

Project number: 6723

Funding source: Enterprise Ireland/Industry

Date: March 2017

Project dates: Dec 2014 – Feb 2017

Evaluation of technological options for processing of milk fat into value-added



Key external stakeholders:

Agri-food industry, Milk processors, Scientific community, Ingredients companies

Practical implications for stakeholders:

The project produced an updated and extensive review on milk fat production, processing and research landscape.

- Identification of available technologies for commercial processing of milk fat.
- Presentation of information to industry partners.
- Facilitate joint academic-industry collaborations and projects.
- Provide fact-based decision-making platforms on future needs, direction and scope of milk fat processing.

Main results:

Provision of report and peer-reviewed article on:

Factors affecting milk fat composition.
Milk fat utilisation and processing.
Valorisation and diversification of milk fat.
Novel processes and technologies.
Market trends, production and trade.
Nutrition and health implications of milk fat consumption.
Future research.

Opportunity / Benefit:

State-of-the-art review on milk fat production, processing and value-addition.

DPTC report and peer-reviewed publication. Expertise available at Teagasc (Dr. Sean Hogan).

Collaborating Institutions:

Dairy Processing Technology Centre

Teagasc project team:

Dr. Sean Hogan (PI)
Dr. Maneesha Mohan
Dr. Phil Kelly

External collaborators:

DPTC Industry partners

1. Project background:

It is projected that ca. 35 million tonnes of milk fat will be produced globally by 2025. This surplus, enhances the need for diversification of milk fat products and the milk pool in general. Developments in milk fat research and processing have remained largely static in recent years. This work describes current production and uses of milk fat and seeks to identify opportunities for further exploitation of this valuable commodity.

2. Questions addressed by the project:

How can surplus milk fat be utilised and valorised?

To what extent can the composition and functionality of milk be controlled?

Can emerging technologies improve the nutritional and functional qualities of milk fat?

Is negative public perception of milk fat consumption and health justified?

3. The experimental studies:

Detailed examination of scientific literature and market statistics.

Fact-finding meetings with DPTC industry partners.

Discussions with national and international milk fat processors and equipment manufacturers.

4. Main results:

The work has provided detailed insight into:

Factors affecting milk fat composition – effects of diet on fatty acid profile and milk fat functionality.

Trends in milk fat utilisation and processing.

Valorisation and diversification of milk fat.

Novel processes and technologies including ultrasound, high-pressure processing, supercritical fluid extraction and fractionation.

Detailed statistics on international markets, production and trade,

Re-assessment of milk fat consumption and health – collation of current epidemiological evidence and medical opinion.

Identification of future research options.

5. Opportunity/Benefit:

Description of efficacy of dietary intervention as tool to modify milk fat composition and functionality.

Promotion of Irish grass-fed pasture systems as source of high-quality milk fat products.

Advancement of knowledge on milk fat production, processing, applications and end-user benefits.

Positive health implications to benefit marketing of milk and milk fat products.

6. Dissemination:

DPTC International Advisory Board Review 2018

Multiple industry visits, discussions and presentations.

Contribution to international conferences.

Main publications:

M.S. Mohan, T. F. O'Callaghan, P. Kelly and S.A. Hogan. (in press). 'Milk Fat – opportunities, challenges and innovation'. *Comprehensive Reviews in Food Science and Nutrition*.

M.S. Mohan, P. Kelly and S.A. Hogan. 'Milk fat enrichment, fractionation and functional modification - Need for value addition'. (2018). *International Union of Food Science and Technology (IUFoST)*, Mumbai.

M.S. Mohan, P. Kelly and S.A. Hogan. 'Milk Fat–global production, nutrition and research perspectives'. (2017). Mohan et al. *Society of Dairy Technology*, Spring Conference, UCC, Cork.

7. Compiled by: Sean Hogan