

PhD Project Advertisement

Project title: Fruit and vegetables within the current food production system and health

Project Number: FBS2022-69-Woodside-qr

Lead supervisor:

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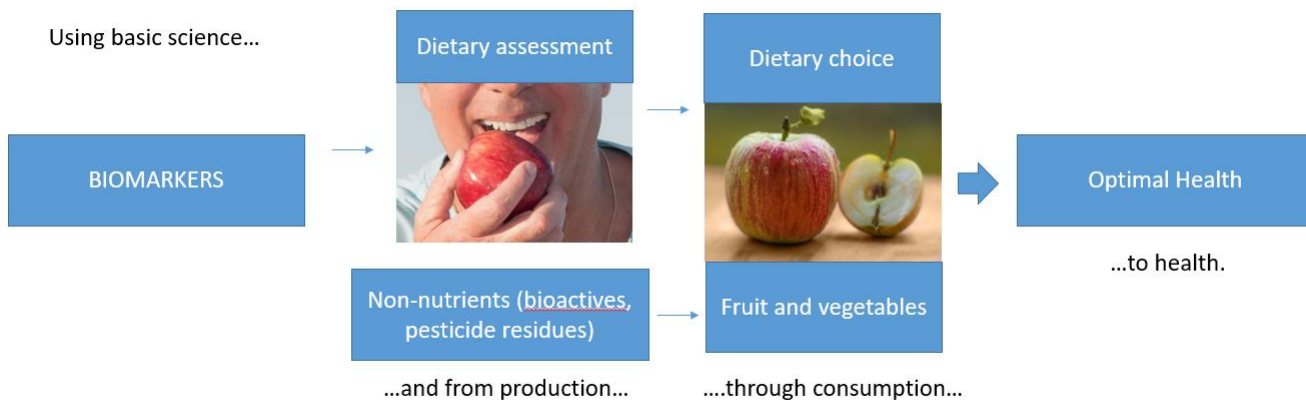
Co-supervisors:

Professor Julie Lovegrove, University of Reading

Dr. Anne Nugent, Queen's University Belfast

Dr. Colin McRoberts, Agri Food and Biosciences Institute (AFBI), Northern Ireland

Project description:



Globally, the message of fruit and vegetables or of '5 a Day' is one of the most widely promoted dietary recommendations. Beyond this, increased fruit and vegetable (FV) intake has been associated with optimal health and with reduced risk of chronic diseases such as cardiovascular disease. However, assessing dietary FV intake is compounded by many challenges. A chief challenge relates to how information about FV intake is calculated. Traditional methods used to measure dietary intakes of FV often suffer from over-reporting, whereby participants exaggerate or artificially inflate their intakes.

More recently, evidence has also suggested that the dietary method itself can influence resultant intakes. Objective novel biomarker methods may better allow the accurate assessment of usual dietary intake and relate this intake to health outcomes.

In parallel, FV are often viewed only in terms of their nutrient value rather than the totality of compounds they may contain (including bioactives or pesticide residues). There is little holistic research focusing on a food matrix effect within FV and disaggregated data on the quantities of such non-nutrients present. A final translator challenge relates to how populations behave when asked to increase FV intake. Little is known about what other dietary changes people make when increasing FV intake and whether, to some extent, these concurrent changes also contribute to the known health improvement.

Within this studentship, a series of analyses will be conducted which will address some areas of uncertainty in

the area of fruit and vegetables, dietary biomarkers and health research. Therefore, this PhD will explore:

- 1) Can measurement of targeted biomarkers help improve the dietary assessment of FV intake? (Statistical analysis of already analysed biomarker data)
- 2) What is the current bioactive and pesticide content of FV currently being consumed by UK populations, including consideration of effect of cultivar, storage and processing? (Systematic review and new food-based analysis)
- 3) What is the likely impact of differences in bioactives and pesticides observed in (2) on intake levels and health outcomes? (Modelling of pooled FV intervention studies using data from (2))
- 4) When people are asked to increase FV intake what changes do they make and how does this increased FV intake affect other food choices? (Statistical analysis of pooled FV dietary intervention studies)

Researchers in the Institute for Global Food Security (School of Biological Sciences and Centre for Public Health) at QUB and the Hugh Sinclair Unit of Human Nutrition in Reading have conducted a series of controlled dietary intervention studies where the effects of increased FV intake on a range of health outcomes have been tested and rigorous dietary records recorded. This is a rich resource which has been under-utilised to date. It is complimented by a recently completed dietary assessment method validation study, conducted with a focus on FV intake (n=100). In conjunction, researchers at AFBI have gathered considerable data and experience of quantifying bioactive concentrations in FV. Collectively this provides a unique resource to characterise the impact of increasing FV intake on biomarker expression, on dietary exposures to both positive and negative attributes and on dietary patterns.

The proposed PhD will therefore utilise already-collected data (other than targeted bioactive quantification), to address a number of research questions highly relevant to our understanding of the link between fruit and vegetable intake and human health outcomes. The project will be supervised by two nutrition researchers with an excellent track record in fruit and vegetable and health research, a third supervisor with strong expertise in dietary exposure assessments and dietary pattern analysis and a fourth supervisor, a chemical analyst, who specialises in bioactive and pesticide residue assessment, with a specific focus on FV.

Training opportunities:

This PhD will include multiple training options and the opportunity for a work placement in the USA with established collaborators in the area of environmental pollutants such as pesticide residues, as well as being co-supervised by a government agri-food research institute.

Student profile:

This project would be suitable for a student with an Honours degree in nutrition or a closely related science who has an interest in diet and health. He/she should have good data handling and statistical analysis skills, have experience of laboratory work, and be able to write to a high standard.

Funding particulars:

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