

FOOD FORMULATION FOR THE FUTURE

For a fair, healthy and
environmentally-friendly
food system

30 September 2020



Welcome to Food Innovation Gateways

Food Formulation for the Future – For a fair, healthy and environmentally- friendly food system

10.00am – 11.10am

Welcome with **Shay Hannon, Prepared Consumer Food Centre Manager, Teagasc**
and Introduction with **Gerry Boyle, Director, Teagasc**

The Importance of Innovation in the Context of Food Formulation for the Irish Food Sector

Linda Stuart-Trainor, Director of Prepared Consumer Foods, Food Drink Ireland

Emerging Technologies for the Reformulation of Foods

Ciara McDonnell, Agriculture and Food, CSIRO, Australia

11.10am – 12.30pm

Supporting Food Businesses in their Product Reformulation Journey

Shay Hannon, Prepared Consumer Food Centre Manager, introduces key Teagasc researchers. These experts will demonstrate the latest concepts and technologies, to help food companies address the opportunities, and meet the challenges, of product reformulation for healthier foods in line with the European Green Deal.

This will be followed by a live Q&A session with the Teagasc panel.

- Challenges and Opportunities for Food Reformulation
- Trends in Bakery Reformulation
- Advantages of using Pulsed Electric Field (PEF) Technology in Food Reformulation
- Analysis of the Nutrient Composition of Reformulated Foods
- The Role of Packaging in Food Reformulation
- The Impact of Food Reformulation on Safety and Shelf-life
- Novel Drying Strategies Underpinning Food Reformulation
- A Sensory Science Toolbox for Food Product Innovation
- Meat Product Reformulation - Challenges and Technological Strategies
- Studying the Impact of Reformulation on Food Microstructure

Challenges and Opportunities for Food Reformulation

Shay Hannon (shay.hannon@teagasc.ie)

Teagasc supports food companies on their product reformulation journey and offers access to a range of technologies and food processing equipment within the Prepared Consumer Food Centre. Our facilities include a development kitchen which provides a space for companies to conduct product development activities and includes a range of bench-top processing and cooking equipment. Our pilot plant allows for larger scale development and includes a range of specialised equipment such as a Twin Screw Extruder, Air Drier and Universal Processing Machines which can be used for the development of a vast range of food products. Our Packaging Suite contains a range of depositors and packing equipment that can be used to produce a final shelf ready pack.



Trends in Bakery Reformulation

Eimear Gallagher (eimear.gallagher@teagasc.ie)

Teagasc conducts fundamental and applied research in the cereal and bakery area, focusing on current trends in product reformulation. We offer extensive advice in the application of novel flours and ingredients in wheat and gluten-free bakery formulations, and in reduced fat and sugar products, with a particular focus on natural, healthy ingredients. Our facilities include a mill room, test bakery, dough rheology lab and sensory suite, all of which are used to support companies in the areas of ingredient selection, product reformulation, mixing regimes and baking practices for a wide range of bakery products.



Advantages of using Pulsed Electric Field (PEF) Technology in Food Reformulation

Brijesh Tiwari (brijesh.tiwari@teagasc.ie)

The focus of the food industry has shifted towards advanced food processing technologies due to an increased consumer demand for safe and nutritious food and the need for improved process and energy efficiency. The Prepared Consumer Food Centre, Ashtown, hosts a range of advanced systems including pulsed electric field (PEF), plasma technologies, cavitation technologies and UV light based technologies. PEF is a versatile non-thermal technology that can be applied in the development of reformulated food products, offering improved safety profiles, nutritional, shelf-life and sensory properties across a wide range of foods.



Analysis of the Nutrient Composition of Reformulated Foods

Martin Danaher (martin.danaher@teagasc.ie)

The application of advanced analytical techniques is critical to support the development of reformulated food products, particularly those with enhanced nutritional claims. The state-of-the-art equipment and analytical methods available within the Prepared Consumer Food Centre, Teagasc, allows for the determination of macronutrients, sugars, minerals, water soluble and fat soluble vitamins. We also offer a range of nutritional tests that can be conducted to assess food product quality in relation to allergens and toxins.



The Role of Packaging in Food Reformulation

Shivani Pathania (shivani.pathania@teagasc.ie)

There is an increasing trend towards healthy, natural and minimally processed high-quality foods, while exhibiting an acceptable shelf-life. With many companies looking at reducing fat, salt and sugar levels, food packaging has a critical role to play in enhancing the safety, quality and sensory properties of these reformulated food products. Along with extensive expertise in food product and packaging development, the Teagasc Prepared Consumer Food Centre houses a range of versatile packaging equipment for applications across the sector from raw, semi-cooked and ready to eat liquids to semi-solid, solid, dry and granular food products.



The Impact of Food Reformulation on Safety and Shelf-life

Kaye Burgess (kaye.burgess@teagasc.ie)

When developing or adapting food formulations, ensuring that new formulations and processes will suppress microbial growth to maintain product quality and safety, is essential. Teagasc has a wealth of experience in this area, as well as the facilities and expertise, to provide support to food companies in their R&D activities and in addressing this challenge for food reformulation. Our dedicated biocontainment unit allows us to use relevant foodborne pathogens to validate the safety and shelf-life of products, using real food chain conditions, facilitating a key step in the commercialisation process for reformulated products.



Novel Drying Strategies Underpinning Food Reformulation

Eoin Murphy (eoin.murphy@teagasc.ie)

Drying technologies stabilise perishable ingredients and finished products, playing an important role in determining the properties of formulations. Teagasc actively engages with food companies of all sizes in the manufacturing and assessment of ingredients, recipe development, intermediate processing and drying of formulated food products. The infrastructure and expertise at Teagasc Food Research Centre, Moorepark provides customers with the tools to develop formulated foods from lab-scale through to commercial scale. Our extensive laboratories allow customers to assess the effect of processing and drying on formulation properties, from viscosity to protein conformational changes, to detailed microstructure of finished powders and much more.



A Sensory Science Toolbox for Food Product Innovation

Emily Crofton (emily.crofton@teagasc.ie)

Sensory science has advanced significantly in the past decade and is quickly evolving to become a key tool for predicting food product success in the marketplace. The Sensory Science Suite, located at Teagasc, Ashtown, is a state-of-the-art facility comprising an array of sophisticated sensory testing techniques to better understand the human sensory response to food products. We have extensive experience in characterising the appearance, flavour and texture profiles of foods using a range of traditional, rapid and temporal sensory methods. Through our facility, companies have access to both trained and consumer taste panels for the assessment of food products for a range of applications including product development, quality control and shelf-life testing. Within our research programme, we are using immersive virtual reality technology and biometric sensors (eye-tracking, GSR, EEG, facial expression) generating unique insights into consumer sensory preferences and subsequent food choice behaviour. Our sensory testing facility is equipped with 18 individual computerised testing booths and an adjoining kitchen containing specialised cooking equipment. All booths are equipped with adjustable lighting (white, red and green), together with the latest sensory data collection software.



Meat Product Reformulation – Challenges and Technological Strategies

Cristina Botinestean (cristina.botinestean@teagasc.ie)

Most of the current innovations in processed meats focus on healthier reformulations through reducing components, such as salt and saturated fat, or by inclusion of nutritional/health promoting ingredients. However, understanding the functionality of these ingredients is essential when reformulating meat products, as it is important to maintain the quality and safety of these type of products. Our meat processing unit provides a wide range of equipment of varying capacities for different meat product applications. These capabilities, teamed with the expertise of our researchers, provide valuable support to companies developing reformulated meat products.



Studying the Impact of Reformulation on Food Microstructure

Laura G. Gómez-Mascaraque (laura.Mascaraque@teagasc.ie)

Understanding the role of the composition, formulation and processing of food products on their microstructure can help designing strategies to improve the functional, organoleptic and nutritional characteristics of those products. The microscopy platform of the Teagasc National Food Imaging Centre is used to study how changes or variations in ingredient composition and functionality impact the microstructure of reformulated food products. This platform includes a wide range of advanced microscopy techniques to support the different needs of the food industry.



