

Walsh Fellowships Programme winners 2018

This year's Walsh Fellowship seminar celebrated the 25th anniversary of the Teagasc postgraduate Programme.

The Teagasc Walsh Fellowships Programme is a postgraduate programme offering fellowships to graduates to undertake research in agriculture, food, environmental science, agri-food economics, rural development, horticulture, and other related disciplines. The programme has grown significantly over the years; there are currently 280 Walsh Fellows, with an annual investment of €6m. You can read more about the programme and some of the alumni in the publication 'Celebrating 25 years of Postgraduate agri-food research 1993-2018' included with this issue of *TResearch*. Each year Teagasc organises a seminar to provide Walsh Fellowship students in their final year with the opportunity to communicate and present their research to a general audience, and network with academics and researchers in the agri-food industry. This year we held a competition in each of the programme areas and the best student was selected to go forward to the annual seminar in Johnstown Castle. We would like to thank all of the Walsh Fellows who participated in the competition and congratulate each of the winners, who have provided a brief description of their research below. For more information on the Teagasc Walsh Fellowships Programme and the opportunities available, see www.teagasc.ie.

Eoin O'Connor

Crops, Environment and Land Use Programme Overall Winner of the Walsh Fellowships Seminar

Eoin is based at Teagasc Ashtown, and is supervised by Helen Grogan, Teagasc, and David Fitzpatrick, Maynooth University. Thesis title: 'Genomic, transcriptomic, and proteomic analyses of *A. bisporus* strains showing some resistance/tolerance to mushroom virus X'. The mushroom industry is Ireland's largest horticulture sector, with exports worth over €100m. Since the early 2000s, mushroom production has been negatively impacted by a collection of viruses

known as mushroom virus X (MVX). Not much is understood about the interaction between these viruses and the mushroom host or how they cause damaging symptoms, such as the brown and poor-quality mushrooms associated with *Agaricus bisporus* virus 16. To advance our knowledge in this area, my research examines the gene expression and protein synthesis response of five different strains of *A. bisporus* when infected with viruses in a semi-commercial setting. The results of this work will inform international breeding research in the development of virus-resistant mushroom strains that would reduce losses caused by viruses in the future.

Áine O'Brien

Animal & Grassland Research and Innovation Programme Winner

Áine is based at Teagasc Moorepark and is supervised by Donagh Berry, Teagasc, and Seán Fair, University of Limerick. Thesis title: 'Genetics and genomics of performance in a multi-breed Irish sheep population'.

Breeding goals, whatever the species, must include all traits of importance; moreover, accurate differentiation of genetically elite from inferior individuals is paramount. The objective of this thesis was to develop and deploy the statistical know-how and pipelines for accurate genetic evaluations, using sheep health as a test case. Three health traits were considered (dagginess, lameness and mastitis) and it was concluded that up to 15% of the variability in these traits was due to inter-animal genetic differences. Mathematical strategies underpinned the construction of a bespoke Irish sheep genotyping platform, created to fulfil multiple purposes, while retaining the accolade of the lowest-cost medium-density sheep genotype platform globally. Results contributed to the now-deployed national sheep health index and a low-cost medium-density genotype platform, optimised for Ireland, but available worldwide.



Eoin O'Connor,
overall winner.



Áine O'Brien.



Orla Power.



Sharon Ní Bheoláin of RTÉ with
Teagasc Director Gerry Boyle.



Amy Connolly.



Amar Daxini.

Orla Power

Food Programme Winner and Winner of the IFSTI Medal

Orla is based at Teagasc Moorepark and is supervised by Noel McCarthy, Teagasc, and James O'Mahony, UCC. Thesis title: 'The effect of drying parameters and composition on hydration characteristics of high-protein dairy powders'.

High-protein milk powders are of great commercial importance to the Irish dairy industry. However, they are not readily soluble, which results in flecking in rehydrated products. Adding calcium chelators to high-protein powders increases protein solubility; however, there is a significant increase in viscosity. This causes fouling in membrane filtration systems and spray dryers, resulting in plant downtime and financial loss. We employed transglutaminase to enzymatically crosslink milk proteins. This modification resulted in lower viscosity products, improved rehydration behaviour and contributed to retaining the milk's whiteness. This work addressed key concerns associated with high-protein powders through cost-effective, industrially applicable means, while maintaining protein structure and lending insight into protein interactions with calcium chelators.

Amar Daxini

Rural Economy and Development Programme Winner

Amar is based at Teagasc Athenry and is supervised by Mary Ryan, Teagasc, and Andrew Barnes, Scotland's Rural College (SRUC). Thesis title: 'Understanding farmer decision making in relation to nutrient management planning to improve knowledge transfer methodologies'.

My research aims to understand the factors that influence farmers to adopt and use nutrient management planning practices. In particular, I am interested in the use of soil test results and nutrient management plans (NMPs) to inform nutrient management decisions on farm. Use of such practices has been proven to have benefits in terms of the environment but also in terms of profitability. However, adoption remains below expectations across all farm systems both in Ireland and globally. By understanding such factors,

policy makers can use this information to inform initiatives designed to encourage further use of nutrient management planning and further target such initiatives where appropriate.

Amy Connolly

Knowledge Transfer Programme Winner

Amy is based at the Teagasc Advisory Office in Moorepark and is supervised by Pat Murphy, Teagasc, and Anne Markey, UCD. Thesis title: 'Using nutrient management plans (NMPs) to deliver soil fertility advice'.

NMP Online is a system developed by Teagasc to create NMPs for environmental and regulatory purposes. My research involves an analysis of the system using focus groups and interviews. The main objectives are to determine the attitudes, opinions and impediments to the use of NMP Online by advisors and farmers, and to develop future requirements. Food Harvest 2020 and Food Wise 2025 both identified nutrient management as an area that needs to be improved. At the last renewal of our nitrates derogation, EU Commission officials raised concerns about our water quality. Nutrient management on farms must be improved through nutrient management planning to try to improve our water quality, as our nitrates derogation will be at risk otherwise. If we improve the system, we should improve the NMPs produced and nutrient management overall.

Author

Jane Kavanagh

Head of Research Operations, Teagasc, Oak Park, Carlow
jane.kavanagh@teagasc.ie

