equipment engineering, bioinformatics, communication and knowledge exchange. The overall objective of OLEUM is to better guarantee olive oil quality and authenticity by empowering detection and fostering prevention of olive oil fraud. Improvements in the quality, safety and authenticity of olive oils will boost consumer confidence and ultimately enhance the competitiveness of the EU olive oil market.

Designing the OLEUM Network

One of the strategic objectives of OLEUM is to develop and support a worldwide community of proficient analytical laboratories involved in the analysis of olive oil, therefore establishing a wide OLEUM Network.

Please contact us at OLEUM@fera.co.uk, if you are interested in joining.

Your opportunity to contribute to the OLEUM research activities

The OLEUM project has developed a questionnaire to identify information about current weaknesses in the olive oil regulations and analytical methods and to gather information about emerging frauds. To reach these goals, we need to collect information and opinions from many stakeholders involved in the olive oil sector. If you are interested and involved in the olive oil sector, please find the questionnaire here. The questionnaire will take only about 5 minutes, is available in several languages.

EU-China-Safe - Queen’s University Belfast to lead EU-China collaboration to tackle food fraud

The Institute for Global Food Security at Queen’s University Belfast will lead one of the world’s largest food safety projects across Europe and China. The European Horizon 2020 programme and Chinese Ministry of Science and Technology (MOST) programme have awarded €10 million towards an EU-China partnership to improve food safety and tackle food fraud.

The EU-China-Safe project will involve key players in the food industry, research organisations and Governments across two of the world’s largest trading areas.

Over recent years, China has become the EU’s biggest source of imports and second most important export market. In Europe and China, consumer trust in the food industry and regulatory authorities has been damaged by a large number of accidental and deliberate food contamination/adulteration incidents. The ability of European Union (EU) companies to export to, and import from China, has been hampered by these safety, traceability, regulatory and fraud issues. Chinese companies trying to export to Europe face similar obstacles.

Twenty-first century food supply chains are increasingly complex and highly vulnerable to safety and fraud threats. Increasing demand and growing markets enhance the likelihood of food safety incidents and deliberate contamination, which in turn ruin consumer trust and undermine legitimate trade at domestic and international levels. Several instances of food fraud and contamination have focused attention on product integrity, such as the 2008 Chinese melamine incident, the 2013 European horsemeat scandal and the 2014 ‘gutter oil’ scandal in China which saw slaughterhouse waste and sewage used in cooking oil.
Furthermore, laboratories in Europe and China are often working to different quality standards and using different analytical methods for producing data for certification/confirmation purposes, which can result in protracted trade disputes/embargoes.

There is a clear need for greater co-operation among those key actors within the EU and China, who are responsible for ensuring food safety, and preventing fraud, to accelerate the achievement of “mutual recognition” in food standards, testing and certification, similar to that already achieved in other areas between these trading blocks.

EU-China-Safe will reduce food fraud and improve food safety through focusing on improving food legislation, food inspection and increasing access to information across both continents. State-of-the-art technologies including a virtual laboratory will create a unique space to share and demonstrate best practice. The use of innovative technologies will result in improved detection of adulteration of food products as well as increased traceability and transparency of global supply chains.

Professor Elliott, Pro-Vice Chancellor, Faculty of Medicine, Health & Life Sciences at Queen’s and project co-ordinator, said:

“We are delighted that The Institute for Global Food Security at Queen’s University will lead this important project, bringing together key stakeholders in the global food system across two of the world’s largest trading markets.”

Professor Yongning Wu, Chief Scientist from the China National Center for Food Safety Risk Assessment, co-ordinator of the Chinese efforts in the project, stated:

“The EU-China Safe partnership between our two trading regions is of immense importance to help deliver safe and genuine food to all citizens. Working together across China and the EU will enable us to identify where food fraud is happening, address the root causes and thereby enable us to improve food safety standards for all our citizens.”

Reported instances of food fraud are on the increase and occur on a global scale, worth an estimated $52 billion globally each year. Food fraud is a global issue demanding a global response. The increasingly complex global food supply network increases the risks of serious food borne illness.

Professor Elliott added: “This project will tackle these highly connected issues in a way that will serve to better protect several billion people. There is a pressing need to act internationally in response to emerging threats to food safety and fraud. Working together as a coalition of 33 partners to share knowledge and maximise our technologies will empower the food industry to provide safer, authentic food and will boost consumers’ confidence and ultimately facilitate the expansion of EU-China trade.”

FoodIntegrity Priorities – Rapid Detection Methods

Work Package 19 - Rapid fraud detection within the Iberian pig sector

Work Package 19 was developed to meet the identified FoodIntegrity priority of “Rapid, on-site, cost-effective methods for feed/food fraud detection.” Its objective is to design a system of “voluntary labelling” based on Near Infrared Spectroscopy (NIRS) in combination with information and communication technologies (ICTs) to be used in the Iberian Pig industry sector. Work Package 21 will engage in demonstration activities for the outcomes of Work Package 19, as well as Work Package 15 (dedicated to the identification of fish species from its digitised picture).

As a first step, a number of tests have been carried out at both laboratory and slaughterhouse to optimize different parameters, including spectral range and resolution. The sampling technique has also been refined to produce a list of recommendations that can be observed when taking measurements at the slaughterhouse. It was found that reducing noise and increasing signal-to-noise are essential steps needed to detect the smallest concentration levels of an analyte of interest.

Secondly, the most common inter-instrument standardisation methods were tested using spectra belonging to different instruments: an NIRS scanning monochromator instrument (FNS6500) and a MicroNIR (MN1700) miniature spectrometer. 267 samples of adipose tissue belonging to carcasses
from the category “Premium” and 392 samples belonging to the category “Non-Premium” were transferred from the FNS6500 to the MN1700. 56 samples analysed with the MN1700 were used as validation set. Results obtained showed that accuracy and precision of the prediction models for palmitic, stearic and oleic acids maintain acceptable values.

Once the feasibility of transferring a large dataset of intact pig adipose tissue had been demonstrated, 500 samples were analysed at different slaughterhouses in the Pedroche Valley and Guijuelo Province, both covered by the Jamon Pata Negra Designation of Origin. New prediction models are being developed to determine the fatty acid profile and therefore the commercial category of each animal, focussing on detecting the Premium category that is related to animals fed with acorns.

Dissemination activities:

Budapest Workshop:
A workshop on assuring the integrity of the food supply in the Central European countries was organised on the 25th October 2017 in Budapest, Hungary. The aim of this workshop was to foster collaboration between EU countries and Hungarian food safety authorities and research organisations. Recent knowledge on practices to counter food fraud was communicated and networking opportunities for future collaboration were discussed.

RAFA 2017:
The 2nd FoodIntegrity Open day is a satellite event of the 8th International Symposium on Recent Advances in Food Analysis (RAFA 2017), on 7-10 November 2017, Prague, Czech Republic. The Open day offers RAFA delegates the chance to join the FoodIntegrity experts to discuss the latest developments and strategies in the field of food integrity.

For further information on dissemination activities please click HERE.

Training Activities:

TRAINING PROGRAMME OPEN CALL
FoodIntegrity has now opened the call for participation in one of the numerous training programmes offered by expert institutes around Europe.

A training network has been established, consisting of a comprehensive training program, a young scientist mobility program, establishing a training school, and the organisation of a series of workshops. Number of trainings will be provided by well-established EU organisations for:

ANALYTICAL METHODOLOGIES CONCEPTS: (i) Stable isotopes and metabolomics for verifying authenticity of food; (ii) IRMS – Theory and lab fruit juice and wine; (iii) Stable isotope analysis of wine; (iv) Vibrational spectroscopy and chemometrics; (v) FT-IR spectroscopy for authentication of food; (vi) Application of advanced validated analytical strategies for food / feed authentication; (vii) Analytical tools for authenticity of raw materials in pasta, sauces & bakery production

COMMODITIES CONCEPTS: (i) Workshop on Infrared spectroscopy, Raman spectroscopy and chemometrics for monitoring of food and feed products; (ii) Training on Profiling with applications to honey

OTHER CONCEPTS: (i) Regulatory & Risk Assessment (Frauds & adulterations management in strategic raw materials for pasta, sauces & bakery products); (ii) Sensory & Management (Consumers science & Industrial management skills useful to assure food integrity); (iii) Data collection and analysis methods in consumer research; (iv) Traceability in relation to food integrity

Please follow this link for further information: List of Training Opportunities and Institutes

Please follow this link to access the application: Training Application Form

Application Deadline: 30 November 2017

All applications and CVs to be sent to: Monika.Tomaniova@vscht.cz
How to Get Involved?

- Register for project communications.
- Please click here to register to be a part of the FoodIntegrity Network.
- Follow FoodIntegrity on Twitter or join the Network Group on LinkedIn.

Dates for Diary:

FoodIntegrity Associated events:

- **Belfast Summit on Global Food Integrity (ASSET 2018)**
  29-31 May 2018, Belfast, Northern Ireland, UK

External events:

- **3rd International Conference on Global Food Security**
  3-6 December 2017, Cape Town, South Africa
- **5th International Conference on Foodomics**
  10-12 January 2018, Cesena, Italy
- **15th International Symposium on Hyphenated Techniques in Chromatography and Separation Technology**
  24-26 January 2018, Cardiff, UK
- **Nutraceuticals Europe**
  14-15 February 2018, Barcelona, Spain
- **Prevent Food Fraud & Ensure Product Integrity & Compliance**
  22 February 2018, London, UK
- **FoodFraud**
  1 March 2018, London, UK
- **10th World Mycotoxin Forum**
  12-14 March 2018, Amsterdam, The Netherlands
- **14th Annual North America Summit on Food Safety**
  30 April – 1 May 2018, Toronto, Canada
- **3rd Food Structure and Functionality Forum Symposium and 3rd IDF Symposium on Microstructure of Dairy Products**
  3-6 June 2018, Montreal, Canada
- **Metabolomics 2018**
  25-28 June 2018, Seattle, USA
- **Innovations in Food Analysis**
  19-21 September 2018, Munich, Germany
- **32nd International Symposium on Chromatography (ISC 2018)**
  23-27 September 2018, Cannes - Mandelieu, France

We hope you have found this e-Newsletter interesting and informative. We would welcome your views on any of the issues covered. Please email foodintegrity@fera.co.uk. Please feel free to distribute this FoodIntegrity e-Newsletter to other interested parties.

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Please contact us at foodintegrity@fera.co.uk with any suggestions for improvement.
Welcome to the Seventh FoodIntegrity and penultimate Newsletter. As this project comes to its final few months, the outcomes and legacy of this 5-year 60 partner project have established a solid basis for providing assurance to consumers and other stakeholders about the safety, authenticity and quality of our food.

The final conference, taking place in Nantes on 14-15 November will showcase the latest research and state of the art solutions for tackling food fraud. This multidisciplinary conference comprises 15 sessions with over 60 speakers on a range of topics including: non-targeted analysis, the impact of trade wars, debates on who is the real victim of food fraud, the latest hand held devices for authentication, sessions on future research priorities. Something for everyone.

One of the acknowledged successes of FoodIntegrity has been its ability to act as a global forum to meet and discuss food integrity issues. In addition to the international audience that will attend Nantes, the project has travelled the globe contributing to key conferences in the Americas, Africa, China and Singapore. We hope to have news soon on how we can continue to spread the FoodIntegrity message in the future.

Finally, special thanks to our advisory board, who will be meeting for the last time in Nantes, for their contributions the last 5 years of the project.

Guest Editor, Professor Paul Brereton - Queen’s University Belfast

And don’t forget, there are many ways by which you can still get involved with the project and keep up to date with news, events and activities. Don’t hesitate to visit our web site at www.FoodIntegrity.eu or sign up as an expert or stakeholder in the FoodIntegrity Network. Please contact us (foodintegrity@fera.co.uk) with any suggestions for improvement.

FoodIntegrity Around the World:

**Belfast, Northern Ireland**

*Chris Elliott, Chair of the ASSET organising committee, Queen’s University Belfast*

The inaugural Belfast Summit on Global Food Integrity took place on 28-31 May at the Waterfront Hall and attracted over 600 delegates from 47 countries over four days. The Summit was a great success, with a lively line-up of plenary and keynote speakers, workshops, EU project meetings, (including two scientific session of FoodIntegrity), entertainment from Television scientist Marty Jopson and a range of spinoff events. Speakers from the United Nations, Pepsico, World Wildlife Fund and leading research centres throughout the world gave us thought-provoking insights: such as like how AMR is likely to be a bigger public-health threat than cancer by 2050; that 96% of all mammals left in the world are farmed animals with the remaining 4% of wildlife squeezed into smaller and smaller areas of forest, and how it’s all connected. Biodiversity (or lack of), climate change, geopolitics, pollution, terrorism, Brexit, agriculture, all have a direct impact on our global food supply system.
A central message to come out of the Summit is that there’s still time to turn things around with some creativity, focus and action, but the action is needed now. To that end, the next step is to funnel the outcomes of the Summit into clear recommendations and then feed these back into the regulatory organisations which participated in the Summit so policy can be influenced at the highest levels.

**FoodIntegrity Around the World:**

**Pretoria, South Africa**

*Simon Kelly, Joint FAO/IAEA Division of Nuclear Applications in Food and Agriculture - WP Leader FoodIntegrity Network*

The National Metrology Institute of South Africa along with their partners, hosted the Africa Food Safety Workshop in Pretoria, South Africa from 4-8 June 2018. The workshop aimed to contribute to the improvement of food safety control systems in Africa by combining talks on topics including food safety and authenticity, mycotoxins, veterinary drug and pesticide residues and food microbiology. The workshop attracted 238 delegates from 54 countries, from Africa, Asia, Canada, Europe, Latin America and United States of America.

The Food Integrity Session covered:

- the Industrial Perspective on effective available solutions to detect food fraud.
- The authenticity and safety of spirit drinks.
- Food Fraud Early Warning Systems.
- Stable isotope methods in food authenticity and traceability.
- Situation analysis of food fraud, food crime and economically motivated adulteration of food in Uganda.
- Authenticity and safety in the fruit juice industry through industrial self-control.
- Multi-spectrum method for the determination of food authenticity in China

Session Wrap up and discussions were facilitated by Paul Brereton.
**Edinburgh, Scotland**

*Ian Goodall, SWRI – WP Leader Spirit Drinks*

In June 2018, the Scotch Whisky Research Institute (SWRI) ran a FoodIntegrity Spirit Drinks Authenticity Workshop to help shape the future direction of anti-counterfeiting and authenticity research for the sector. The FoodIntegrity project has advanced the sector’s ability to detect counterfeit products. This has come not only through improvements in technology and analytical capability, but also by building networks of spirit drinks producers, analysts, technology providers, regulators and enforcement agencies. The purpose of this workshop was to bring together these stakeholders to discuss and influence the future direction of SWRI and EU research on spirit drinks authentication. As well as presentations from SWRI scientists on the work carried out during the project, there were also talks from experts including:

- Nick Soper, Internal Market Director at spiritsEUROPE
- Paul Brereton, Director of Strategic Alliances at the Institute for Global Food Security
- Bryan McCullough, Senior Researcher from the National Measurement Laboratory
- Dr David Ellis, Senior Experimental Officer at the Manchester Institute of Biotechnology
- Michal Stupak, who has just completed a PhD at the University of Chemistry and Technology in Prague, part of which focussed on Scotch Whisky authenticity analysis

Brainstorming exercises in multidisciplinary groups identified remaining challenges, potential solutions and priorities for future research and development. One of the main themes that came out of the discussions was the need for ongoing collaboration and communication. There was also consensus that rapid, portable, ‘through-bottle’ analysis is the holy grail in spirit drinks authenticity testing. Challenges identified included how we deal with the large data sets generated by high-resolution analysis and how we can bridge the gap between the development of solutions by technology providers and the industry’s commitment to invest in them.

In addition to the main workshop, the SWRI also held a smaller session the previous day, where attendees had the opportunity to learn about SWRI’s authenticity research and analytical capabilities.

Over 40 people attended the workshop, hailing from different organisations across Europe. Spirit drinks producers, government laboratories, technology companies, regulators, enforcement agencies and trade bodies were represented, including BNIC’s Station Viticole, the SWRI’s equivalent research institute for Cognac.

Presentations from the workshop, and all other outputs and resources from FoodIntegrity project, are available on the FoodIntegrity website. If you would like access, please contact Ian Goodall.

**FoodIntegrity Around the World:**

**Cordoba, Argentina**

*Paul Brereton, QUB – FoodIntegrity Science Coordinator*

The Seventh International Congress of Food Science and Technology (VII CICYTAC) aimed to promote a discussion, exchange experiences and update participants on new scientific and technological advances in the area of foods at national, regional and international levels.

Over 600 participants attended the congress in Cordoba, Argentina. FoodIntegrity speakers: Paul Brereton (QUB), Saskia van Ruth (Wageningen/Rikilt), Joachim Kopka (Max Planck), Daniel Wunderlin and Verónica Baroni (CONICET) presented the results of the latest research and solutions for addressing food fraud.
Riyadh, Kingdom of Saudi Arabia

James Donarski, FERA Science Ltd, Project Coordinator

The Saudi Food and Drug Authority hosted the SFDA Annual Conference and Exhibition in Riyadh, from the 25th to the 27th of September 2018. This conference serves as an annual gathering that connects SFDA with other stakeholders from private and public sectors. Invited FoodIntegrity speakers, Dr James Donarski (Fera) and Dr Francis Butler (UCD), presented the latest research in Early Warning Systems in the section entitled “Time to define Food Integrity”.

More information on the conference and exhibition can be found HERE.

FoodIntegrity Scientific Opinions

The FoodIntegrity project has produced a set of 8 scientific opinions on topics chosen by the stakeholders themselves. These papers address key technical issues that stakeholders have identified as problematic, e.g. the future of new technologies such as Next Generation Sequencing, Best practice for producing databases, the role of non targeted analysis. Several of the opinions have already been published in Trends in Food Science and Technology.

All of the FoodIntegrity published papers along with the Scientific Opinions can be found by clicking HERE.

The FoodIntegrity Scientific opinions will also soon be accompanied by Info-Graphic videos available on the FI YouTube Channel.

FoodIntegrity Training Outcomes

FoodIntegrity Training

Monika Tomaniova, VSCHT, Technology transfer

The task of technology transfer of FoodIntegrity outputs and knowledge to stakeholders is a major task and has been achieved through a number of activities and approaches: a comprehensive training program, a young scientist mobility program, the establishment of a Food Integrity training school, and the organisation of a series of workshops.

Various short-term and long-term training and education activities at different levels have taken place within the FoodIntegrity project training program and facilitated exchange of expertise among the participants within and outside the project consortium and supported both staff and young scientists in development of their careers. To ensure sustainability of the training program, (i) ‘train the trainer’ approach has been applied and (ii) training materials prepared by trainers’ centres will be accessible to the public.

95 applications for participation in the FoodIntegrity training programme coming from 24 countries of EU, Asia, Australia and Oceania, and South America have been received; 55 applicants have been selected and successfully completed trainings during 2018 in the training concepts they have applied for. Training program has been delivered in cooperation with well-established EU organisations in 13 short-term training activities:
Vibrational spectroscopy and chemometrics (CRA-W, Gembloux, Belgium)

FT-IR spectroscopy for authentication of food (BfR, Berlin, Germany)

Stable isotope analysis of wine (BfR, Berlin, Germany)

IRMS – Theory and lab fruit juice and wine (Fera Science Ltd, York, UK)

Profiling with applications to honey (Fera Science Ltd, York, UK)

Foodomics: Untargeted Analysis of Foods (QUB, Belfast, UK)

Metabolomic fingerprinting / profiling based on high resolution mass spectrometry for food, nutraceuticals & feed authentication (UCT Prague, Prague, Czech Republic)

Metabolomics for verifying authenticity of food (IAEA/FAO, Vienna, Austria)

Stable isotopes for verifying authenticity of food (IAEA/FAO, Vienna, Austria)

Analytical tools for authenticity of raw materials in pasta, sauces & bakery production (Barilla, Parma, Italy)

‘REGULATORY & RISK ASSESSMENT CONCEPT’ Frauds & adulterations management in strategic raw materials for pasta, sauces & bakery products & ‘SENSORY & MANAGEMENT CONCEPTS’ Consumers science & Industrial management skills useful to assure food integrity (Barilla, Parma, Italy)

Data collection and analysis methods in consumer research (FiBL, Frick, Switzerland)

Traceability in relation to food integrity (Nofima, Tromsoe, Norway)

(ii) and 4 scientists´ mobility activities:

Vibrational spectroscopic methods applied on cereals (CRA-W, Gembloux, Belgium)

Rapid tools for food integrity: testing on the field (Barilla, Parma, Italy)

The power of tandem high-resolution mass spectrometry in food, natural products and feed authentication (UCT Prague, Prague, Czech Republic)

Food fraud vulnerability assessments (RIKILT Wageningen UR, Wageningen, The Netherlands)

In addition, FoodIntegrity training week consisting of ‘Training school on assuring the integrity in the food chain’ and ‘Symposium for post-graduate students on food fraud’ has been organised in September 2018 for more than 30 participants; more details including program of the event and abstracts of all presentations can be found here.

In November 2018, two training workshops will be organised, on (i) The role of modern analytical approaches in fighting with food fraud (as satellite event of the FoodIntegrity 2018 conference, more details here), and (ii) Integrity management along commodity supply chains (more details here).
THANK YOU

A big thank you to all of our advisory board members that have supported and advised this project from 2013 to 2018.

Penny Bramwell  Andrew Damant  Sue Davies  Lucy Foster

Barbara Gallini  Carmen Guaru  Beate Kettlitz  Michèle Lees

James Lindsay  Shefalee Loth  Eric Marin  Leonardo Mirone

Jeff Moore  John Spink  Peter Whelan
How to Get Involved?

 güamba: Register for project communications.
 güamba: Please click here to register to be a part of the FoodIntegrity Network.
 güamba: Follow FoodIntegrity on Twitter or join the Network Group on LinkedIn.

Dates for Diary:

FoodIntegrity Associated events:

**Food Fraud Conference**
28 February 2019, London, UK

External events:

**Rapid Methods Europe (RME2018)**
5-7 November 2018, Amsterdam, the Netherlands

**Food Safety Analysis 2018**
27-28 November 2018, Singapore

**XX. EUROFOODCHEM**
17-19 June 2019, Porto, Portugal

**11th World Mycotoxin Forum**
14-16 October 2019, Belfast, UK

**9th International Symposium on Recent Advances in Food Analysis (RAFA 2019)**
5-9 November 2019, Prague, Czech Republic

We hope you have found this e-Newsletter interesting and informative. We would welcome your views on any of the issues covered. Please email foodintegrity@fera.co.uk. Please feel free to distribute this FoodIntegrity e-Newsletter to other interested parties.

**Disclaimer:** The information expressed in this e-Newsletter reflects the authors’ views; the European Commission is not liable for the information contained therein. The FoodIntegrity consortium cannot accept any liability for the e-Newsletter accuracy or content.

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www.foodintegrity.eu
Welcome to the eighth FoodIntegrity Newsletter, a conference special edition. The 5th FoodIntegrity conference, Assuring the integrity of the food chain, Delivering real world solutions, took place in Nantes on 14-15 November and showcased the latest research and state of the art solutions for tackling food fraud. With ~300 attendees from over 40 countries, this multidisciplinary conference provided the participants with 57 presentations, 70 posters, a demo corner, 2 workshops and 1 debate. Looking at diverging techniques from blockchain to non targeted analysis, gene editing to international trade there was something for everyone during the 1.5 day conference. The event was also the perfect setting to launch a free handbook of analytical methods HANDBOOK.

Many thanks to hosts Eurofins and their conference team for an excellently organised conference and special thanks to their lead Jean-Francois Morin for the smooth running of the excellent event and for looking so calm throughout! You can find lots more information about the conference at www.foodintegrity2018-nantes.eu.

Although FoodIntegrity, the project comes to a close soon, the conferences have been such a success that we hope to shortly announce FoodIntegrity 2020 in conjunction with a partner - watch this space!

Hope you enjoy the Newsletter and best wishes for the festive season.

Guest Editor, Professor Paul Brereton - Queen’s University Belfast

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**Strategic Look from the Big Players and Hot Topics Session**

**Verda Fazlic – Fera Science Ltd.**

The 2018 FoodIntegrity conference commenced with two plenary sessions looking at the perspective of key stakeholders as well as introducing key areas of importance for the future.

Peter Whelan (Food Safety Authority of Ireland), spoke of the investigations of food fraud that lead to court cases and of the complications that sometimes arise. Thousands of Euros spent on investigations for a few hundred Euros fine, the invisible players in the food industry with the most opportunities to commit crimes and the need for science to be consistent, as the lawyers will always attack any weaknesses in the process.

Elke Anklam of the JRC talked about their role in countering food fraud and briefed the audience on the EC Knowledge Centre on Food Fraud & Food Quality that they host.

After the break we commenced with a presentation from Antoine Kastler, the president of the European Flavour Association on the strategy of the flavour industry on vanilla and vanilla extracts. He gave an overview on the state of the world’s favourite flavour, and the challenges faced due to the fact that 80% of the beans come from one island, Madagascar. The other complexities that lie in the interpretation of the“natural vanilla flavour” labels and the industry’s commitment to secure sustainable sourcing of the beans, when resources are strained.
Clare Menezes offered the McCormick perspective on the herb and spice trade and its challenges, while also offering ways that the organisation have worked towards protecting the integrity of their supply chains and how use short supply chains in order to ensure authenticity of their products.

Michael Haverty of Andersons Centre discussed trade barriers and global agri-food trade, with soya bean as an example. He highlighted that trade barriers that can open gaps and provide motivations for fraud to occur and referenced Brexit and its potential impact on trade.

Finally, the complex topic of new breeding techniques, their regulation and analytical challenges was described by Mathieu Rolland of Anses, Plant health Laboratory. Mathieu managed to keep the audience’s attention by explaining such a complex process of genome editing with such ease and simplicity, that even the non-scientists in the audience were fascinated.

From Left: Paul Brereton (QUB), Elke Anklam (JRC), Razvan Anistoroaei (DG Research), Peter Whelan (FSAI), some of the key speakers in the plenary sessions

FoodIntegrity Conference – Nantes 2018

Complex foods: tools for food authenticity assessment
Michele Suman – Barilla Group (Work Package 10 Lead)

The topic of complex foods and how to deal with them through tools for food authenticity assessment was surely one of the main arguments within FoodIntegrity project and final conference as well.

Three lessons learned in this sense are:

1. Proteomics strategies have emerged recently as novel and powerful tools to address different aspects of food authenticity (e.g. differentiate mozzarella from cow and buffalo, differentiate tomato varieties,
identify animal species in processed meat, etc...): the identification and evaluation of specific marker peptides is key for the subsequent development of targeted mass spectrometry-based detection methods.

- 2. High-resolution 'H-NMR spectroscopy and Mass Spectrometry, combined with multivariate statistical chemometrics, provide unique capabilities for food authenticity control, yielding targeted quantification of selected compounds as well as untargeted fingerprinting.

- 3. Multi-disciplinary approaches are growing in order to identify and trace reliable markers (chemical and DNA-based) for: (i) authenticating specific added-value products such as for instance Manuka honey, (ii) constructing a tool-kit from different methods to verify integrity/stability from raw to processed complex foods such as multi-functional-ingredient biscuits.

FoodIntegrity Conference – Nantes 2018

The lab comes to the factory
Diego Luis García Gonzalez – CSIC Insituto de la Grasa (Work Package 4 Lead)

The speakers of this session dealt with the latest advances in the innovative methods for the analysis of foods with authentication or control purposes. Dr. Acutis presented a mobile app called F.I.S.HUB to verify fish species. The software associated with this app is able to identify the species of a fish from its picture by means of a photo database and a machine-learning server for image analysis and classification. The app is now ready to be downloaded and it is available on iTunes. At this time, there are 26 species identifiable in the database. Dr. Goodall explained the place of portable technologies based on UV-Vis, NIR and Raman spectroscopies, pH and conductivity analysis pens, and handheld density meters in detecting spirit drinks fraud. In the line of portable instruments, Dr. Weesepoel explained the objectives and first results of PhasmaFOOD project. This project aims at delivering a miniaturized multi-sensor optical sensing device for the detection of food safety threats (food spoilage, food fraud and aflatoxins). The system is based on heterogeneous fluorescence, visible and near infrared spectroscopy technologies. Finally, Dr. Garrido-Varo described the on-site analysis of individual pork carcasses for the predictions of quality parameters in Iberian ham by using NIRS portable devices. In particular, these devices were used for on-site quantitative (fatty acid profile) and qualitative (Premium, Non-premium) analysis of individual Iberian pork carcasses at the slaughterhouse.
**Transparency and trust in the food chain**
*Shefalee Loth - WHICH? Principal Food Investigator/Writer*

We had an interesting session on the afternoon of the first day of the conference titled 'Transparency and trust in the food chain'. Firstly Neils Lucas Luijckx (TNO, Netherlands) presented on how data sharing can be a solution to identify food issues early, followed by Gerald A. Herrmann (Organic Services, Germany) who presented on how in the case of organic fraud, production volumes can be compared with trade volumes to detect fraud. Organic Services has created a cloud-based audit tool which can track movement of goods along the supply chain to ensure integrity.

This was followed by Fiens Minnens (Ghent University, Belgium) who talked to the attendees about stakeholder concerns and what's needed for information sharing systems to be successful, and Carla Alegría (CFiencias.ID) describing the methodologies the group is using to authenticate high value foods from the Mediterranean such as the Black Iberian pig. There was an interesting discussion about how the Organic Services and REALMed approaches could be extended to other food and drink products and what we need to do going forward to encourage stakeholders to share information and intelligence openly.

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**Standardisation: new initiatives**
*Paul Brereton – QUB (FI Scientific Coordinator)*

Petter Olsen (Nofima) gave an overview to the packed room on the CEN workshop agreement that has produced a standardised definition of terms. The Agreement provides a very systematic approach with clear definitions and a hierarchy of terms. Diana Banati and Bert Popping (ILSI) provided an overview of the work ILSI are intending to do in this area which included mapping out all the relevant ongoing activities at a global level. Bruno Sechet (IFS) explained the role that food safety play in the food fraud arena. Finally Joanne Carter (on behalf of IFAAO) gave a transatlantic view and demonstrated that there is still a lot of work to do globally to harmonise in this area.

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**Molecular biology approaches to food integrity**
*Elena Maestri - SITEIA Parma*

On Wednesday 14th November, the Parallel Session 7 “Molecular biology approaches to food integrity” was chaired by Elena Maestri and Thomas Charrier, with Claire Sykes as support.

Five speakers presented the results of their work on novel approaches based on Next Generation Sequencing, metabarcoding and techniques for DNA analysis. It was a welcome occasion, after 5 years of FOODINTEGRITY, to hear about this aspect of food integrity assessment.
The discussion focused on the possibility for developing methods for on line analysis, optimisation of methods for different animal or plant species, and comparisons with other methods for identification of origin. The possibility of using NGS as a tool for geographical authenticity assessment was also discussed.

Available IT resources for food authentication
James Donarski – Fera Science Ltd. (Project Coordinator)

The session covered a wide variety of IT tools that have been developed within the food authenticity arena: from detecting where it might (Early Warning System, James Donarski, Fera Science Ltd) or has (website monitoring for reported incidences, Hans Marvin, RIKILT Wageningen) occurred; what to look for in an ever changing environment (Food authenticity risk assessment, Eric Jamin, Eurofins); what analytical methods are available (Food Authenticity Knowledge Base, Alain Maquet JRC, European Commission) or are being developed by regulators (FARNHub, Philippe Vermeulen, CRA-W, Belgium) to detect it; what can be done to prevent it (Industrial Integration Tools, Michele Suman, Barilla SpA); and how to develop a network and community where those that require authenticity solutions can interact (The Food Authenticity Network, Selvarani Elahi, LGC, UK).

Organic food authentication
Jean-François Morin – Eurofins (Work Package 2 Lead)

Organic food authentication is a challenge from an analytical and traceability point of view. However, the need for tools and methods to ensure integrity in this sector has never been so big, because of high prices, a demand exceeding largely the offer and perfectible controlling tools. A review of the state of the art of analytical methods showed that tools are already available for food manufacturers who want to secure their supply chain. Cloud-based tools to verify real-time organic certificates, cross-checking with data from acreage and yields, and mass-balance analysis help to ensure reliability of the traceability chain. Finally, new research approaches for improving confidence in authenticity tests are also explored by researchers. Thus the discussion ended on optimistic note from all the speakers: it will be possible to guarantee genuine organic products in the future.

Tools and needs for the future: gap analysis, interactive workshop
Saskia van Ruth - RIKILT (Work Package 3 Lead)

In the workshop on tools and needs for the future in the final FoodIntegrity conference in Nantes (Session 10), the various steps towards the identification of food integrity research needs over the past five years were discussed. Three main themes identified are: (A) fraud prevention, (B)
methods, and (C) communication to consumers. Within each theme 5 topics were presented. Each participant indicated his/her perceived priority for the 5 topics of each theme. This resulted in an overall ranking of the topics which was presented in the plenary session 15 ‘Forward look’ on November 15.

FoodIntegrity Conference – Nantes 2018

Young science: POSTER AWARD WINNERS

Gold: Application of GC-IMS to discriminate virgin olive oils according to their sensory grades

Enrico Casadei, Filippo Panni, Enrico Valli, Alessandra Bendini, Cesare Rossini, Chiara Cevoli, Diego Luis García Gonzalez, Tullia Gallina Toschi
1-Alma Mater Studiorum - Università di Bologna, Bologna, Italy
2-LabService Analytica, Bologna, Italy
3-Instituto de la Grasa, Sevilla, Spain

Silver: Development of a Next Generation Sequencing (NGS) workflow for food DNA analysis: How to identify meat and fish species in complex food products

Nogueira, S., Manolis, A., Gadanho, M., Chaves, S.
1-SGS Molecular, Lisbon, Portugal
2-Thermo Fisher Scientific, Austin, USA

Bronze: NGS un-targeted approach for herbs and species identification

Pellesi Roberta, Zanardi, S., Mourinha Chaves, S., Nogueira, S., Gadanho, M., Leporati, A., Suman, M.
1-Advanced Laboratory Research, Barilla, Parma, Italy
2-SGS Molecular, Lisbon, Portugal

FoodIntegrity Conference – Nantes 2018

Industry are the main victims of food fraud? A debate on a new paradigm

Paul Brereton – QUB (FI Scientific Coordinator)

The conference held an innovative debate “The food industry is the main victim of food fraud?” Myself (Queen’s University Belfast) Beate Kettlitz (Food & Drink Europe), Shefalee Loth (Which?) and Eric Marin (DG Sante) took part in a 90 minute session excellently facilitated by Lucy Foster (Defra) and which culminated in an audience vote. I put forward the motion that although the consumer was sometimes affected they were rarely the target of the fraud with the vast majority of transactions being business to business. In addition the current sole focus on the consumer was unproductive as it was not addressing the cause of the problem, i.e. the complete lack of protection for the small businesses in the food chain. Beate reinforced the point that industry wanted rigorous standards and penalties in order to remove malevolent actors from the supply chain. However Shefalee and Eric won the vote, successfully arguing that consumers interests had to be paramount and that in many respects industry were victims of their own design. We did all agree however,
through another vote, that we should perhaps be moving the focus from protecting the consumer, to protecting society, from food fraud. Perhaps the subject of our next debate....

**FoodIntegrity Conference – Nantes 2018**

**Targeted versus non-targeted: problems and solutions**  
*James Donarski – Fera Science Ltd. (Fi Coordinator)*

It has been demonstrated that those that commit food fraud are adaptable in their methods, and that they’re able to innovate to beat authenticity tests that rely on markers of fraud. The paradigm of non-targeted methods has evolved, where many analytes are measured simultaneously to define the foodstuff. Normality is measured and therefore frauds detected when foodstuffs are manipulated outside these normal parameters. This session gave guidance and examples of non-targeted analysis. As with newly emerging topics there are no standards and this session covered what the challenges and the solutions are. Kristian Holst Laursen (University of Copenhagen, Denmark) gave an overview of his manuscript on naming conventions, whereas Michele Suman (Barilla SpA, Italy), Carolin Lörchner (German Federal Institute for Risk Assessment, Germany) and Vito Gallo (Politecnico di Bari, Italy) gave examples of the use of non-targeted analysis for mass spectrometry, FT-IR and NMR spectroscopy respectively. Marco Arlorio (Università degli Studi del Piemonte Orientale “A. Avogadro”, Italy) wrapped up the session with guidance on the thorny issue of validation of non-targeted methods.

**FoodIntegrity Conference – Nantes 2018**

**Will Blockchain really solve our food fraud problems?**  
*Niels Lucas Luijckx – TNO (Work Package 17 Lead)*

Did the session answer the question? Well, yes and no. Most attendees that I talked to afterwards were clear on two things, they had learned a lot on what blockchain actually is and they concluded that it may be part of a solution on certain problems in the food chain. However, not a complete solution nor will it solve food fraud problems in general. After a short introduction by the chair people were set to listen to the three speakers. Petter Olsen (Nofima, Norway) was the first and he gave a very good overview of the blockchain technology and its potential application in a part of tracking and tracing. Blockchain is in fact a database with some specific characteristics (it is Distributed Ledger technology). Blockchain is hyped these days because of two distinct
characteristics: once data is entered it is unchangeable (and verified) and it is transparent for all users. If you put in false data, it may haunt you “forever”. Fiona Delaney (Original Chain, Ireland) spoke about authenticity in the agri-food chain, specifically organic, and the systems to guarantee that. Such systems must have multiple perspectives on the chain, the individual producers and the produce itself. Central in these systems is information, stored in databases. One of these could be and is blockchain only in the core to have a firm basis of unchangeable and transparent information.

Finally, Christoph Jansen (Mettler-Toledo, Switzerland) put blockchain in a perspective of several ways to safeguard information and prevent fraud, with a focus on laboratory analytics. He also warned for the general and implicit unsafety of all kinds of hardware and software and implicitly predicted that blockchain will be ‘hacked’ in some future time. Although the session question was not specifically answered, it was addressed well and all three speakers sounded critical to the hype that blockchain will solve problems. We had a good session and a good discussion afterwards.

**FoodIntegrity Conference – Nantes 2018**

**Forward look: future research and innovation needs for the food sector**

**Paul Brereton – QUB (FI Scientific Coordinator)**

This final plenary session focused on the key research needs for the future and had presentations from Razvan Anistoroaei (DGRTD), EIT Food Mercedes Groba (EIT Food), Lucy Foster (DEFRA, UK), presenting on behalf of Authent-Net www.authent-net.eu/) and Saskia van Ruth (RIKILT/Wageningen), presenting on behalf of FoodIntegrity.

Razvan Anistoroaei provided the audience into current thinking for Horizon Europe. He emphasised the key place Food Systems will have in delivering Food 2030 goals and that food safety and authenticity are important components of such systems.

Mercedes presented EIT Food’s strategic research agenda and it key role in “delivering an innovative sector that produces healthy and sustainable food, trusted by society”.

Lucy presented the latest thinking on how Member States funding bodies are hoping to work together in the future, collaboration initiated through the H2020 project Authent-Net.

Saskia presented the latest results from a series of iterative workshops that have taken place throughout the lifetime of the project. Key areas that were highlighted were:

- Food fraud risk analysis
- Non-analytical (food fraud) prevention tools
- Food fraud prevention integration into Food Safety Management Systems
- Rapid fraud detection tools
- Methods harmonisation
- Authentication of complex foods
- Increasing consumer confidence
- Accurate information to consumers
Where to find more information? How to Get Involved?

The FoodIntegrity Website is the best place to find all the information about the project and its activities.

❖ To learn more about the project: ABOUT FI
❖ To download the Infographics: INFOGRAPHICS
❖ To see the current project results: FI RESULTS
❖ To download the FI Handbook: HANDBOOK
❖ To access the FI YouTube Channel: YouTube
❖ To access the information for the past FI conferences: DISSEMINATION

The website also offers a look into the news articles about food fraud as well as many food fraud events around the world.

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Dates for Diary:

FoodIntegrity Associated events:
Food Fraud Conference 28 February 2019, London, UK

External events:
GFSI Conference  
25-28 February 2019, Nice, France
Global Food Summit  
20-21 March 2019, Munich, Germany
1st GHI World Congress on Food Safety and Security  
24-28 March 2019, Leiden, The Netherlands
3rd International Conference on Food and Nutritional Sciences  
5-16 April 2019, Paris, France
6th International Conference on Food Security and Nutrition (ICFSN 2019)  
8-10 April 2019, Barcelona, Spain
XX. EUROFOODCHEM  
17-19 June 2019, Porto, Portugal
133rd AOAC Annual Meeting & Exposition  
8-11 September 2019, Denver, Colorado, USA
11th World Mycotoxin Forum  
14-16 October 2019, Belfast, UK
9th International Symposium on Recent Advances in Food Analysis (RAFA 2019)  
5-9 November 2019, Prague, Czech Republic
33rd EFFoST International Conference 2019  
12-14 November 2019, Rotterdam, The Netherlands

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