



## Use of Hydrate Filtration Technology in the Dairy Industry

The University of Queensland has developed a new high-flux filtration and separation technology based on hydrates. This opens up new possibilities for the dairy industry, in particular it enables the:

- ✓ **Production of milk powder without heating**
- ✓ **Separation of fats, casein and whey proteins**

### Rapid Separation of Fats/Casein and Water/Whey Protein



Milk before Filtration      Filtrate with Whey      Separated Fats/Casein

Milk Retentate ready for drying

Separated Milk Fats and Casein

*Gravity and pressure-assisted Hydrate filtration of milk*

Milk powder produced by current evaporation and heat drying processes, such as spray and drum drying, has a cooked flavour due to caramelisation caused by heat exposure. Many valuable nutrients may be lost. Milk is a potentially interesting liquid for hydrate filtration as it contains milk fat as an oil-in-water emulsion and protein as casein and whey. Using milk for hydrate filtration resulted in a thick creamy paste containing milk fat and solids that could be easily dried to powder using air

blowing. Water-soluble compounds, including lactose and whey protein pass the filter. It should be assessed whether hydrate filtration could complement and expand existing processes in the dairy industry. As whey proteins are more water-soluble than casein, hydrate filtration could potentially be used to separate both protein fractions. An application for various countries can be envisaged where fresh milk may need to be processed quickly to powder to prevent spoilage.

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**UQ Research into the Hydrate Membrane is mid stage –TRL 3-4. In order to progress further towards commercial application, the researchers seek commercial partners to collaborate with to test application of the membrane in numbers industrially and consumer relevant scenarios.**