Project Details	
Project Code	MRCPHS25Ex Torquati
Title	Greening Minds and Bodies: Assessing the physical, psychological and environmental impacts of a plant-based diet intervention
Research Theme	Population Health Sciences
Summary	Are you passionate about the intersection of health, sustainability, and behaviour change? Join our cutting-edge research project to learn interdisciplinary skills and drive real-world change! This project examines the potential benefits of plant-based diets, which have 75% less environmental impact and could prevent 24% of premature deaths. We'll explore the effects of a temporary plant-based diet plus personalised feedback on health and environmental benefits in students in catered halls. We'll examine effects on nutrition, environmental impact, physical and psychological health and assess the immediate and longer-term effects, while identifying the key challenges and enablers of adopting a plant-based diet.
Description	Large reductions in meat and dairy intake are crucial to achieving population health and climate goals. Vegan diets, with 75% less environmental impact (Scarborough et al., 2023), could prevent 24% of premature deaths (Willett et al., 2019), and increase the proportion of adults (one-third) meeting recommended fruit and vegetable intake. Governments are keen to implement policies that promote plant-based diets to meet net-zero commitments and improve population health. Changing default meals (e.g., in university catered halls) and providing personal feedback on the health and environmental impact of diets are among the most effective strategies (Onwezen et al., 2024; Frie et al., 2022). This unique project will examine the effects of a temporary plant-based diet (i.e., Vegan for one month) in students on multiple outcomes including nutritional intake, environmental impact, physical and psychological health, and attitudes. Participants will receive personalized feedback on nutrition via an app developed by our commercial partner, Fueld (https://www.fueld.ai/). As an iCase studentship, Fueld will provide access to their app and will host the student for a 3-month placement where the student will develop distinctive data analysis and app development skills. The study will evaluate the effects during a one-month intervention and at a six-month follow-up. *RQ: Does switching from an omnivorous to a plant-based diet for one month have a positive impact on nutrition, environmental impact, physical health, psychological wellbeing and attitudes towards plant-based diets? We will recruit omnivorous students in university catered halls to facilitate dietary change and standardise meal measurement. Participants will receive guidance on how to follow a plant-based diet for one month, choosing options in their catered halls (breakfast/dinner), and university food outlets (lunch). They will log their daily food intake using a smartphone app (Fueld.ai) before and after the intervention to assess adherence. The control group, from a separate catered hall, will only receive information about UK dietary guidelines (omnivorous diet). The student will work on validating and testing the feasibility of a smartphone app to capture dietary intake data, measure environmental,

physical and psychological outcomes associated with adopting a plant-based diet, and use results to engage with stakeholders to help implement lessons learnt.

Objectives and Plan:

1) Assess physical health changes: Measure glucose/lipid metabolism markers (e.g., LDL cholesterol), waist circumference, and blood pressure before and after one month of plant-based vs. omnivorous diet. Potential to extend (based on student's interest) to advanced biological markers like animal product intake metabolites and gut microbiome.
2) Compare nutritional value of a plant-based vs. omnivorous diet: Validate a smartphone app to measure and support dietary behaviour change over the month. Student can choose to use the Eat-Lancet nutrition score for planetary health or find/develop other metrics.
3) Evaluate Environmental Impact: Assess carbon emissions, water, and land use of the plant-based vs. omnivorous diets for one month.
4) Assess Psychological Wellbeing and Attitudes towards plant-based diets: Measured via online surveys before and after the month and at six-month follow-up. Utilize validated measures, including from an ongoing MRC GW4 BioMed project including liking of diet (taste), satisfaction with options available, and change in self-efficacy and identity (as a meat eater/reducer).
5) Inform Future Policy: The student will shape how to present evidence and recommendations for implementing future campus-based default meal interventions.

Students in catered halls are ideal participants as they are open to trying plant-based diets and will simply have to choose the vegetarian/vegan options (50% of the menu) during the intervention month. They will receive vouchers for lunches, and control participants will be reimbursed for their time.
We anticipate the following PhD studies that can be shaped to fit the student's interests and desired skills:
- Year 1: Prep: Conduct a scoping review, shadow researchers, and refine the PhD plan based on interests (nutrition, psychology, environment, data science). Pilot methods: Validate and gather user feedback on the fueld app for collection of dietary data and adherence measurement (e.g., Eat-Lancet score) and provision of personalised feedback.
- Year 2 - Design and conduct intervention study in students following a one-month plant-based diet vs (omnivorous) control. All measures taken at baseline and one month (post-intervention), with a subset taken at 6-months follow-up as per objectives 1-4:
    * Diet changes and adherence to a plant-based diet and macronutrients/fibre/food groups intake.
    * Environmental impact.
    * Changes in physical outcome measures (weight, blood markers, microbiome)
    * Changes in psychological outcomes (validated questionnaires)
    * Feedback on barriers/enablers.

	- Year 3/4 – Analyse samples and data, model dietary changes linked to positive health and environmental outcomes. Potentially include microbiome data for advanced data science skills. Share results with stakeholders (students, university caterers, management) to inform future policy as per objective 5.
	* 3-month placement with Fueld to check diet scoring system and test prototype of feedback on app.

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