TEAGASC PHD WALSH SCHOLARSHIP OPPORTUNITY
"Digital Milk Map"

Background

The PhD Walsh Scholarship is part of target project 7 of the VistaMilk SFI Research Centre 'Milk by Design'. The VistaMilk SFI Research Centre is a unique collaboration between Agri-Food and information communications technology (ICT) research institutes and leading Irish/multinational food and ICT companies. It is funded by Science Foundation Ireland (SFI) and the Department of Agriculture Food and the Marine (DAFM). The centre is hosted by Teagasc, in partnership with the Tyndall National Institute, Ireland's national microelectronics institute, the Telecommunications Software & Systems Group (TSSG) at Waterford Institute of Technology, and the Insight Centre for Data Analytics and University College Dublin.

Ireland has a seasonal milk supply influenced by changing weather, soil nutrition, and other environmental/societal factors. The primary changes that occur in milk across a season are compositional, for example, variation in protein, fat, lactose and mineral constituents. Milk composition ultimately determines the type and yield of Dairy products produced; including processing characteristics that are responsible for functionality and end use application as either a consumer food or ingredient in another food. This Scholarship will combine spectroscopy, data analysis and mathematics to predict of milk technological traits from mid-infrared spectroscopy analysis in dairy cows in real-time at the farm level. Mid Infra-red based compositional analysis of milks from different locations across Ireland will correlated with standard (wet chemistry) based techniques used in the Irish Dairy Industry. Algorithms will be developed for determination / prediction of milk processability based on correlation of compositional and functionality data. The aim is to develop a Digital Milk Map, accessible via web or phone app, capable of predicting changes in milk composition and functionality across Ireland with a high level of accuracy. The data will be presented in the form of a "Milk map" geovisualisation, which will layer the variables of interest over a map of Ireland, identifiable by milk catchment area specific to each processor. This web-based data visualisation system will allow users to interactively explore aspects of milk composition and functionality at scale. Predictions integrating historic milk quality data, along with additional information from a range of relevant sources (e.g. genomics, weather data, soil nutrition). The predictive modelling algorithms developed here will be continually updated to include application for a range of Dairy product streams within the Irish Dairy Industry. Ultimately, if a Dairy processor can predict how the nutrient content of milk varies during a season, then it is conceivable that processing parameters can be adjusted in advance to potentially off-set potential processing and/or quality issues.

Requirements

Applicants should have a First or Upper Second-Class Honours BSc. degree in Food Science, Nutrition, Agriculture or a related discipline. The successful candidate should be self-motivated with enthusiasm to develop technical skills across a range of disciplines including chemistry, spectroscopy, data analytics, and statistics and/or chemometric techniques. Spectroscopic techniques (MIR / NIR) will be used produce profiles of milk composition which can be related to functionality and milk processability. The successful candidate will also be expected to take part in wider VistaMilk activities (annual conference, relevant Masterclasses and workshops, Education and Public Engagement activities…). A minimum level of competency in English is required. Please see the following link with regard to English Language requirements:

https://www.ucd.ie/registry/prospectivestudents/admissions/policiesandgeneralregulations/generalrequirements/minimumenglishlanguagerequirements/

Award

The Scholarship funding is €24,000 per annum and includes University fees of up to a maximum of €5,500 and student stipend at a flat rate of €18,500 per annum and is tenable for 4 years.

Further Information/Applications

The Scholarship will be based on a day-to-day basis at the Teagasc food research centre, Moorepark with University College Dublin as the academic partner. The student will ultimately graduate from UCD.

Application Procedure

Submit an electronic copy of your curriculum vitae and a letter of interest with names and emails of two academic references to: Dr Mark Fenelon at mark.fenelon@teagasc.ie and Dr Derek Greene at University college Dublin at derek.greene@ucd.ie.

Closing date 30th April 2020