



From Farm Gate to Market: Decision-Support Tool for Optimisation of Dairy Processing

Walsh Scholars Reference Number: 2026021

University: University College Cork (UCC)

Funding: Teagasc

Research Institution: Teagasc

Location: Teagasc Moorepark, Co. Cork

Proposed Start Date: September 2026

Project Description

This PhD will contribute to the development of a decision-support model within the [Vista Milk](#) programme to optimise the movement of Irish milk from farm to finished dairy products. The research addresses challenges arising from variability in milk composition and market volatility, which complicate short-term processing decisions and longer-term capacity planning in the dairy sector.

The project will develop and link validated sub-models representing milk collection, transport, intake, processing, storage, and distribution. These components will be integrated with farm-level production models and market price and demand forecasts to support informed decision-making across the supply chain. A further objective is to deliver a flexible, site-specific user interface that enables portfolio optimisation and scenario testing by industry users.

The research will address key questions around how processors can maximise value from variable milk supplies under uncertain market conditions, how production forecasts can be combined with market signals, and how improved information flow between farms and processors can enhance predictive accuracy. The methodology will combine model development and integration, stochastic and multi-objective optimisation, market forecasting approaches, validation using industry data, and user-centred interface design.

The project will deliver practical tools to support improved product portfolio decisions, more robust investment planning, and stronger farm–processor feedback, enhancing the resilience and competitiveness of Ireland’s dairy sector.

Supervision

The project will be supervised by Dr Eoin Murphy (Teagasc), whose expertise in dairy processing and process engineering will guide the development and integration of processing models. Co-supervision will be provided by Dr Huanhuan Xiong (University College Cork), bringing expertise in business information systems and computer science, with responsibility for optimisation methods and user interface development. Professor Thia Hennessy (University College Cork), Head of the College of Business and Law, will contribute expertise in agri-food economics, supporting the economic and market analysis components. Together, the supervisory team integrates engineering, computational modelling, and agri-food economics, providing a strong and complementary framework for the project.

Research Environment

You will be registered at University College Cork and based at the Teagasc Food Research Centre, Moorepark, a centre of excellence for dairy science, processing, and systems research, for the duration for your studies. The project offers access to state-of-the-art pilot-scale processing facilities, advanced data and modelling infrastructure, and a strong interdisciplinary research community.

As a Walsh Scholar, you will benefit from engagement with national and international research networks, regular seminars, and opportunities to collaborate with researchers across dairy processing, engineering, data analytics, and agri-food economics.



Career and Training Opportunities

The Teagasc Walsh Scholars Programme provides a structured four-year training and development framework designed to support both academic excellence and long-term career readiness. Scholars develop advanced scientific and analytical expertise alongside transferable skills in communication, project management, and stakeholder engagement through expert-led training, workshops, and tailored professional development.

Opportunities are provided to present research at national and international conferences, supporting professional networking and active engagement with the wider research community. Dedicated final-year career supports focus on preparing scholars for impactful roles across research, industry, advisory services, and policy, in Ireland and internationally.

Through the Teagasc International Training Awards, scholars may undertake an international research placement of up to 12 weeks aligned with their PhD project. Outstanding achievement may also be recognised through the Walsh Scholars of the Year and Gold Medal Awards.

Candidate Profile and Eligibility

Applicants should ideally:

- Hold a First or 2.1 Honours degree (or Master's) in operations research, business analytics, data science, computer science, food science, agricultural or food engineering, systems engineering, or a related discipline
- Demonstrate strong analytical and problem-solving skills
- Show proficiency in Python for predictive and prescriptive (optimisation) modelling
- Demonstrate the ability to apply multidisciplinary approaches to hypothesis-driven research
- Possess strong written and verbal communication skills and the ability to work effectively as part of a team
- Meet UCC postgraduate entry requirements, including English language requirements where applicable
- Experience in dairy processing, machine learning, or the development of decision-support tools would be advantageous but is not essential.

Funding Details

This is a fully funded four-year PhD funded by Teagasc, including:

- €25,000 annual stipend
- University fees covered up to €6,000 per annum

How to Apply

Applicants should complete the [online application form](#) by **5:00pm on Wednesday, 18 March 2026**. Applications must include a curriculum vitae and a 1–2 page statement of motivation submitted as part of the online application.

Interviews

Shortlisted candidates will be invited to interview in **early to mid-April 2026**. Online interviews can be accommodated.

Further Information

Informal enquiries are welcome and may be directed to: Dr Eoin Murphy – Eoin.Murphy@teagasc.ie



Further information on the Walsh Scholars Programme is available at:

<https://www.teagasc.ie/about/research-innovation/the-walsh-scholars-programme/about-the-programme/>