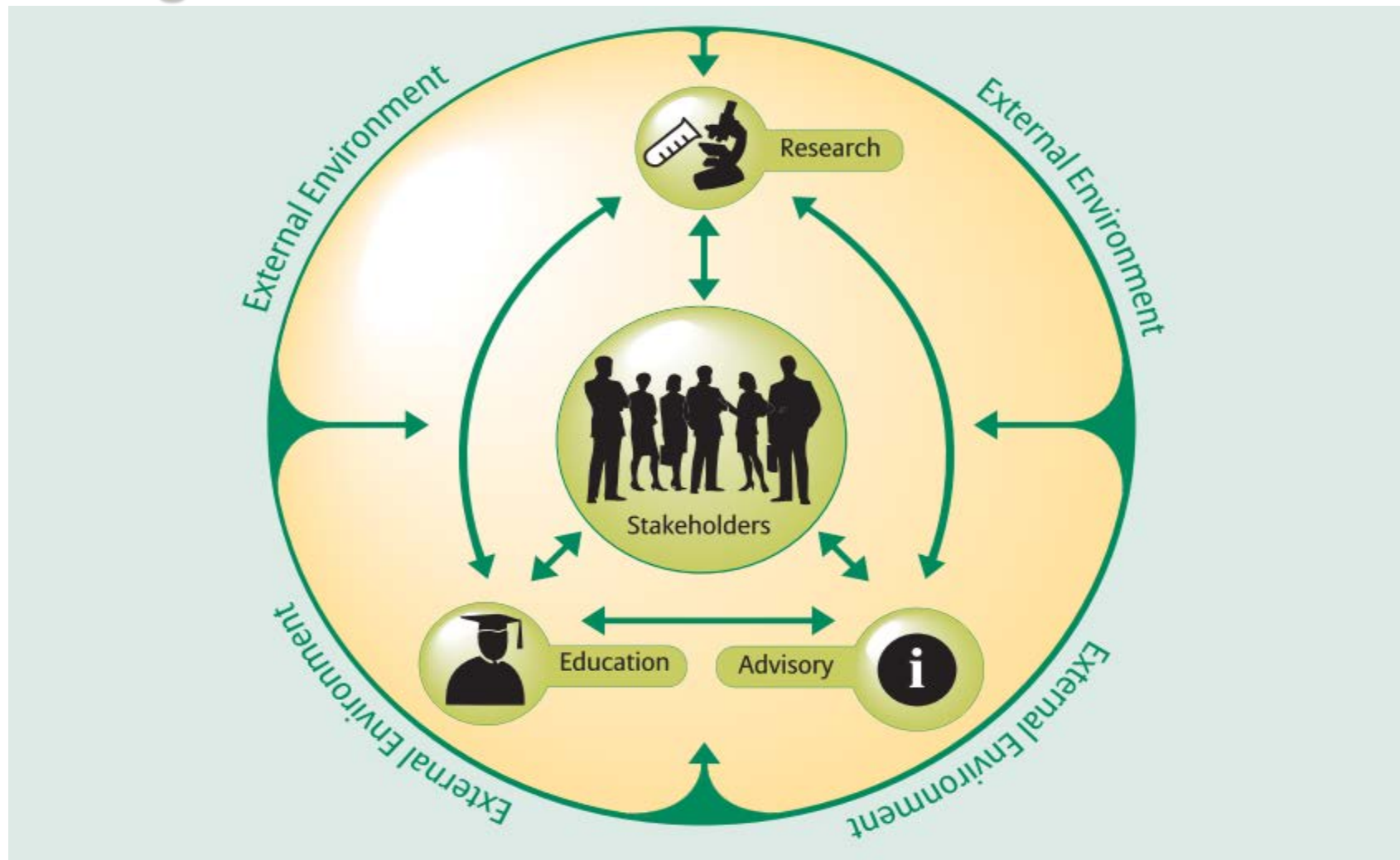
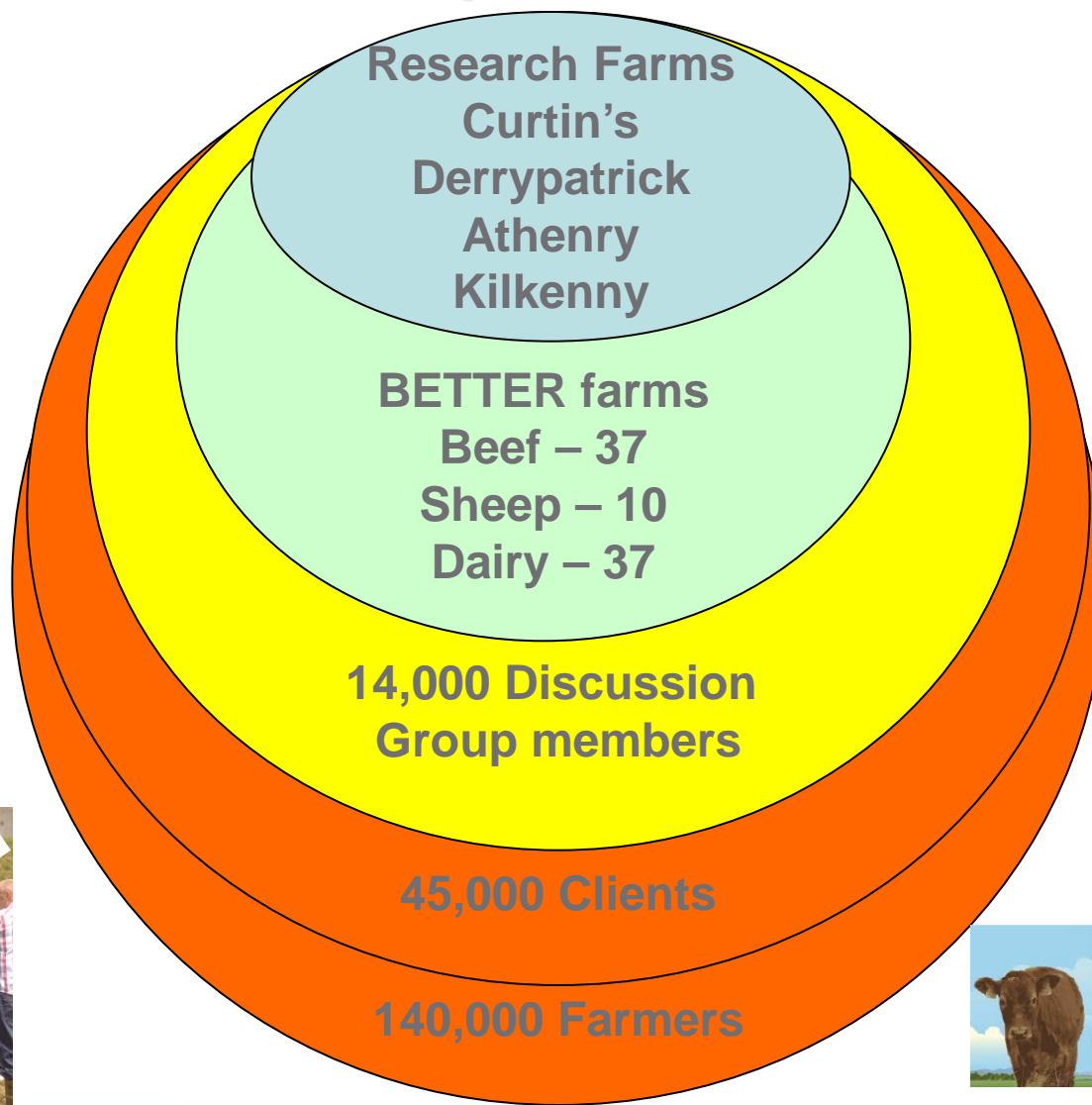


Teagasc AKIS



Research and extension operational model





Technologies for the Food Industry



Portfolio

Technology for the Food Industry



OFFERS



EXPERTISE



UPDATES



SERVICES



PROFILE

Novel Technology for the Manufacture of Gluten-free Ingredients and Products

Teagasc researchers are seeking commercial partners interested in evaluating and further developing this process technology and related know-how for the manufacturing of high quality gluten-free ingredients and products.

Summary

Teagasc has developed novel dairy ingredients which provide similar properties and functionality to gluten. The gluten-free ingredients are suitable for dough based systems; therefore products can be manufactured using standard production lines.

Companies interested in developing a range of gluten-free products are invited to discuss this technology.

Problem Addressed

Gluten is a protein found in wheat, rye, barley and oats. People who suffer from coeliac disease cannot eat foods containing gluten. It is responsible for network formation in batters and dough and contributes to the texture and crumb structure of many baked products. Current legislation limits gluten levels in gluten-free products to 20ppm. While there are a number of gluten free products on the market, the quality of the products need to be improved, and many products are not suitable for use in standard production lines.

Solution

Researchers at Teagasc have recently developed a dairy-based ingredient which can provide the same functionality as gluten in gluten-free breads and confectionery. It is also suitable for use in pre-mixes and in gluten-free flour.

Competitive Advantage of Technology

1. The gluten-free ingredients are designed for use in a dough based system, so can be used in standard production lines.
2. The texture of the bread is comparable to gluten breads.
3. The functionality of the dough can be varied for different applications, e.g. sliced bread, pizza bases, rolls, baguettes, bagels, confectionery etc.

Opportunity

In 2001, the US gluten free market was valued at \$210m, and has grown at 27% per annum reaching \$696.4m in 2008. In the UK, the market for gluten-free products in 2007 was valued at £74 million, (Mintel, October 2007). The gluten-free category in the UK is currently 41% of the total 'free-from' food and beverage market, marginally lagging the dairy-free market (Heller). The market is estimated to continue to grow at around 20-25% pa. Similar trends are observed in Ireland.

Intellectual Property Status

Proprietary know-how which can be licensed on a non-exclusive and exclusive basis.

Funding



How to Proceed:

For further information contact:

Miriam Walsh
Tel: +353 (0)59 9183477
Email: miriam.walsh@teagasc.ie

Characterisation and Enrichment of "Buttermilk" Fat Globule Membrane Composition Using Novel Technologies

Key External Stakeholders:

Dairy processors, butter manufacturers, ingredient innovators.

Practical Implications for Stakeholders:

This project has demonstrated that the milk fat globule membrane (MFGM) residue contained within buttermilk possesses biological activity and offers potential for greater commercial exploitation and adding value.

A key implication for dairy producers and processors is a realisation that buttermilk as a by-product of buttermaking is presently under-utilised through processing into a relatively low-value commodity buttermilk powder.

- Expertise and analytical capability were developed, in relation to bioscience aspects and technological features of MFGM, which is key to understanding the fate of MFGM proteins and phospholipids during processing.



- Specific analytical capabilities developed during the project were made available to interested dairy processors thereafter to enable them to characterise the composition of buttermilk and MFGM fractions generated by their processes. This, in turn, led to international food and nutritional company reaction e.g. expressions of interest on the part of infant milk formula manufacturers.

Main Results:

- Analytical techniques were established which enabled, for the first time, the fate of MFGM proteins and phospholipids to be tracked during processing simulations performed on freshly-produced milk.
- MFGM proteins are partitioned mainly into buttermilk during cream churning, some of these proteins were also detected in the resulting butter. All major MFGM phospholipids, i.e. PE (phosphatidylethanolamine), PI (phosphatidylinositol), PC (phosphatidylcholine), PS (phosphatidylserine), SM (sphingomyelin), as well as high quantities of LC (lactosylceramide) were detected in the various sample streams irrespective of mechanical action and/or heat treatment of cream prior to processing.
- Significant anti-cancer effects were detected in the various buttermilk fractions produced experimentally.

Opportunity/Benefit:

Follow-on research is necessary to elaborate our scientific understanding of MFGM and document further biological evidence to support health benefit claims but

the expertise developed from this project would be key to such commercially focused research and possible links with industry.

Collaborating Institutions:

Dublin City University

Project Number: 5552

Funding Source: DAFF (05/R&D/TD/370)

Date: March, 2012

Project Dates: Oct 2008 – Mar 2009

How to Proceed:

For further information access the full Technology Update at:
www.teagasc.ie/publications

or contact:

Phil Kelly
Email: phil.kelly@teagasc.ie

Meat Technologies

Teagasc, through its food research centre at Ashtown, supports innovation in the Irish meat industry through the delivery of high quality research and industry development programmes. Areas of expertise include meat quality and safety, process technologies as well as the development of healthier and more functional added value meat products. Facilities include a research abattoir, cooked meats facility, sensory unit and state-of-the-art research laboratories.

Background

Research projects funded especially through DAFF, but also Enterprise Ireland and industry have strengthened the meat research expertise and facilities at Teagasc. State-of-the-art facilities include a pilot scale meat unit incorporating a licensed abattoir, production units for meat processing and packaging under controlled refrigeration systems and a cooked meat facility for curing, smoking and cooking.



Benefits to Industry

Teagasc supports competitiveness and sustainability in the meat sector through excellence in science, technology and management systems. Advice in areas such as packaging/labelling, legislation and food assurance standards, ingredients and equipment sourcing can be provided through consultancy. Various testing services are offered on a fee-paying basis as well as access to training and skills development programmes and facilities.

Areas of Expertise

- Enhancement of meat quality.
- Evaluation of meat quality.
- Development of healthier functional products and value added processed meat products.
- Exploitation of meat by-products and waste streams.

Facilities/Equipment

- Slaughtering/boning.
- Meat processing and cooking.
- Packaging.
- Chilling and freezing.
- Analytical (incl. GC, GC-MS, HPLC, NMR).
- Sensory testing facilities.
- Product development plant/incubation units.

Testing services

- Shelf-life and microbial testing.
- Residue and chemical analysis.
- Compositional and nutritional analysis.
- Consumer and sensory studies.
- Quality testing including flavour, colour and textural analysis.

Range of Solutions

Companies have the opportunity to pay for consultancy services, product development support, access to facilities, training programmes on an individual and confidential basis. Also, routine and speciality meat testing services are available. Collaborations in meat research with academic and industrial partners are also actively undertaken.

Offer may interest

- Meat processors and manufacturers.
- Consumer food manufacturers incorporating meat into their products.
- Research institutes/universities seeking collaborators.

How to Proceed:

For further information contact:

Pat Daly
Tel: +353 (0)1 8059538
Email: pat.daly@teagasc.ie

New Product Development for Food SMEs

Teagasc researchers and technologists have extensive knowledge, expertise and facilities available to support food businesses in new product development at its two food research centres at Ashtown and Moorepark. There is a special focus on supporting new product development (NPD) in SME and start-up food businesses.

Background

Advances in the food sector are accelerating the development of a wide range of new and improved, added-value products and services. The future success of the Irish food industry depends in large on its ability to be at the forefront of this scientific and innovative activity. Teagasc is committed to supporting the food processing sector and provides a range of supports including new product development services.

Benefit to clients

The competitive position of food businesses is very dependent on their capacity to absorb new knowledge and skills and develop innovative products. Teagasc recognises the constant challenge faced by food companies and aims to support and assist them in the new product development process.

Product development supports are backed by the wide-ranging food research programme at Teagasc which has extensive linkages with food research institutes worldwide.

Support and Facilities

- Food development facilities are available at Teagasc Food Research Centres in Ashtown, Dublin and Moorepark, Cork.
- These include pilot and full scale regulatory approved production facilities containing modern equipment for the development of dairy, beverage, meat, bakery and prepared foods.
- Specially designed incubation units are available for sole use by client companies.
- Well-equipped and modern laboratories are available for microbiological, chemical, physical and sensory testing of products.



Of Interest to

Product development support is of interest to food processing businesses, and to suppliers of materials, services and development support to the food processing sector.

Service contracts

Service contracts are agreed with clients and work is carried out on a confidential basis.

A schedule of fees is available on request for the various services provided.

How to Proceed

For further information contact:

Ciarra McDonagh
Email: ciarra.mcdonagh@teagasc.ie
Carol Griffin
Email: carol.griffin@teagasc.ie
Eddie O'Neill
Email: eddie.oneill@teagasc.ie



Dr. Eimear Gallagher

E-mail: eimear.gallagher@teagasc.ie
Phone: +353 (0)1 8059500

Education

National University of Ireland, Cork, and Ashdown Food Research Centre, Teagasc, Ashdown, Dublin 15. Ph.D. in Food Science and Technology. 2001–2005

National University of Ireland, Cork. M.Sc. in Food Science and Technology. 1997–2000

National University of Ireland, Cork. B.Sc. in Food Science and Technology. (2H1). 1993–1997

Career

2000–Present: Senior Research Officer, Teagasc Research Centre, Ashdown, Dublin 15.

1999–2000: Research Scientist, Scientific Support team, Nestlé PTC, York, YO1 1XY, England. (7 month contract).

1997–1997: Research Assistant, Dept. of Food and Nutritional Sciences, National University of Ireland, Cork.

Expertise

Dr. Gallagher's expertise lies predominantly in cereal and bakery research. She has extensive experience in grain milling, empirical dough rheology, confocal and scanning microscopy, digital imaging and sensory analysis. She has developed a particular capability in the gluten-free area, where she has conducted research in product re-engineering, instrumental texture analysis, fundamental rheology and nutritional profiling. As well as conducting publicly funded research, Dr. Gallagher also has a number of confidential, industry-led short-term projects.

Selected Publications

1. Tiwari, U., Cummins, E., Sullivan, P., O'Flaherty, J., Brunton, N., and Gallagher, E. (2011). Probabilistic methodology for assessing the changes in the level and molecular weight of barley beta glucan during bread baking. *Food Chemistry*, 124 (4):1567–1576.
2. Ktenioudaki, A., Butler, F. and Gallagher, E. (2011). Studying the dough characteristics of Irish wheat varieties I. Rheological properties and prediction of baking volume. *LWT – Food Science and Technology*, 44: 594–601.
3. Ktenioudaki, A., Butler, F. and Gallagher, E. (2011). Studying the dough characteristics of Irish wheat varieties II. Aeration profile and baking quality. *LWT – Food Science and Technology*, 44: 602–610.
4. Sullivan, P., O'Flaherty, J., Brunton, N., Arendt, E.K. and Gallagher, E. (2011). The utilisation of barley middlings to add value and health benefits to white breads. *Journal of Food Engineering*, 105: 493–502
5. Alvarez, L.A., Wijngaard, H., Arendt, E.K. and Gallagher, E. (2010). Polyphenol composition and in vitro antioxidant activity of amaranth, quinoa and buckwheat as affected by sprouting and baking. *Food Chemistry*, 119 (2): 770–778.



Dr. Mark Fenelon

Head of Department

E-mail: mark.fenelon@teagasc.ie
Phone: +353 (0)25 42355

Education

Diploma in Process and Chemical Engineering (with Distinction), University College Cork. 2007

Ph.D Food Science and Technology, University College Cork 2000

B.Sc. Dairy and Food Science, University College Cork. 1994

Graduated with a Higher Diploma in Food Science and Technology. 1993

Career

Jun 2010–Present: Head of Food Chemistry & Technology Department, Teagasc Food Research Centre

2004–2010: Principal Research Officer, Teagasc Food Research Centre, Moorepark, Fermoy, Co. Cork

2000–2004: Food Technologist/ Project Manager at Wyeth Nutritionals, Askeaton, Co. Limerick

Expertise

- Current research programme focuses on protein-carbohydrate interactions and their role in improving the functional aspects of re-formulated foods in the nutritional beverage sector.
- Responsible for the recent development and implementation of the new separations / dehydration and ingredients facility located at Teagasc Food Research Centre, Moorepark.
- Experience includes knowledge of project management systems from both an academic and industrial perspective.

Selected Publications

1. McCarthy, N.A., Kelly, A.L., O'Mahony, J.A., Hickey D.K., Chaurin, V. and M. A Fenelon., 2012. Effect of protein content on emulsion stability of a model infant formula. *International Dairy Journal*. In Press
2. Tobin, J.T., S.M. Fitzsimons, A.L. Kelly, and M.A. Fenelon. 2011. The effect of native and modified konjac on the physical attributes of pasteurised and UHT-treated skim milk. *International Dairy Journal*. 2011. 21:790–797
3. Hanley, K.J., Byrne, E.P., Cronin, K., Oliveira, J.C., O'Mahony, J.A. and M.A. Fenelon, 2011. Effect of pneumatic conveying parameters on physical quality characteristics of infant formula. *Journal of Food Engineering* 106: 236–244
4. Tobin, J.T., S.M. Fitzsimons, A.L. Kelly, P.M. Kelly, A.E. Auty and M.A. Fenelon 2010. Micropartitioning of mixtures of whey protein and inulin. *International Journal of Dairy Technology*. 63:32–40
5. Kearney N., Stack H. M., Tobin J. T., Chaurin V., Fenelon M. A., Fitzgerald G. F., R. Ross P., Stanton C. 2011. *Lactobacillus paracasei* NFBC 338 producing recombinant beta-glucan positively influences the functional properties of yoghurt. 21:561–567
6. Abhyankar A. R., Mulvihill D. M., Fenelon M.A. and Auty M.A.E. 2010. Microstructural characterisation of b-lactoglobulin–konjac glucomannan systems: Effect of NaCl concentration and heating conditions. 24:18–26