Ritika PURI

Technology Centre: Dairy Processing Technology Centre (DPTC), University College Cork (UCC)
Academic Mentor: Dr. Seamus O'Mahony
Commercial Partner: Lakeland Dairies, Ireland
Commercial Mentor: Upendra Singh

Ritika received her bachelor's degree in 2010, from Shaheed Rajguru College of Applied Sciences for Women, University of Delhi, India. In 2010 she started her master's degree at Guru Nanak Dev University, Punjab, India, focusing on the effects of acacia gum, salt and sugar on the physical properties of lotus stem starch. In 2012 Ritika started her doctoral degree at the National Dairy Research Institute, India, performing studies on characterization, standardization of technology and shelf-life of cham-cham (a traditional Indian milk product).

Dr. Seamus O'Mahony

Dr. O'Mahony graduated from UCC with a BSc in Food Science and a PhD in Food Science and Technology in 2001 and 2005, respectively. Presently a lecturer in Food Science, after a number of international industrial research and development positions, working at the interface between Research & Development, Product Development and Operations.

Upendra Singh

Upendra Singh is the R&D lead at the Food Ingredients Division of Lakeland Diaries. He has 12 years' experience in research, innovation, strategic business development and management of various industrial and academic collaborative projects with research organisations in Ireland (e.g., UCC, Teagasc, DPTC), and key customers in West Africa, Middle East, Asia and the US.

Dairy Processing Technology Centre (DPTC)

The Dairy Processing Technology Centre is an industry-academic collaborative research centre, hosted by University of Limerick, with a research agenda driven by the long-term growth opportunities for the dairy sector. The Centre will help to fuel growth in the Irish dairy sector by performing research focused on cost-efficient processing, facilitating a step-change in environmental sustainability and creating, validating and commercializing a pipeline of science and technology-based manufacturing platforms for dairy ingredients.

Lakeland Dairies

The vision of Lakeland Dairies is to achieve long term success and prosperity for dairy producers throughout the northern half of the island of Ireland. They will achieve this continuously by identifying and meeting the needs of their customers, competitively and cost efficiently, with wholesome, natural produce of the highest attainable quality. They will underpin this with a strategic focus on research and development, an unparalleled commitment to reliability and consistently high performance across all operations. In setting these objectives, Lakeland Diaries will have maximum regard for the sustainability of the environment in which they operate, while also ensuring the strictest conditions of quality and traceability in all raw materials used.

Ritika's project

"Development of super-premium membrane filtered milk protein ingredients with enhanced quality and functional properties for nutritional applications (PREMPRO)"

The project will focus on the development of sustainable processes for the manufacture of novel dairy protein ingredients for premium applications like medical, clinical and infant nutrition products. The research project will develop greater understanding of the interactions and fractionation of milk constituents during membrane filtration, impact of processing and storage on quality and functionality of the ingredients and applicability of the ingredients in such premium applications.

Dairy ingredients such as milk protein concentrates and isolates are rich sources of dairy protein and are manufactured by removal of lactose and minerals naturally from milk using clean filtration technology. However, the high protein content of these ingredients can result in manufacturing challenges during their industrial production such as high viscosity of concentrate before drying as well as functionality issues during storage of the liquid products (e.g., UHT-treated clinical nutrition drinks) containing these ingredients causing sedimentation, gelation and thickening.

Additionally, there can be changes during storage, leading to deterioration in organoleptic properties of the products, such as protein hydrolysis, due to the action of milk enzymes giving rise to bitter tasting drinks. These enzymes are heat stable and survive the processing temperatures and may exist in protein ingredients making their way into the final product. Therefore, the project aims to create innovative processing strategies for the manufacture of premium dairy protein ingredients that will result in superior tasting, highly nutritious, protein-rich products with greater physical stability and adding value to Ireland's milk pool.