

FoodBioSystems DTP - PhD Project Advertisement Text

Project Title: FOODBIOSYSTEMS - Exploring the upcycling potential of distilled grain as whole ingredients for the development of novel plant-based foods.

Lead Supervisor: Paola Tosi, University of Reading, School of Agriculture, Policy and Development

Email: p.tosi@reading.ac.uk

Co-Supervisors:

Valentina Stojceska, Brunel University London, College of Engineering, Design and Physical Sciences

Simona Grasso, University of Reading, School of Agriculture, Policy and Development

Research Group: FOODBIOSYSTEMS BBSRC DTP

Project ID: FBS2020-32

Application Deadline: 6 March 2020

Project Description: This is an exciting 4 year PhD studentship investigating the potential for valorization of distilled grains (DSG) as whole ingredients to be used in sustainable and nutritious plant based foods.

Distilled grain, also known as spent grain are by-products originating from the food or bioethanol industry and represent a plentiful, cheap and yet extremely valuable source of nutrients, including protein, dietary fibre and minerals. There is currently great interest in developing new capability for their valorization through upcycling i.e. their utilization as food. Wheat derived DSG are particularly interesting since they may have additional texturizing properties, which would make them extremely valuable ingredients for the development of highly nutritional, meat-free foods.

This research project aims at investigating this still unexplored potential of DSGs.

By combining different techniques from different disciplines, this project will aim at:

- Determine the composition and physico-chemical properties of wheat DSGs obtained from different plant sources.
- Characterize the microstructure of flours prepared by milling of DSG pellets and the micro and macrostructure and rheological properties of doughs produced by rehydration and mixing of these flours, with and without pre-treatment of DSG by chemical improvers or physical treatment.
- Assessment of the nutritional and textural characteristics of food matrices prepared by combining DSG-derived flours with other plant-based and/or microorganisms-derived ingredients.

The valorisation of DSG represents an important step toward making our economy more circular, to lower our environmental impact on the planet and to help meeting the growing need for sustainable plant-based protein sources. It also provides the opportunity to create novel, nutritious and tasty foods which would be affordable for consumers. The potential impact of the science addressed by this project is huge, since the outputs of this research project will tap into the growing UK flexitarian market.

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.

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: The student will benefit from training in a wide range of disciplines and techniques by undertaking the above proposed research project, ranging from biochemical analyses to rheological measurements, microscopy investigation, new product development, food reformulation and sensorial analysis

Student profile: The applicant must hold a Bachelor's (at least 2:1) or Master's degree in Food, Nutrition, Biochemistry, Plant Science or related subjects. The candidate should be eager to learn, capable of abstract thinking, resilient and innovative. Experience in analytical chemistry and/or microscopy will be an advantage. able to work within a team.