Article

NIR news

NIR news
2020, Vol. 31(5–6) 19–20

DOI: 10.1177/0960336020944003
journals.sagepub.com/home/nir
SAGE

The European Network for assuring food integrity using non-destructive spectral sensors (SensorFINT) has been approved by COST

Lola Pérez-Marín

Cost Actions are competitive projects funded by the European Cooperation in Science and Technology (COST) organisation with the main objective of promoting the creation of research networks in innovative areas, facilitating the collaboration between the academia and the industry in Europe and beyond.

In this European framework, in March 2020, it has been approved the Cost Action entitled "*European Network for assuring food integrity using non-destructive spectral sensors*" (SensorFINT). The main general aim of the Action is to create within the EU a vibrant and multidisciplinary network, combining experience in research, manufacture, training and technology transfer in relation to non-destructive spectral sensors, which can accelerate its implementation within the food industry. Furthermore, it will generate and disseminate knowledge about these emerging and innovative technologies and their application for the real-time *in situ* control of critical quality, safety, authenticity, and performance attributes for raw and in-process materials, i.e. in the entire food chain, allowing to increase the transfer of knowledge from academia to the industry and, therefore, to improve European food industry competitiveness.

Currently, the increasing complexity of food supply chains has provided more opportunities for food fraud, resulting in many food crises over the years (BSE, melamine, horse meat, fipronil in eggs, etc.), which reduces the confidence of the consumers in the industry, inspectors, and policy makers. These scandals have placed increased focus on developing measures to ensure the integrity of the food in the whole chain, and thereby reduce the incidences of food fraud. The analytical needs for the agri-food industry are linked not only to compliance with regulations but also to the need to control their processes through an "intelligent quality control," along with knowing the variability of raw materials and the final product for increasing its competitiveness. Inaccurate or uninformative quality and safety assessment methodologies are detrimental to producers, processors and ultimately to consumers of food products. In addition, new strategies related to the adoption of "non-targeted" methods—able to analyse the product and produce a food fingerprint that can provide information on quality and authenticity—are demanded.

Therefore, to verify integrity in marketed products, it is necessary to update the current analytical and sampling control systems, through the development of modern and cost-effective analytical methods. This situation has forced the food businesses to rethink their risk mitigation processes, especially as food fraud is opportunistic and can be difficult to detect through classical analytical methods that look for specific components in the food. Traditional methods of analysis are too slow and expensive to facilitate adequate production, but the nature of non-destructive spectral sensors, combined with specific data processing techniques, fits perfectly with these needs.

Spectral sensors enable rapid, non-destructive, accurate, and cost-effective analysis of large numbers of samples and the measurement of multiple parameters in a variety of products and processes. One of its main advantages is related to the large amount of product that can be analysed when it works in continuous mode. SensorFINT is focused in answering this problematic through the use of non-destructive spectral sensors. Among the available spectral sensors, near infrared spectroscopy (NIRS) is currently one of the most suitable for implementation within the food industry. But also the Action will consider other spectral technologies—as fluorescence, Raman, thermal or time-resolved spectroscopy, and their fusion or combination with multi-spectral imaging—to provide solutions for critical issues that cannot be managed just with a sensor alone.

Most applications of these technologies in the food industry are made at-line. Industry requires them to be deployed *in situ* and preferably online for full process control over the entire food chain. These requirements introduce constraints on sensor design and calibration

Faculty of Agriculture and Forestry Engineering (ETSIAM), University of Cordoba, Córdoba, Spain

Corresponding author:
Lola Pérez-Marín, Faculty of Agriculture and Forestry Engineering (ETSIAM), University of Cordoba, Rabanales Campus, 14071 Córdoba, Spain.
Email: dcperez@uco.es

development, which do not normally apply to laboratory-based instruments. Long-term stability of instruments, robustness of the calibrations, sensor integration in production environments, transferability of data, and the building of real-time decision-making systems are critical issues to be considered. SensorFINT will approach to the challenge related to the development and implementation in the agri-food industry a ready to use analytical system based on the integration and combination of low-cost, portable and miniature spectral sensors and information and communication technologies (ICTs) for process control and voluntary labelling, to guarantee the integrity and international image of EU high added-value products. In addition, other important aspect taken into account is related to the development of advanced mathematical algorithms and new chemometric tools for increasing the robustness of the prediction models and the use of the information generated in an industrial situation. The final objective is to provide tools for taking decision in real-time through the design and development of decision support systems linked to the control board of the industrial processes.

The Action will operate by developing generic solutions to existing and emerging problems in non-invasive food process control, building a "smart food control system" as well as developing a cadre of well-trained young researchers who will convert scientific results into a reality that matches industrial needs.

To address these objectives and challenges, the project is structured into five following Working Groups:

1. NDSS for the innovation in process control and labelling in the European food industry.
2. Innovation related to the integration of several NDSS signals for critical issues in food integrity.
3. Novel mathematical algorithms and methods for processing NDSS in real time.
4. The use of information and communication technologies (ICTs) in building decision support systems for the industrial implementation of NDSS.
5. Dissemination and exploitation.

SensorFINT Action joins actually leader partners from 26 countries, and it is opened to the incorporation of new researchers working on spectral sensors, data processing or information and communication technologies. The Action will start officially at the beginning of October 2020, and will continue during four years.

More information can be found in the following link: https://www.cost.eu/actions/CA19145/#tabs|Name:overview.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.