



Your Research Partner for Photonics Solutions

CENTRE FOR
ADVANCED PHOTONICS
& PROCESS ANALYSIS

CAPPA

Innovation Through Light

Photonics for Dairy

Application Case Study

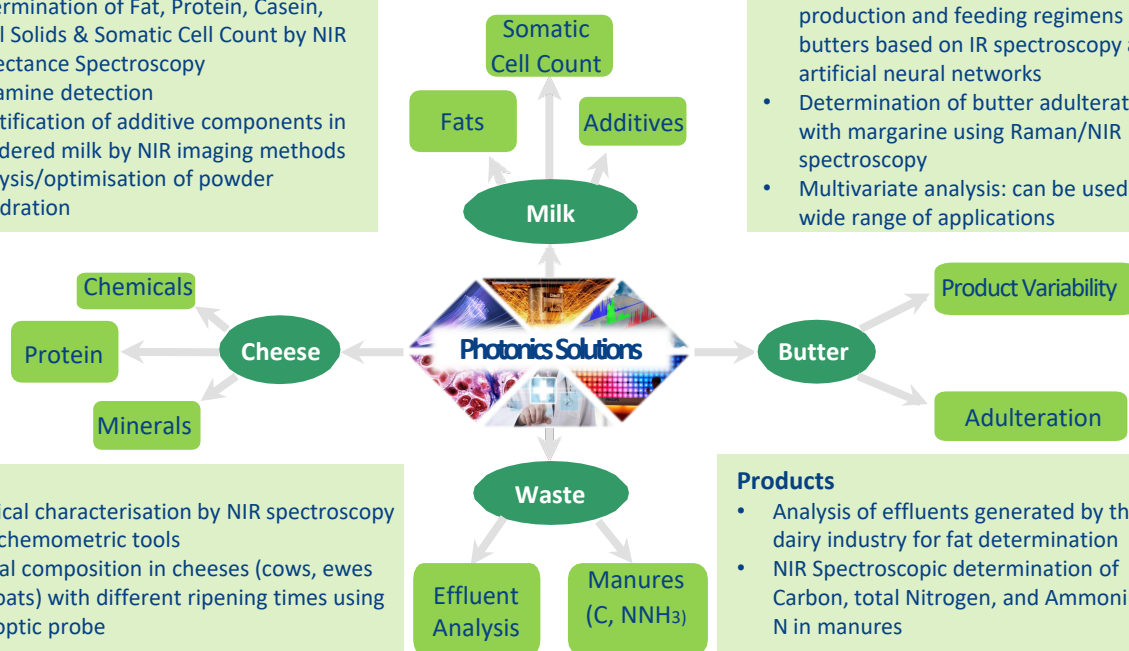
Global milk production is expected to exceed 1000 million tonnes by 2025 and is an important part of Ireland's Agri-Food sector; the Irish dairy industry exports 90% of its production to over 140 countries, valued at €3.1 billion. Photonics can, and does, provide a range of invaluable solutions to the dairy industry:

Milk

- Determination of Fat, Protein, Casein, Total Solids & Somatic Cell Count by NIR Reflectance Spectroscopy
- Melamine detection
- Identification of additive components in powdered milk by NIR imaging methods
- Analysis/optimisation of powder rehydration

Butter

- A rapid method to discriminate season of production and feeding regimens of butters based on IR spectroscopy and artificial neural networks
- Determination of butter adulteration with margarine using Raman/NIR spectroscopy
- Multivariate analysis: can be used for a wide range of applications



Cheese

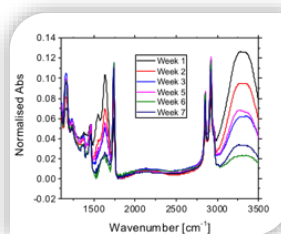
- Chemical characterisation by NIR spectroscopy using chemometric tools
- Mineral composition in cheeses (cows, ewes and goats) with different ripening times using fibre-optic probe

Products

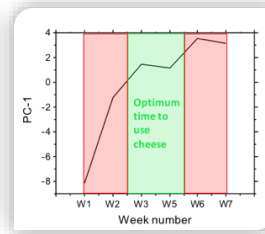
- Analysis of effluents generated by the dairy industry for fat determination
- NIR Spectroscopic determination of Carbon, total Nitrogen, and Ammonium-N in manures

Innovation Voucher Case Study: Maturity Cycle of Processed Mozzarella Cheese

A pizza company approached CAPPA to develop a quality control test for mozzarella cheese, availing of a €5,000 **Enterprise Ireland Innovation Voucher**. The problem was an issue with the cheese burning during pizza preparation depending on the maturity of the cheese. CAPPA gathered 8000 NIR spectra over 7 weeks, and used **Chemometrics** (Principle Component Analysis) to develop a model to identify the current maturity of the cheese, and hence determine the optimum cheese maturity point.



NIR Spectra of Mozzarella



PCA model of maturity cycle



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