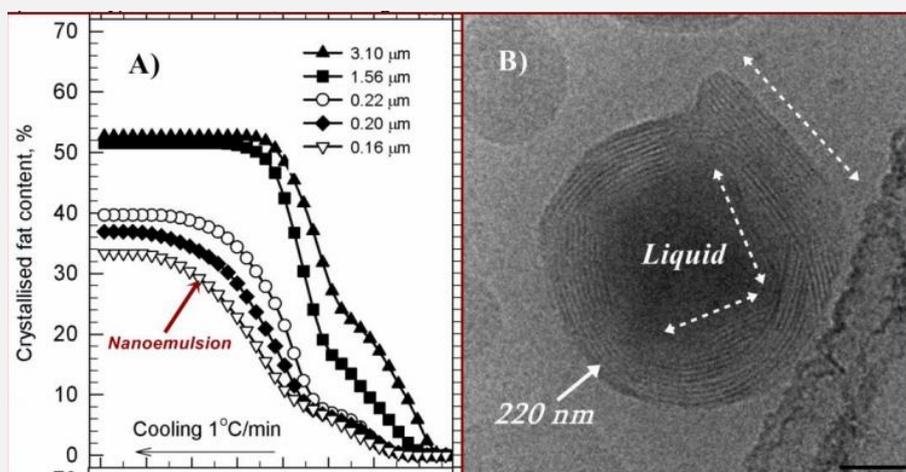


# ARC Dairy Innovation Hub – Research Themes

## Ingredient Innovation

The *Ingredient Innovation* theme, led by Professor Bhesh Bhandari from the University of Queensland, focusses on using innovative processing technologies to create dairy ingredients with new and enhanced functionalities. Nano-emulsion and micro-emulsion technologies will be used, in conjunction with milk fat fractionation, to develop new types of dairy lipids and emulsions with highly specified physical functionality, designed to out-perform traditional dairy fats in high-value applications. Novel processes show promise to modulate the crystallisation behaviour and emulsion stability of dairy fats and fat fractions. This theme will also develop higher-value ingredient applications of fractionated dairy proteins, including casein and whey protein fractions derived from both centrifugation and membrane filtration. Studies will be extended to manufacturer sites. To complement research in the *Process Innovation* theme, the chemical or biochemical treatment of acid whey will be also be evaluated.



*Within the Ingredient Innovation theme, the first part of the project will explore different properties of emulsions of dairy fat:*

- Influence of emulsions size on the crystallisation of fat, effect on fat losses, functionality and sensory properties of dairy products
- Influence of crystallisation modifiers on properties of milk fat products

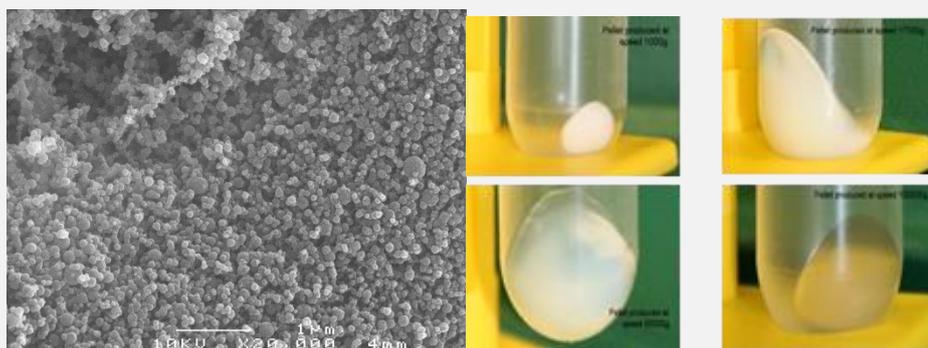
*The second part of the project will explore:*

- size fractionation techniques for casein micelles
- functionality of milk comprising of fractionated casein micelles

*The third part of the project will explore:*

- properties and processability of acid whey
- development of lactic acid removal techniques

Top: Crystallisation property (left) and crystal structure of nano-size fat particles (right)\* Below: Casein micelles in milk (left) and size fractionated casein micelles\*\* (right). \*Truong (2014); \*\*Ha (2014). PhD Thesis. UQ (work funded by DIAL)



### Key Collaborations with other Hub projects

The UQ Ingredient Innovation team will closely collaborate with DIAL and its industry partners, with the UQ Tribology and sensory projects and later with the UoM team.

### Contact

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