PhD Project Advertisement

Project title: Efficacy, application and consumer acceptance of plant-based proteins for metabolic health
Project No: FBS2023-12-Collins-sr

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Project description:

This exciting collaborative project offers a unique opportunity to develop multidisciplinary skills in research examining the use of plant proteins for human health. A rising global population has led to increasing demand for the supply of dietary proteins, which cannot realistically be sustained through reliance on animal proteins alone. Alongside these increasing demands on food supply, obesity and "metabolic diseases" (such as diabetes and cardiovascular disease) are now major health burdens in both developed and developing countries, directly linked to poor diet and over-nutrition. The tackling of these issues aligns with the United Nation's Sustainable Development Goals, aiming to achieve good health and well-being, and ensure sustainable consumption and production (United Nations 2017). In general, plant-based diets are more sustainable in comparison to diets rich in animal products because they use many fewer natural resources and are less taxing on the environment.

Currently, the global protein supplements market size is valued at over USD 20 billion owing to the increasing number of health-conscious consumers, with those derived from dairy by far the most common. Beyond its key role in growth, repair and maintenance, protein (mainly animal protein) has been shown to influence satiety, energy efficiency, and weight maintenance1. Yet, plant proteins can equally provide comparable protein quantity and quality and are significantly more sustainable. Most of the evidence for the additional health benefits of protein (including protein supplementation) originates from animal proteins (particularly dairy), yet the biological mechanisms may be similar for plant-based proteins.

This project is the first to comprehensively compare the energy balance and metabolic effects of plant-based versus animal-based proteins. The overall aim of this project is to provide novel insight into the effectiveness, acceptability, and specific application of plant-based proteins as a universal and sustainable alternative for weight management and metabolic health. This will comprise three interlinked studies to answer the following research questions (i) are plant proteins as efficacious as whey in terms of metabolic effects? (ii) could these metabolic effects be used during intermittent fasting to maximise protein intake and maintain lean tissue mass? and (iii) will the consumer accept it?

The project combines the disciplines of nutrition research and consumer science, harnessing and developing skills in quantitative and qualitative research. In the first part of the project, you will be responsible for developing and running an acute human diet intervention trial to fully establish the comparable metabolic effects of plant proteins. This will then lead to a longer dietary intervention trial whereby plant-based protein supplements form part of a novel intermittent fasting intervention. Specifically, a supplemented form of time-restricted eating (TRE), that we believe will be efficacious, sustainable and inclusive. Throughout the project, you will also examine how acceptable the wider use of plant-based protein supplements is to the public, including market analysis, consumer preferences, identifying key messaging and pricing, and informing new product development.

You will also be working with support from our commercial partner, Form Nutrition (Find Form Ltd). Form™ will be supporting the project through the provision of food products but also facilitating an internship as part of the project (see training opportunities).

You will be part of the vibrant research communities at both Surrey and Reading, with access to state-of-the-art facilities

and benefit from access to a wide range of training courses, workshops, mentoring and coaching.

You will be an integral part of our research community, plus play a key role with our commercial partner, collaborating and innovating together. We (Reading, Surrey and Form Nutrition) will help you make the most of your potential, removing barriers where we can and supporting you in developing your career and impact as a nutritionist of the future.

Training opportunities:

You will be fully trained in designing and running a human intervention trial, including ethical and legal requirements for research involving human participants. You will also first-hand experience in GCP and consent training, techniques for collecting and analysing blood metabolites, body composition measurement (including DEXA) and the use of indirect calorimetry. Should you wish, you can also train as a phlebotomist during this project. Across the project, you will also gain multi-disciplinary skills, such as qualitative and quantitative research methods used in consumer science. Will also be able to attend relevant undergraduate/postgraduate taught modules to strengthen their skills in specific areas.

During the project, you will also undertake an internship (minimum 3 months time equivalent) with our commercial partner, Form Nutrition. You will learn how an SME supplement company operates, and work within brand development, marketing, customer service, social media and science communication (article writing and podcasts), serving the UK and US. There will also be opportunity and support for you to develop new innovations in customer support.

Student profile:

Applicants should hold a minimum of a BSc honours degree at 2:1 level or equivalent in nutrition, dietetics, food science or a biomedical science subject relevant to nutrition. You should have a passion and enthusiasm for nutrition, consumer science and health. Clinical nutrition skills or experience in human or nutrition research is also desirable but not essential. Good oral and written communication skills are essential. Awareness and confidence in qualitative and/or quantitative consumer research methods is also desirable.

Stipend (Salary):

FoodBioSystems DTP students receive an annual tax free stipend (salary) that is paid in instalments throughout the year. For 2022/23 this will be £17,668, and this will increase slightly each year at rate set by UKRI.

Equality Diversity and Inclusion:

The FoodBioSystems DTP is committed to equality, diversity and inclusion (EDI), to building a doctoral researcher(DR) and staff body that reflects the diversity of society, and to encourage applications from under-represented and disadvantaged groups. Our actions to promote diversity and inclusion are detailed on the FoodBioSystems DTP website.

In accordance with UKRI guidelines, our studentships are offered on a part time basis in addition to full time registration. The minimum registration is 50% FT and the studentship end date will be extended to reflect the part-time registration.

References:

Rynders CA, Thomas EA, Zaman A, Pan Z, Catenacci VA, Melanson EL. Effectiveness of Intermittent Fasting and Time-Restricted Feeding Compared to Continuous Energy Restriction for Weight Loss. Nutrients. 2019 Oct 14;11(10):2442. doi: 10.3390/nu11102442. PMID: 31614992; PMCID: PMC6836017.

Williamson E, Moore DR. A Muscle-Centric Perspective on Intermittent Fasting: A Suboptimal Dietary Strategy for Supporting Muscle Protein Remodeling and Muscle Mass? Front Nutr. 2021 Jun 9;8:640621. doi: 10.3389/fnut.2021.640621. PMID: 34179054; PMCID: PMC8219935.

Bendtsen LQ, Lorenzen JK, Bendsen NT, Rasmussen C, Astrup A. Effect of dairy proteins on appetite, energy expenditure, body weight, and composition: a review of the evidence from controlled clinical trials. Adv Nutr. 2013 Jul 1;4(4):418-38. doi: 10.3945/an.113.003723. PMID: 23858091; PMCID: PMC3941822.

Berrazaga I, Micard V, Gueugneau M, Walrand S. The Role of the Anabolic Properties of Plant- versus Animal-Based Protein Sources in Supporting Muscle Mass Maintenance: A Critical Review. Nutrients. 2019 Aug 7;11(8):1825. doi: 10.3390/nu11081825. PMID: 31394788; PMCID: PMC6723444.

For up to date information on funding eligibility, studentship rates and part time registration, please visit the FoodBioSystems website.