

Market and policy issues

Both global and EU market policy issues impact strongly on the Irish food sector, given that Ireland is primarily a food export country. The coronavirus pandemic will undoubtedly impact severely and will add to the known challenges coming on stream as a result of Brexit for the dairy, meat, marine and prepared consumer foods industries. These include complexities in trading, volatility in exchange rates, and the possibility of new international competition through trade deals between the UK and other countries. In addition, Ireland, as the EU's largest surplus milk producer (percentage of total output), is more exposed to the vagaries of the world market than other EU member states. Furthermore, international food markets are transitioning towards a more resource-efficient, sustainable and circular bioeconomy and food manufacturers will need to adopt new technologies to implement circularity along the product supply chain via increased energy efficiency, lower waste, development of novel by-products, and reduced carbon emissions. Against the backdrop of these many challenges, the Irish food sector retains its outstanding food quality and safety standards, which have played a significant part in its economic success, and as a result Ireland is well placed to meet the growing global demand for food.

Shape and size of sector at present and in 2027

Ireland's agri-food sector continues to be the most important indigenous industry, playing a vital role in Ireland's economy. Irish food is produced by thousands of farmers, fishers and agri-food companies and in 2018 was valued at €13.7bn, with exports to 180 markets worldwide, accounting for 10% of merchandise exports and contributing enormously to the viability of Ireland's rural and coastal communities. Food Wise 2025 is the current Irish Government strategy, which aims to position Ireland as a world leader in sustainable agri-food production, and Teagasc has played a key role in the meeting of, and the exceeding of, many Food Wise targets.

It is anticipated that the agri-food sector will continue to be the most important indigenous industry into the future, as global populations continue to rise and the demand for quality food and ingredients (including plant-based products) increases. Teagasc's Technology Foresight 2035



sets out the key technologies which will drive competitiveness and sustainable growth in the Irish agri-food sector into the future. Technologies identified include:

- current and future advances in sequencing and metagenomic technologies will greatly advance our understanding of microbial ecosystems and the fundamental importance to livestock production, food production, food safety and human gastrointestinal health;
- digital technologies, including artificial intelligence systems, robotics, augmented reality, etc., are set to revolutionise the way the food sector operates, and will lead to the automation of tasks or the augmentation of human activity; and,
- the circular bioeconomy will provide new criteria by which food production and processing will be measured – the implementation of zero waste and new processing technologies (including biotransformation and bio-refining) will be key in the development and expansion of this more renewable and sustainable agri-food sector.

Environmental and land use implications

Consumers are increasingly looking for evidence of the implementation of sustainability measures in the food chain, while manufacturers strive for a circular bioeconomy to valorise waste streams.

Research and technology transfer actions

Food research provides sustainable science-based innovations and solutions for the Irish food industry, to ensure economic development and profitability. This is achieved across five broad research and technology areas:

- food biosciences – encompasses food and health research and innovation through identification, optimisation and development of food and food components (derived from milk, plant, grain and marine sources, with the inclusion of fermented foods) – and the investigation of the microbiota of the human and the animal gut;
- food chemistry and technology – focuses on cheese, infant formula, dairy-based ingredients, and the application of disruptive technologies for extraction and stabilisation of food – this includes studies on food digestion, and bio-availability, for the benefit of consumer health;
- food quality and sensory science – focuses on farm to fork processing, from genomic approaches for improved fresh meat quality, through to the application of innovative processing technologies for the development of healthy meat and bakery products with optimised sensory attributes, coupled with a science-based understanding of ingredient interaction;
- food safety – provides science to underpin a total chain risk-based approach to the safety of Irish food, focusing on microbial and chemical contaminants, encompassing a one-health approach; and,
- food industry development – supports innovation in Irish food companies through the provision of technology development supports and the transfer of knowledge/technology outputs.

Some initiatives underway

- A National Prepared Consumer Foods Centre has been established at the Teagasc Food Research Centre, Ashtown, to support Ireland's prepared consumer foods sector as it copes with the challenge of Brexit.
- A National Food Innovation Hub is under construction at the Teagasc Food Research Centre, Moorepark to accommodate food companies involved in research innovation activities and to support companies in their drive for the diversification of export markets.

- A Bia Innovator facility is under construction at Teagasc Athenry to provide training and incubator space to the artisan/SME food sector.
- Significant investment has been made in developing and expanding the pilot plant facilities at Moorepark Technology Limited.
- A Food Biotest facility is to be constructed on the Moorepark campus to allow for determination of digestible indispensable amino acid scores (DIAAS) and pathogen challenge research.
- Investment continues in state-of-the-art analytical instrumentation for residue detection, food composition analysis, microstructure, DNA sequencing and sensory science.
- Adaption of molecular technologies, including next-generation sequencing to 'in-plant' applications for enhanced food safety.
- Teagasc food research continues to participate in projects such as VistaMilk, APC Microbiome Ireland, Food for Health Ireland, Meat Technology Ireland and the Dairy Processing Technology Centre.

Outcome of these actions

- Natural resources diversified to optimise our nutrition, creating circularity through valorisation of all food biomass streams (including waste) to generate alternative by-products for new market opportunities.
- Implementation of digital technologies within the food industry, including augmented and virtual reality, internet of things, robotics and artificial intelligence.
- Accelerated growth of SMEs through product development supports and access to scientific expertise, pilot-scale food production facilities, product testing laboratories and product development expertise.
- Engagement in H2020 Bio-Based Industries Joint Undertaking Programme and Horizon Europe funding calls, along with Irish food industry and SME partners.
- Ongoing support for innovation in food, and the delivery of the ambitious vision outlined in Food Wise 2025, Technology Foresight 2035, and the new Department of Agriculture, Food, and the Marine agri-food strategy (2021).

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The road map for food is available on www.teagasc.ie.