THE ROLE OF FOOD SCIENCE AND RESEARCH ON DEVELOPING OF SUSTAINABLE AND SAFE FOOD PRODUCTS IN IRELAND

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Teagasc

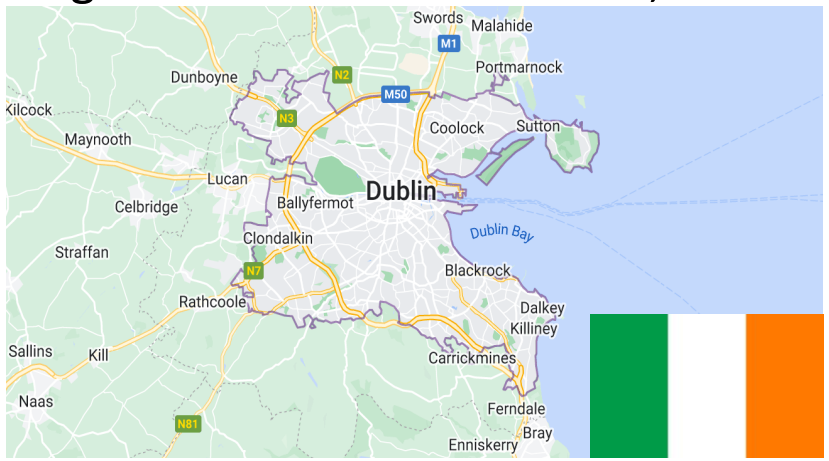
Agriculture and Food Development Authority

Career overview

University of Life Sciences “King Mihai I”, Timisoara, Romania

University of Natural Resources and Applied Life Sciences, Vienna, Austria

Teagasc Food Research Centre, Ireland



Agriculture and Food Development Authority

Ireland in the context of sustainable food products

- Developing sustainable and safe food products in Ireland is an increasingly important issue, given the country's reliance on agriculture and food production as a key industry
- There is a growing demand for sustainable and safe food products, both from consumers and from regulatory bodies
- This demand is being driven by concerns around environmental sustainability, food safety, and health and wellness
- In response, the Irish food industry is exploring new ways to develop sustainable and safe food products, including the use of environmentally friendly production practices, innovative packaging solutions, and the development of healthier and more nutritious food products

Teagasc in the context of sustainable food products

- Is the Agricultural and Food Development Authority in Ireland, and we are committed to promoting sustainable food production practices
- Grass-fed beef: Teagasc promotes the use of grass-fed systems in beef production as a more sustainable alternative to intensive grain-fed systems.
- Sustainable dairy farming: Teagasc works with dairy farmers to develop more sustainable farming practices, such as reducing greenhouse gas emissions and improving animal welfare
- Locally sourced vegetables: Teagasc has developed a program to support the growth of locally sourced vegetables in Ireland
- Low-carbon lamb: Teagasc is working with sheep farmers to develop low-carbon lamb production systems

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AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

National Prepared Consumer Food Centre (NPCFC)

- Established to support research, development & innovation in the prepared consumer food sector
- State-of-art pilot scale processing equipment
- Promotes research & development in collaboration with other Institutes
- Important role on supporting companies in piloting industry-led collaborative research & innovation

Food Product Innovation

Cereal-based, Bakery and Snack Products Suite

Meat Product Processing Suite

Nutritional Quality Suite

Sensory Science Suite

Advanced and Emerging Technologies

Advanced Packaging Suite

Microbial Safety and Shelf-life Suite

National Prepared Consumer Food Centre (NPCFC)

Some of the research areas currently being undertaken by the NPCFC include:

- Developing new meat and poultry products
- Developing meat analogues
- Investigating the use of novel ingredients in food products
- Improving the shelf life of prepared consumer foods
- Developing packaging technologies to extend the shelf life of foods
- Evaluating the nutritional content of prepared consumer foods
- The NPCFC also provides training and support to the food industry through workshops, seminars, and training courses. Its aim is to help Irish food businesses develop and grow, while ensuring that consumers have access to safe, high-quality prepared consumer foods

NPCFC – food processing technologies

- **UV light system** is used for disinfection of food products surfaces, packaging, and other food contact surfaces, it ensures food safety, improved shelf-life and doesn't produce chemical residuals
- **Freeze-drying** is a dehydration process that removes water from food products by sublimation
- **Ultrasound processing** uses high-frequency sound waves to disrupt and break down cell walls in food products
- **Pulsed electric field (PEF)** processing uses high-intensity electric pulses to disrupt cell membranes in food products, which can lead to improved extraction of bioactive compounds, increased shelf life, and reduced energy consumption.

FOOD INNOVATION GATEWAYS

Science & Research

- Proposals writing & funding opportunities
- Supervision of PhD Walsh Scholars
- Supervision of national & international students

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

TU DUBLIN
OLLSCOIL TEICNEOLAÍOCHTA BHAILE ÁTHA CLIATH
TECHNOLOGICAL UNIVERSITY DUBLIN

Food Safety AUTHORITY OF IRELAND

NPCFC

- Food industry projects
- Provide consultancy and expert knowledge
- Develop innovative food products

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

Bord Bia
Irish Food Board

ENTERPRISE IRELAND

Sensory analysis

- Inventor
- Tutor
- Sensory Scientist

MEAT TECHNOLOGY IRELAND

Institute of Food Science + Technology ifst

mla
MEAT & LIVESTOCK AUSTRALIA

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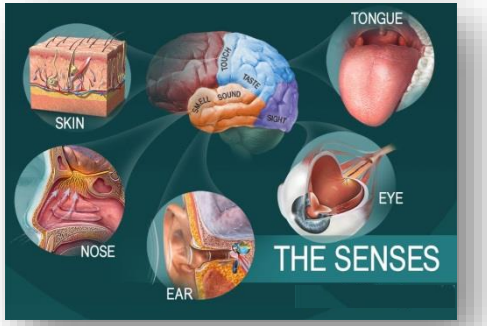
Sensory Science…more than just taste!

- For years, Sensory Science methods have focused on asking consumers what they like or dislike about a food product. In today's highly competitive and global food environment, a deeper understanding of consumers' sensory perceptions is needed, so innovative foods can be designed with optimal consumer benefits.

- Novel biometric tools have the ability to capture physiological responses from consumers, removing the biases associated with traditional methods, and providing a deeper and more realistic insight into consumers' perceptions towards foods products.



Multisensory experiences

- Augmented nutritional information could induce expectations of satiation and ultimately reduce the amount of food consumed, while creating multisensory experiences could heighten the senses providing new taste experiences for consumers
- Understanding the nutrition information and ingredients list can help you make healthier choices

Galvanic Skin Response (GSR)

Measure emotional arousal & stress by measuring changes in the conductivity of the skin

Facial Expression Analysis

Gain deeper insights into human emotional reactions

Eye Tracking Glasses

Detect visual attention in real life and lab environments

Electroencephalography (EEG)

Detect cognitive and motivational processes

Food Vision 2030

Is a strategic plan developed by the Irish Government to guide the growth and development of the country's food industry towards a sustainable, healthy, and prosperous future

Here are some key things about Food Vision 2030:

- **Objectives:** The plan has several key objectives, including reducing greenhouse gas emissions, improving soil health, promoting healthy diets, and enhancing competitiveness in the food industry
- **Strategies:** Food Vision 2030 outlines several strategies to achieve its objectives, such as investing in sustainable agriculture, reducing food waste, promoting innovation in the food industry, and enhancing collaboration between different stakeholders in the food system
- **Implementation:** The plan is being implemented through various initiatives and programs, such as the Agri-Food Strategy 2030, which aims to transform the Irish agri-food sector into a more sustainable and competitive industry
- **Benefits:** Food Vision 2030 is expected to bring several benefits to Ireland, including improved public health, increased economic competitiveness, and reduced greenhouse gas emissions

Dr. Cristina Botinestean

"The overall process went smoothly. I judged 26 pupils (6th class) on the project: "Why do some foods 'go off' quicker than others?" The experience was enchanting, and I was delighted to see the pupils' involvement and how much work they've invested into their food research trials. It was fascinating to see their excitement after receiving my feedback and their joy after getting their Science Blast trophy."

- Science Blast is an initiative run by Science Foundation Ireland (SFI) that aims to promote STEM (Science, Technology, Engineering, and Mathematics) education in primary schools throughout Ireland
- Science Blast encourages students to investigate and explore scientific questions in a fun, interactive and collaborative way.
- It is a team-based program, where students work together to carry out scientific investigations, analyse data and present their findings to a wider audience
- The program provides students with opportunities to develop their critical thinking, problem-solving, and communication skills while learning about the scientific method and how it can be applied to real-world problems

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Texture Studies
A Journal for Food Oral Processing Research

food structure · fracture mechanics · food physics · food oral processing · food structure · texture · oral physiology · saliva

Innovative Food Science & Emerging Technologies

Open Access Article

Exploring the Effects of Immersive Virtual Reality Environments on Sensory Perception of Beef Steaks and Chocolate

by Emily Crofton [1,*], Niall Murray [2] and Cristina Botinestean [1]

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[2] Athlone Institute of Technology, Faculty of Engineering and Informatics, Department of Computer and Software Engineering, N37 F6D7 A…
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Comparing consumer liking of beef fro… three feeding systems using a combination of traditional and tempor… liking sensory methods

L.C. Corcoran [a], P Schlich [b c], A.P. Moloney [d], E. O'Riordan [d], Millar K [a], C. Botinestean [a], E. Gallagher [a], M.G. O' Sullivan [e], E.C Crofton [a]

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Jun 2018
Pages i, 247-348

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Meat Science
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The influence of the interaction of sous-vide cooking time and papain concentration on tenderness and technological characteristics of meat products

Cristina Botinestean [a], Mohammad Hossain [b], Anne Maria Mullen [a], Joe P. Kerry [c], Ruth M. Hamill [a]

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