PhD Project Advertisement

Project title:
Consumption of milk and plant-based dairy alternatives: implications for nutrition, household expenditure and environmental sustainability

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Project description:
Milk is an affordable and the most nutrient-dense staple in human diets (>95% UK consumers) but dairy products are a source of saturated fats and contributes to global anthropogenic greenhouse gas (GHG) emissions. Additionally, consumers are concerned about dairy animals' health/welfare; thus stimulating the replacement of dairy foods in human diets with costly plant-based dairy alternatives (PBDAs). Such unit volume replacement may promote deficiencies in milk-based nutrients already inadequate in many UK diets, causing non-communicable diseases in vulnerable groups which are at higher risk of associated deficiencies. Nutrient-fortified PBDAs can however deliver key nourishment in those with dairy allergy and lactose intolerance, but they are expensive and they are excluded from the Government Nursery and School Milk Schemes and Healthy Start Scheme. This disadvantages socioeconomic groups in lower incomes and ethnic groups with higher intolerance rates. To resolve this, the project will quantify the effect of replacing milk/dairy products with PBDAs on nutrient balance and environmental sustainability, and develop new affordable dietary patterns for optimal human and planetary health; via the following studies: (1) nutrient balance and household expenditure implications in different demographics by unit volume replacement of milk/dairy with PBDAs, (2) environmental and socioeconomic sustainability of different consumption patterns of milk/dairy products and PBAs, (3) development of new affordable dietary patterns with milk/dairy products and PBDAs for optimal public health including vulnerable groups.

Training opportunities:
All partners will provide training on cross-disciplinary transferable skills to enhance student's future career prospects. Training includes (i) data mining and advanced statistical analyses, including linear-mixed-effects models, Shapiro-Wilko test for normal distribution, pairwise comparisons using Tukey's LSD tests (R, Genstat), principal components and multivariate redundancy analyses (CANOCO), (ii) food analysis including profiling of key nutrients (e.g. fatty acids, minerals, aminoacids and/or vitamins) by gas/liquid chromatography-mass spectrometry, and inductively-coupled-plasma mass spectrometry, (iii) nutritional modelling including linear programming dietary optimisation, logistic analytical approaches and dietary intake assessment tools. LCA training using mechanistic AgriFood systems modelling within LCA software, to account for inputs and attributional, consequential and uncertainty methods and to address human nutrition in functional units. Also,

in collaboration with the project's industry partner, the student will develop topic-relevant skills/work experience on food choices, operation/decision-making on food chain, industry data analysis, and transferable soft work-environment skills. UOR's Graduate School supports and monitors the development of generic skills (e.g. research, writing, personal, work, presentation), including a Learning Needs Appraisal (assessment of prior learning and identify/prioritise learning and development needs), and the Researcher Development Framework (personal development plan and implementation via a series of workshops/courses); as developed by Vitae.

Student profile:
This project is suitable for candidates who have at least an upper second-class degree in a related science (e.g. human nutrition, food science, animal science, biology, agriculture), and a keen interest in human nutrition/physiology, dairy science, laboratory analyses, and/or data analysis. Good skills on reviewing literature, attention to detail, time-management, organisation, teamwork and independent learning, are also required. An MSc in relevant science would be advantageous, but not essential.

Funding particulars:
The studentship is based at the University of Reading (Reading, UK) for four years and provides full funding for student stipend and tuition fees in line with the Research Council Doctoral indicative levels for 2020/2021 and research fees of up to £1,000 per annum. The project's industry partner will additionally provide £17,000 of research fees across the project. Visits to Cranfield University will take place for training purposes around LCA but these will not exceed 3 months over the duration of the project. Relevant costs for these visits have been accounted in the budget.

Other notes:
This project is part of the FoodSEqual project and 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.