PhD Project Advertisement

Project No/title: FBS2026 81 Weech ra / *Smart Nutrition Screening for Malnutrition, Frailty and Sarcopenia*

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Project Details

Around 1 in 10 UK adults aged 65 years and older are malnourished, meaning their diets lack the right balance of essential nutrients. Poor diets are linked to frailty and sarcopenia (loss of muscle), which affects around 25% of older adults worldwide. If untreated, these conditions can lead to declining health.

Current UK guidance recommends routine malnutrition screening in hospitals, but screening for frailty and sarcopenia is inconsistent. As a result, many cases go undetected. Earlier detection, better screening tools and effective interventions in healthcare pathways are urgently needed to reduce the health risks associated with these conditions and improve quality of life for older adults.

Also, as people move towards more plant-based, sustainable diets, it is important to understand how these dietary patterns affect older populations. Robust screening tools will help to ensure shifts in dietary behaviours do not increase malnutrition risk among nutritionally vulnerable populations.

Research aims: Research questions to be explored:

1. How is diet related to malnutrition, frailty and sarcopenia risk in older UK adults?
2. Can malnutrition risk be predicted from dietary intake data derived from biological samples?
3. What do older adults and healthcare professionals think about enhancing screening tools in care pathways?

What you will do: You will develop innovative screening approaches to identify and reduce malnutrition, frailty, and sarcopenia risk in older adults. By statistically analysing datasets, you will evidence how diet quality, protein sources, and supplement use relate to these health conditions and create machine learning models to predict frailty and sarcopenia using diet, lifestyle, and health data. Through your collaboration with healthcare professionals, this dataset will be collected from older adults awaiting orthopaedic surgery who will undergo screening and use our validated online eNutri dietary assessment tool. Supporting this, you will analyse urine and blood samples from the UK STREAM study using metabolomics to identify diet-related biomarkers of malnutrition and integrate these into predictive models. These findings will inform recommendations for enhanced screening approaches. To ensure these are practical, acceptable, and relevant, you will conduct interviews with older adults, healthcare professionals and organisations (e.g., AgeUK) to assess acceptability for incorporation into care pathways.

References:

1. Bowler et al (2024) Nutritional Screening, Initial Management and Referral for Older People with Sarcopenia or Frailty - Results from a UK-Wide Survey. J Frailty Sarcopenia Falls: 9(2):131-141. https://doi.org/10.22540/jfsf-09-131
2. Dent et al (2018) International Clinical Practice Guidelines for Sarcopenia (ICFSR): Screening, Diagnosis and Management. J Nutrition, Health and Aging: 22(10):1148-1161. https://doi.org/10.1007/s12603-018-1139-9
3. Fallaize et al (2020) The eNutri app: using diet quality indices to deliver automated personalised nutrition advice. Agro Food Industry Hi-Tech: 31 (2). https://centaur.reading.ac.uk/92698/
4. Harris et al (2019) Barriers and facilitators to screening and treating malnutrition in older adults living in the community: a mixed-methods synthesis. BMC Fam Pract: 20:100. https://doi.org/10.1186/s12875-019-0983-y
5. Houston (2017) Protein intake and incident sarcopenia in older adults: the Health ABC Study. Innovation in Aging: 1(1): 8-9. https://doi.org/10.1093/geroni/igx004.027
6. Lochlainn et al (2021) Nutrition and Frailty: Opportunities for Prevention and Treatment. Nutrients:13(7), 2349; https://doi.org/10.3390/nu13072349
7. Malnutrition Task Force: https://www.malnutritiontaskforce.org.uk/

Student profile

Essential for project: The ideal candidate will have a degree in nutrition, dietetics, food science, biomedical sciences or related subject.
Desirable for project: The candidate should have interests in laboratory work, engaging with different groups of people and developing skills in advanced data analysis methods (e.g., machine learning). Full training will be provided.
Minimum requirements for all FoodBioSystems applicants: An upper 2nd class degree (or equivalent) in a subject relevant to the project. Candidates with a lower class of Bachelors degree, but merit or above at Masters level will also be considered**.** Demonstrable skills in problem-solving, team-working, communication and time management.

Training

Project specific training opportunities: This PhD offers exceptional training across two leading institutions. At the University of Reading, you will:

- Gain expertise in malnutrition, sarcopenia and frailty screening tools
- Design and deliver human studies, including clinical trial registration and research ethics
- Gain certificications in NIHR Good Clinical Practice and MRC Good Research Practice
- Develop qualitative research skills through conducting interviews and NVivo analysis

At Aberystwyth University, you will:

- Develop good laboratory practice and biological safety skills
- Learn advanced metabolomic techniques for sample preparation and data handling
- Gain expertise in machine learning for high-dimensional datasets
- Benefit from specialist training, access to High Performance Computing and peer support for scientific computing

Both sites provide training in statistical analysis (e.g. SPSS, R), scientific writing and communication. You'll be supported to publish research and present at national and international conferences, and have opportunities to develop leadership skills (e.g., through competitive application to the European Nutrition Leadership Platform).

FoodBioSystems training opportunities: Throughout their studentship, all FoodBioSystems doctoral researchers participate in cohort training that covers four key themes: food systems, big data (data analytics and modelling), business, and research fundamentals. All doctoral researchers complete a placement: either project-related with a non-academic (CASE) partner, or unrelated to the project and outside the academic environment (PIPS). Details of training are available on the DTP website: https://research.reading.ac.uk/foodbiosystems/training/.

Project supervision style

The student and supervisory team will follow a clear and structured supervision plan to ensure adequate guidance and support are provided throughout the studentship. The lead supervisors (MW & TW) will meet the student weekly to discuss progress updates, research objectives and training plans, and will support the student with time management, goal setting and overcoming challenges. The wider supervisory team will meet monthly, offering additional project input and guidance. To facilitate ongoing reflection, the student will provide supervisors with short quarterly progress reports summarising key developments, challenges and training received, and mandatory doctoral progress reports will be completed at designated timepoints. Supervisors will provide guidance on all written work and feedback will be provided in a timely manner. To complement training received from the integrated DTP training programme, the student and supervisors will identify relevant doctoral researcher development courses to strengthen project management and their academic and research skills.

Stipend (Salary)

FoodBioSystems DTP students receive an annual tax-free stipend (salary) that is paid in instalments throughout the year. For 2025/26 this is £20,780 and it will increase slightly each year at a rate set by UKRI.

Equity Diversity and Inclusion

The FoodBioSystems DTP is committed to equity, 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 and include:

- Offering reasonable adjustments at interview for shortlisted candidates who have disclosed a disability or specific learning difference.
- Guaranteed interview and applicant mentoring schemes for applicants, with UK home fees status, from eligible under-represented ethnic groups who also meet academic eligibility criteria and the student profile essential for the project.

These are opt-in processes**.**
Our studentships can be offered to home students on a part-time basis, and studentship end date and stipend payments will be amended to reflect the part-time registration. The minimum registration for DTP funded part-time students is 0.5 FTE (studying an average of 20 hours per week over 8 years). We regret that part time registration is not available to international students due to complexities of visa restrictions.

Funding note

We welcome applications from candidates with Home/ROI fees and international fees status. This studentship is funded by UKRI and covers stipend, fees at Home/ROI rate, and research costs.
Costs that must be found from other sources or met by the individual student include:
The difference between international and Home/ROI fees at University of Reading, visa fees, healthcare surcharge, relocation costs and guarantor services.
Information about fees is available at https://www.reading.ac.uk/doctoral-researcher-college/funding/fees/fees-new-students

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