

Food Integrity: What is the EU doing to protect our food supply and industry?



On 6-7 April 2016 in Prague, Czech Republic, University of Chemistry and Technology, Prague (Czech Republic) and the 'FoodIntegrity' project organised the 2016 FoodIntegrity conference entitled 'Assuring the integrity of the food chain: FIGHTING FOOD FRAUD'.

With around 250 people from 37 countries in attendance, the conference opened by emphasising



Sue Davies, Which? (London, UK) giving her presentation, "Food Authenticity: Consumer Expectations (and Disappointments)"

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THE GROWTH OF THE SCOTTISH ORGANIC SECTOR

According to the Soil Association the growth in sales of organic products in the Scottish market was 2.6% last year, with an expense of £52.6 million. In Scotland there is strong support for organic development, including the new Organic Action Plan for organic food and farming 2016-2020 and the support of the Scottish Government for a wide range of Soil Association Scotland programmes. ■

More information at: <http://www.farminguk.com/Newscategory/Organic>.

three perspectives: Export, Consumer and Methods. The export perspective focused on China, while the consumer perspective focused mainly on what consumers want and the methods perspective asked how methods can better utilise non-targeted approaches.

The 'Ensuring the Integrity of the European Food Chain' Project ('FoodIntegrity') is funded as part of the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement No. 613688 and implemented by Fera Science Ltd, UK. FoodIntegrity is a €12 million, 5-year (2014-2018) project with 38 participants (increasing to 60) from 18 European countries and China, that is designed to bring together and put in action

measures to protect the authenticity of European food for the sake of consumers and the food industry itself. The project seeks to increase data sharing and data usage to fight food fraud by balancing the needs of regulators and industry with practical methods and tools. Ultimately, the project should help to bolster consumer confidence and fight against food fraud.

An important element of FoodIntegrity, however, was to ask what was still missing from the project. They identified four areas in need of further investigation:

- 1) Non-targeted analysis,
- 2) Complex foods,
- 3) Transparency along the food chain and
- 4) Rapid methods.

Keying in on the third area, Organic Services GmbH ('Organic Services') is currently in the process of joining FoodIntegrity as a project participant. With its comprehensive approach to supply chain integrity, Organic Services presented its project work package at the conference, in which it will conduct a feasibility study of how to better share information along the supply chain to identify risks to food integrity.

Organic Services will assess the feasibility of its solution, Check X, which is already being applied to the organic food supply chain as Check Organic, and to other critical European food supply chains at risk of fraud. Organic Services will work with stakeholders to identify the risks which these food supply chains face, and use its expertise in criteria-based systems to develop risk control mechanisms with these stakeholders to mitigate these risks.

It will look at how these mechanisms could be implemented in Check X to eventually deliver a practicable solution for the supply chains it will examine. The conference featured a variety of presentations on solutions that use both analytical and non-analytical approaches. The analytical element of the conference focused on the application of different methods to authenticate food, by asking first and foremost, what solutions are already out there to address this topic. In response, the project is compiling these methods into a database.

Critical to the use of these methods is the development of both lab and in-field testing methods. Some of the methods being used include near infrared (NIR), Raman, nuclear magnetic resonance (NMR), matrix-assisted laser desorption/ionisation time-of-flight mass spectrometry



Gerald A. Herrmann and Will Meister, with their FoodIntegrity colleagues, demonstrate the basic principle of a supply chain

(MALDI-TOF-MS), ultra-performance liquid chromatography (UPLC) and wet-chemistry. Essentially, researchers are seeking to create a toolbox of methods from which to choose to expand the knowledge base worldwide. One such example is a project led by US Pharmacopeia, which is applying these non-targeted methods to detect signs of contamination in milk ingredients.

Consumers also factor into these analytical methods through the miniaturisation of this technology, such as miniaturised NIR, Raman and UV-Vis equipment, which then gives consumers the power to test their own food. RIKILT Wageningen UR has started testing the usability of this miniaturised equipment with chicken fillets to understand a fillet's freezing history and legal moisture-protein ratio without removing the product from its packaging or having to homogenise the sample.

The aim is to improve the model to better understand if these instruments can be used to determine the aforementioned aspects of chicken fillets. Within the organic sphere, microbes are being investigated as indicators of the organic integrity of fruit. By understanding which microbial communities are present in organic fruits compared with conventional fruits, a helpful tool to quickly and effectively differentiate between the two is being developed. Trials have shown significant differences in the microbial communities of organic and conventional fruits, which could ultimately be developed into a tool for use by consumers.

The importance of a holistic approach to food integrity was made apparent by also asking what solutions are already out there to address this topic from a non-analytical perspective. Led by Fera Science Ltd, an early warning system

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is being conceptualised to understand how fraud can be predicted by keying in on specific indicators that have been shown to be predictors of fraud; therefore, resources can be better directed towards identified risk areas.

Within the EU's Rapid Alert for Food and Feed (RASFF) system, a fraud predictor is currently being tested to aid in the selection of the fraud types to be investigated based on past incidents. In addition to this, a filter has been implemented within the European Media Monitor portal, 'MediSys', and is being evaluated for its efficiency to bring together information on food fraud.

Moving from these macro-industry solutions to more individualised solutions, supply chain traceability

CURRENT PROJECT PARTICIPANTS:

Fera Science Ltd (project manager), Eurofins, Joint Research Centre (JRC) of the European Commission, German Federal Institute for Risk Assessment (BfR), University College Dublin, Queen's University of Belfast, SITEIA.PARMA (University of Parma), Eutema, Wallon Agricultural Research Centre, Research Institute of Organic Agriculture (FiBL), University of Copenhagen, Foundation Agricultural Research Service (Wageningen UR), University of Chemistry and Technology Prague, Edmund Mach Foundation, University of Lisbon, Universidad de Castilla-La Mancha, Spanish Ministry of the Environment and Rural and Marine Affairs, Barilla, Matis, Teagasc – Irish Agriculture and Food Development Authority, Nofima, Agroisolab, Isolab, Spanish National Research Council, Food and Agriculture Organization of the United Nations, Azti, SOLTUB, Food Forensic, University of Newcastle, Polish National Veterinary Research Institute, China National Research Institute of Food and Fermentation Industries, University Medical Centre Utrecht, Scotch Whisky Research Institute, D.D. Williamson, Ocean Optics, SpiritsEUROPE and Sapienza University of Rome, with more to come on board in the very near future.

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DENMARK, THE ORGANIC CONSUMPTION WORLD CHAMPION

Denmark is still the nation in the world that has the highest share of sold organic food products. The national statistics keeper Danmarks Statistik has revealed in its latest figures that the sale of organic food products in Danish supermarkets increased by 12 percent between 2014 and 2015. Currently, 8.4 percent of all goods sold in the Danish retail sector are organic. ■

More information at: <http://cphpost.dk/news/danes-remain-world-leaders-in-organic-consumption.html>.

became the focus of this session. Tracetracker is an individual brand solution, designed to record critical information about the progression of a product through a supply chain, in which a case study of a Swedish meat producer was presented.

Bringing together both a macro- and micro-level approach to food fraud, Organic Services presented its supply chain integrity solution for the organic industry, Check Organic. Check Organic reaches across the organic industry by centralising organic certification data in one location, providing the industry as a whole with a practical solution, and by bringing this data to the micro level within a company's supply chain. Organic Services has

developed a solution for the organic industry that not only provides whole-chain traceability, but also helps to better direct resources to areas that have been identified as potential fraud risks both at the company and product level.

By looking at both analytical and non-analytical approaches, the FoodIntegrity conference aimed to showcase the variety of methods that are being catalogued and tested to aid the European food market in protecting its consumers and its brand. This conference was designed to be a meeting ground for collaboration among a wide variety of stakeholders. While already in the works before the horsemeat scandal broke, it was an unfortunate confirmation of the need

Supply chain management solutions play a critical role in helping to pinpoint where the fraud originated. ■

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PROHIBITION AND RESTRICTION OF PESTICIDES IN HONDURAS

The Programme for Quality Support and Quality and Application of Sanitary and Phytosanitary Measures in Central America (PRACAMS), presented Technical Regulations for the prohibition and restriction of pesticides, under the collaboration agreement between the European Union and Central America (Costa Rica, El Salvador, Honduras, Guatemala and Nicaragua). PRACAMS is sponsored by the EU and implemented by the Secretariat of Central American Economic Integration (Secretaría de Integración Económica Centroamericana - CIECA). The project has a budget of 25 million Euros; 23.5 of them are provided by the EU. The specific objective of the programme is the creation of a Regional Quality System and Application of Sanitary and Phytosanitary Measures (SPS), harmonised and internationally recognised through regional networks. Among the expected results of the programme is the strengthening of the regional network of accreditation, as well as the entities in charge of the conformity assessment. ■

Source: PRACAMS

for the FoodIntegrity project and for the multi-stakeholder approach that gathered at this conference.

This approach stretches as far as the consumer, who can help through citizen science initiatives, and also looks at ways in which criminologists can help in identifying food fraudsters. In order to understand though where fraud is coming from, it is important to lay the groundwork first by modelling the system.

One such example presented at the conference looked at the Spanish olive oil supply chain and modelled its composition to identify vulnerabilities. The question was then asked: Who are the people committing this fraud and why? According to one criminologist, food fraud is understudied, and with evidence from Interpol and Europol suggesting that organised crime is moving into food fraud, there is a pressing need to better understand the motivations and opportunities for committing this fraud.

A real-life example from Dutch swine farmers was also discussed to present the reasoning behind why some in the food supply chain commit fraud – often it comes from necessity; eg, they are at risk of losing the family farm, or in the case of organics, the farmers think that they are actually going above and beyond what the regulations state. The next step then comes down to the actual enforcement of fraud laws that are already on the books. In the UK, they have established the National Food Crime Unit (NFCU) to approach this problem using their experience with other crime types.

The conference emphasised the need for working together across disciplines using a variety of approaches to track down the source of the fraud. Supply chain management solutions play a critical role in helping to pinpoint where the fraud originated, where it went from there and how it entered the supply chain in the first place.

If you are interested in taking part in the Check X feasibility study, please contact Organic Services. ■

- More information about the FoodIntegrity project is available at: <https://secure.fera.defra.gov.uk/foodintegrity/index.cfm>
- More information about the 2016 FoodIntegrity conference is available at: http://www.foodintegrity2016.eu/prague_czech_republic.html

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