FoodBioSystems DTP - PhD Project Advertisement Text

Project Title: FOODBIOSYSTEMS - Risk assessment of cakes with reduce sugar - a new detailed view on the role of microenvironments

Lead Supervisor: Dr Kimon Andreas Karatzas, University of Reading, Department of Food & Nutritional Sciences
Email: k.karatzas@reading.ac.uk

Co-Supervisors:
Eirini Velliou, University of Surrey
Anisha Wijeyesekera, University of Reading
Gethin Humphreys, Premier Foods

Research Group: FOODBIOSYSTEMS BBSRC DTP
Project ID: FBS2020-59

Application Deadline: 6 March 2020

Project Description: Microbiological challenge testing is used in the food industry as a tool for risk assessment of foods. However, this approach may be limited as outputs of challenge testing are occasionally misaligned against true risk. The impact of this limitation is significant as it may result in a high volume of waste, as products deemed unusable may be withdrawn based on wrong assumptions derived from risk assessments. Furthermore, development of nutritionally improved products may not be pursued due to microbiological concerns.

Therefore, the project aims to investigate the limitations of Microbiological challenge testing as a tool for food risk assessment in a commercially representative model food system, such as a cake and will consider the reduction of sugar in such a model system. Sugar reduction is a major drive within the food industry due to negative impact on health (obesity, hypertension etc.). However, in most foods, sugar acts as antimicrobial and its reduction can result in microbial growth with major consequences in stability and potentially safety of foods.

The project will aim to improve tools underpinning the risk assessment of products through a new approach looking at the effect of factors in microenvironments of a food system. This will be achieved first by looking at the actual discrepancies between the predicted and actual growth. Subsequently, with the use of various techniques (confocal microscopy, SEM, NMR analysis) specific factors present in microenvironments within the cake structure affecting microbial growth will be considered. The project will also look for optimal methods to inhibit microbial growth which could be used in the future in various products where sugar reduction is required or even other products.

This work will be used as a paradigm of how we could optimise challenge testing and risk assessments in the future for other products where sugar reduction is required.

Funding Notes: This project is part of the FoodBioSystems BBSRC Doctoral Training Partnership (DTP), it will be funded subject to a competition to identify the strongest applicants. Due to restrictions on the funding, this studentship is only open to UK students and EU students who have lived in the UK for the past three years.

This project is a CASE studentship with Premier Foods.

The FoodBioSystems DTP is a collaboration between the University of Reading, Cranfield University, Queen's University Belfast, Aberystwyth University, Surrey University and Brunel University London. Our vision is to develop the next generation of highly skilled UK Agri-Food bioscientists with expertise spanning the entire food value chain. We have over 60 Associate and Affiliate partners. To find out more about us and the training programme we offer all our postgraduate researchers please visit https://research.reading.ac.uk/foodbiosystems/.

Training opportunities: There will be training offered in various advanced methods and techniques. There will be a placement in Premier Foods, which is the industrial partner in the project.

Student profile: This project would be suitable for students with a UK Honors Degree at 2:1 level in Food Science, Microbiology, Biology, agriculture, or a closely related science