

Food Technology and Strategy

The University of Birmingham has significant expertise in the development, formulation, and application of novel food and beverage technologies and strategy. Our interdisciplinary approach to research, both in terms of science and policy, enables organisations collaborating with the University to benefit from the latest technological developments set within a broader regulatory and socioeconomic context.

Foods should be safe, optimised for health benefits, and enjoyable to prepare and eat, yet a number of these criteria are conflicting. That is because food, which is stable and safe, will often not breakdown and deliver sensory responses and flavours when consumed. The design of food processes and microstructures is a major research area in the School of Chemical Engineering at the University of Birmingham. We carry out research that provides underpinning support to the food industry and drives innovation forward into new areas demanded by both consumers and policy makers.

Our projects include the development of healthy foods that are convenient, safe, accommodating to a normal diet, and could even be considered as indulgent; and the design of food processes with zero waste and thus lower environmental impact.

Our expertise

- Food structure, formulation, function and performance
- Food safety management
- Safe processing of complex liquid foods
- Behaviour, consumer health and policy
- Edible materials for additive manufacturing
- Crop conservation and diversity

Success and impact

- Research carried out in the School of Chemical Engineering has led to the adoption of novel process techniques by a range of multinational food businesses (including Unilever, Cargill and PepsiCo) to engineer a series of fat-reduced foods such as low-fat spreads, dressings, margarine, sauces and mayonnaise
- The Centre for Formulation Engineering in the School is developing research in a number of other areas including patented technology for chocolate, baked goods and low-fat snacks
- Our research is enabling the food industry to address the specific challenge of producing volume-sales food products that have low or zero-fat content whilst retaining the taste and texture demanded by consumers

'THE UNDERSTANDING DEVELOPED BY THE UNIVERSITY OF BIRMINGHAM HAS ENABLED US TO MANUFACTURE AND DEVELOP SUPERIOR QUALITY LOW-FAT FOODS... IN THE ABSENCE OF THIS RESEARCH WE WOULD HAVE HAD CONSIDERABLY REDUCED ABILITY... AND ARGUABLY MANY PRODUCTS MAY NOT HAVE BEEN PRODUCED AT ALL.'

JOHN CASEY, VICE PRESIDENT BIOLOGICAL SCIENCES, UNILEVER R&D



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Key projects

Design of food processes and microstructures: A major thrust of our work is the design of foods which deliver 'unhealthy' functionality whilst being significantly healthier than current convenience products. Our efforts are focused on understanding and manipulating the microstructure of foods to engineer products that deliver the desired consumer attributes but with a dramatic reduction in the amounts of fat, sugar, and salt consumed in the diet.

Food safety and hygiene: Our aim is to develop a fundamental understanding of how to ensure food safety through process design and equipment cleanliness. This involves the development of computational models predicting thermal and flow fields in processes, the formation and removal of fouling deposits and their combination with models for microbial behaviour, as well as the use of process probes such as Positron Emission Particle Tracking (PEPT) and Time-Temperature Indicators (TTIs) in validation.

Strategy and policy: Our research in this area focuses on business ethics and corporate social responsibility, exploring the strategic management of firm-stakeholder relationships and their impacts on company performance and reputation.

Cultivating resistant crops: The University is working with the Crop Trust and the Food and Agriculture Organisation of the UN to systematically plan and implement effective conservation of crop wild relatives (CWR). CWR are wild species which include the natural diversity required to provide resistance to pests, diseases and global climate change, helping to ensure security in our food chain.

Edible Materials for Additive Manufacturing (3D Printing):

The ability to design and accurately build complex edible structures offers great advantages when creating products with well-defined ingredient distribution, texture and release properties.

Health Psychology: Based in the School of Psychology, our research seeks to better understand healthy eating including the mechanisms behind the development of unhealthy eating behaviours. This research theme focuses on understanding people's emotions, cognitions and behaviours in maintaining health, adapting to ill-health, and coping with or managing long-term conditions.

Getting in touch

To learn more about engaging with the University please contact:

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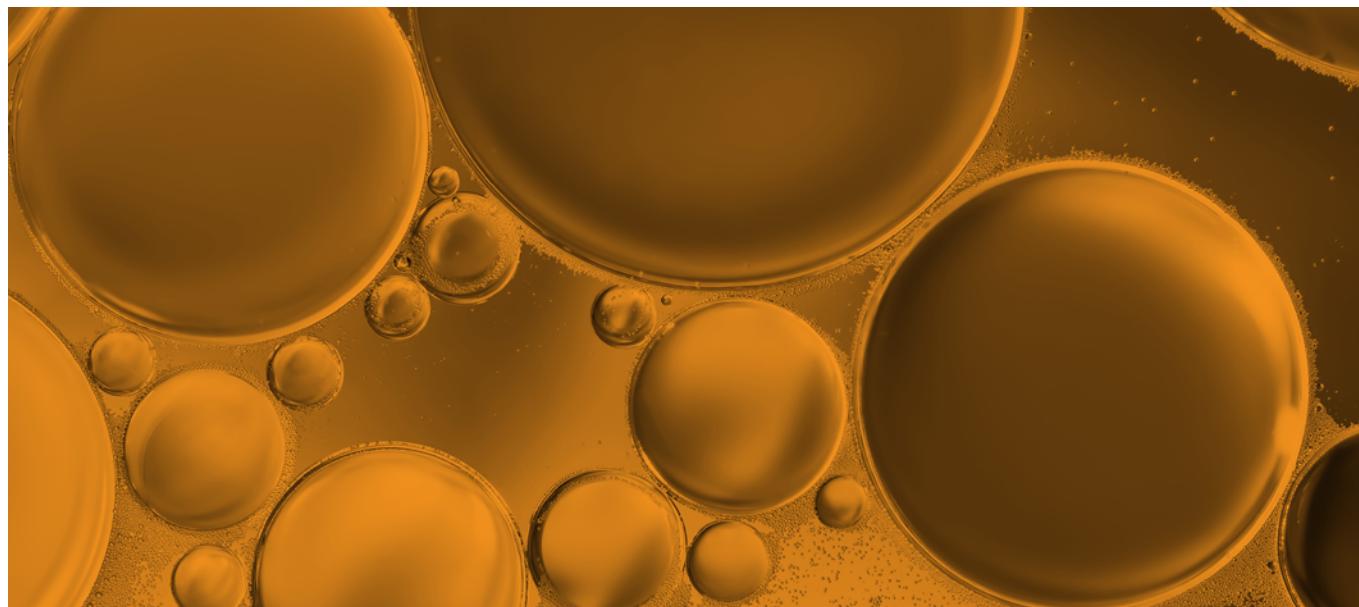
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