

Minister Sherlock launches conference

Minister of State Seán Sherlock has launched the Society of Dairy Technology (SDT) Autumn Conference to be hosted by the Southern Ireland Section in Cork in September 2012. The theme of the conference is "The opportunities and challenges of expansion together with the business challenges of meeting diverse nutritional demands and rapidly evolving environmental management targets."



At the launch of the Conference from left to right: Professor Paul Ross, Head of Teagasc Food Research Programme, Professor Gerry Boyle, Teagasc Director, Sean Sherlock, Minister for Research and Innovation, & Pat O'Connell, Chairman, Southern Ireland Section, SDT. Photo: O'Gorman Photography

Solohead Research Farm - Open Day

An open day will be held in Solohead on July 12th focusing on the issues related to farming on wet land, including land drainage, optimum cow type and animal health issues. It will show how artificial drainage can be used to increase the productivity and length of the grazing season on heavy wet soils. Waterlogged soil lowers grass growth. High rainfall on soils with impeded drainage results in surface pugging and poaching damage and structural degradation by grazing livestock, as well as poor machinery trafficability.

Drainage lowers the watertable, which increases load bearing capacity and promotes deeper rooting, thereby improving sward productivity.



safe food foodborne pathogen conference

The annual safe food foodborne pathogen conference, focusing on Campylobacter, Salmonella, Listeria and pathogenic E. coli was held in Belfast in May. There were 120 participants from Ireland, representing industry, research, regulatory authorities and public health.



From left, Lauren McMaster, safe food; Kieran Jordan, Teagasc; Francis Butler, UCD; Geraldine Duffy, Teagasc; Declan Bolton, Teagasc; Mansel Griffiths, Canada.

New Zealand visiting scientist

Nutritionist and Productionist Dr Glenn Judson from New Zealand has taken up a sabbatical position in Moorepark. He works at PGG Wrightson Seeds' Kimihia Research Centre, near Christchurch, and specialises in grazing systems, animal nutrition and forage agronomy. His work in Ireland will focus on animal grazing systems in both the dairy and sheep sectors.

Glenn has considerable experience developing grazing systems that increase on-farm utilisation and productivity of a range of pasture and forage crops, including hybrid brassicas, plantain, red clover, kale and pasture ryegrasses.



Paul Ross appointed to UCC position



Paul Ross, Head of Food Research Programme in Teagasc, has been appointed to the position of Research Professor in UCC, in the Alimentary Pharmabiotic Centre (APC). He will continue in his position as Head of the Food Research programme in Teagasc.

Moorepark Fertility Conference

The Moorepark Fertility Conference and Veterinary Workshop were held in April. Presentations on a broad range of topics were given by international speakers Professor Jock MacMillan (Australia), Dr. Scott McDougall (New Zealand) and Dr. Torstein Steine (Norway) as well as speakers from Teagasc, Animal Health Ireland and some of our leading dairy farmers. The key issues highlighted were genetics, heifer rearing and cow body condition score (BCS).

It is vital that the bulls used to generate replacements will create inherently fertile cows. Management of heifers must focus on achieving target weights from weaning to first breeding, and management of the cow must focus on achieving target BCS during lactation and the dry period. In addition, herd health status and vaccination programme, mineral supplementation and heat detection efficiency were identified as important factors influencing herd fertility.



Speakers at the Conference were, from left, Prof Gerry Boyle, Prof. Torstein Steine, Prof. Jock Macmillan, Dr. Scott McDougall and Dr. Stephen Butler.

Moorepark scientist travels to Australia

Dr. Emer Kennedy is travelling to the Department of Primary Industries (DPI) in Ellinbank, Victoria, Australia, for a 6-month sabbatical. Recently a Memorandum of Understanding was signed between Teagasc and DPI.

While there she will work on two experiments. The first is examining the effect of daily herbage allowance and supplement type on dry matter intake and dairy cow milk production performance. The second will examine lifetime feed conversion efficiency.



'Next Generation Herd' being set up at Moorepark

Moorepark is in the process of establishing a 'Next Generation Herd' of some 100 elite high-EBI dairy females (top 1%), based at the Dairygold Research Farm in Kilworth, adjacent to the Moorepark Research Centre.

We will use this study to enhance the development of EBI for future grass-based systems of milk production.

Analysis of commercial farm data has shown that each €1 increase in herd EBI results in a €2 increase in profit/cow/lactation. The herd will be managed under a controlled systems research study, similar to those studies run at Curtins and previously at Ballydague.

As well as gathering data about routine performance traits such as milk production and composition, somatic cell count and incidence of mastitis, lameness, fertility performance, live weight and body condition score, etc, a set of more detailed measurements not readily evaluated outside the research environment will be considered. These will include differences in fertility

performance, feed intake, intake capacity, production efficiency, energy partitioning, measures pertinent to environmental footprint (enteric methane emissions), lactation physiology, as well as the use of technologies like MIR to exploit variations in the milk mid-infrared spectrum to monitor changes in 'milk quality' over time.

The herd will also provide an opportunity to develop and test new reproductive and genomic technologies (e.g. genotyping of embryos). A likely spin-off from the project is the potential to 'harvest' genetics from what will be a nucleus herd of elite females.

Critical to the supply of young bulls into a breeding programme is protection from infection with IBR; hence, an IBR-negative herd is being targeted. Animals will also be screened for a number of non-regulatory infectious diseases to achieve a herd of the highest health status possible.

Heifers are currently being identified and assembled on an ongoing basis and

infrastructural changes are being made at Kilworth (reseeding, paddock layout, roadways, farm buildings) in preparation for the Next Generation Herd. Moorepark would like to acknowledge the assistance of ICBF and Irish dairy farmers in establishing this herd.



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VIEWPOINT

Teagasc Launch New Technology Transfer Strategy for Irish Food Companies

Research is recognised as the path to innovation and commercialization and Teagasc already engages with over 300 Irish food companies annually, helping them to develop, create value and improve competitiveness. Teagasc invests over €15 million per year in food research to support science based innovation in the food sector. The Teagasc Food Technology and Knowledge Transfer Strategy to support Irish food companies was launched by the Taoiseach Enda Kenny TD in Dublin on the 10th of May. The event, which took place at the Aviva stadium, saw the exhibition of over 40 Teagasc technologies for the food industry. Teagasc's Portfolio of Food Technologies opens five gateways, or opportunities for food companies to utilize and exploit. These include a comprehensive resource of technology offers, updates, services, expertise and scientists, available to food companies to actively engage with.

The five Teagasc Food Technology Gateways are:

Technology Offers: Patent applications have been filed for some technologies and partner companies are being sought for further development and licensing.

Technology Updates: As new technologies are progressed and discovered regular updates will flow out to potential industry partners.

Technology Services: Pilot Plant facilities in Moorepark and Ashtown are available and easily accessible by food companies.

Technology Expertise: Technology services, expertise, facilities, technical training, consultancy and product development services are offered.



Pictured at the Teagasc Food Innovation Gateways event in Dublin recently were Left to right: Professor Gerry Boyle, Teagasc Director, Simon Coveney, TD, Minister for Agriculture, Food and the Marine, Enda Kenny TD, Taoiseach, Dr Noel Cawley, Teagasc Chairman

Technology Profiles: Teagasc scientists work in collaboration with some of the best scientists and researchers from around the world.

The Teagasc Food Technology and Knowledge Transfer Strategy is the start of a continuous process, with live offers, regular updates and follow through for companies who are seeking innovative solutions in the areas of food bioscience, chemistry and technology, industry and development and food safety.

highlights

- ✱ Using Chemistry to measure flavour
- ✱ New Dairy Farm Business Expansion
- ✱ Thermal Analysis of Foods

Mastitis: how much is it costing you?



A tool to measure the financial losses caused by mastitis at farm level has been developed by Teagasc Moorepark in conjunction with Animal Health Ireland, funded by the Research Stimulus Fund of the Department of Agriculture, Food and the Marine.

This tool will motivate farmers to acknowledge the scale of the problem on their farm and implement effective management practices to improve mastitis control. Farmers will use their own data to estimate current costs of mastitis based on the bulk milk somatic cell count (BMSCC) and also set a target BMSCC.

The costs accounted for are milk production losses, treatment, culling and penalties. A cell count reduction of 150,000 cells/ml (from 300,000 to 150,000 cells/ml) on a 300,000 quota would result in an increase in farm profitability of €5,929 per annum at a milk price of 22c/l and €7,436 at a milk price of 35c/l.

The tool is being launched in early July and will be available on the Animal Health Ireland and Teagasc websites.

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Role of new dairy farm businesses in dairy expansion

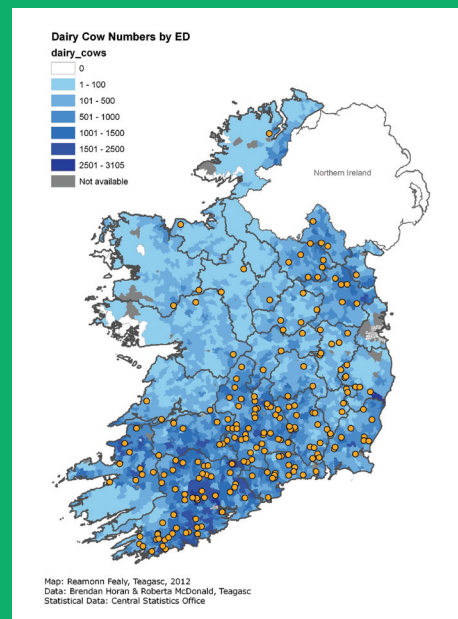
New dairy farm businesses are emerging in response to the abolition of EU milk quotas – and they will change the landscape of the Irish dairy industry.

We have a multi-disciplinary research project at Moorepark studying the characteristics of these new businesses. The purpose of this work is to examine the constraints to new dairy farm development in advance of the quota abolition.

The results of this study indicate that a young and highly-educated group of new farmers are entering the Irish dairy industry, the majority converting from beef farms. The typical new entrant is a 36-year-old male with a minimum of two years of formal 3rd level agricultural education. The vast majority of new entrants to dairying (81%) are located in the south of Ireland, adding further credence to the hypothesis that quota abolition may result in an increased regional polarisation of milk production to the south.

Our census of the new entrants reveals that the most common difficulties experienced by these new businesses include the significant workload burden associated with developing a new dairy enterprise, extremely tight cash flows and the challenges of maintaining good quality grazing pastures to achieve high animal performance.

In many ways, 2010 and 2011 have been excellent years for the emergence of these new dairy farm businesses. Preliminary estimates indicate that they achieved a net profit of 14.3 cent per litre (c/l). Over 350 new entrant dairy farmers expect to set up by 2015 through the New Entrant Scheme.



Regional distribution of new-entrant dairy farms versus the existing dairy cow population density

Our future work in this area will further investigate the barriers to new business development and will provide important information for potential future entrants to the industry.

Roberta McDonald is a UCD PhD student based at the Animal and Grassland Research and Innovation centre at Teagasc Moorepark. Her PhD studies are part-funded by AIB under the Walsh Fellowship Scheme.

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Has white clover a role in intensive grass-based systems?

Intensive dairy farmers have been reluctant to include clover on the grazing platform due to perceived loss of early spring herbage supply and poor persistence in N fertilised swards.

In 2010, we set up a grazed plot experiment to quantify herbage production and clover persistence in frequently-grazed swards at a range of fertiliser application rates (0, 60, 120, 180, 240 kg N/ha).

We now have the results from the first two years of the experiment. These indicate that grass clover swards produced more herbage annually at all N application rates (up to 2t DM/ha) than did grass-only swards. Sward

clover content was lower at the two highest N fertiliser rates, but was retained at a sufficient level to contribute to the sward (average 23% across the year; greatest at over 40% in August).

This experiment will continue for another three years to quantify long-term herbage production and clover persistence.

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Manager of Moorepark Technology Ltd (MTL)

Kieran Downey graduated from UCC with a BSc in Food Science and post graduate qualifications in Project Management. After working in the meat and dairy departments of Dairygold and then the Carbery Group where he was Assistant Production Manager, he joined Moorepark Technology Ltd and subsequently Teagasc as a Food Technologist. In 2011 he was appointed General Manager of Moorepark Technology Ltd (MTL) and now manages the operations of the 3,500 sq m MTL pilot plant and pre-commercial production facility.

MTL provides a range of facilities and services which can be viewed on their new website www.moorepark.ie

MTL is also currently planning the construction of satellite buildings, connected to the pilot plant, to allow an 'on-site' location for customers who plan to use the MTL facilities over the coming 5-10 year period.



If you are interested in any aspect of the MTL pilot plant service, Kieran Downey can be contacted at +353 25 42677 or at kieran.downey@teagasc.ie

New approaches to thermal analysis of foods



With the support of the Teagasc Vision Programme, we have now installed state-of-the-art instrumentation for innovative approaches to thermal analysis of foods at the Teagasc Food Research Centre, Moorepark.

The new Thermal Analysis (TA) equipment strengthens the research and development capabilities of the Irish food industry. It enables us to measure the actual physical properties of food materials and products, and determine their thermal and mechanical histories.

TA will assist in the optimisation of processes used in food manufacture and the stability of foods in various environments. An example of the latter is the influence of proteins on the gelatinisation of starch and its impact on the physicochemical stability and textural properties of products, such as dairy desserts.

Our equipment includes Differential Scanning Calorimetry (DSC) and Dynamic Mechanical

Analyser (DMA). Methodologies have been developed and the instruments are validated for a comprehensive range of thermal analysis applications.

In the food industry, DSC has found applications in analysing protein denaturation, fat crystallization, oil oxidation, starch gelatinisation, and also interactions between food components. DMA is a more useful method to understand the viscoelastic and mechanical properties of food products, such as the softness and shelf life properties of bread, cooking characteristics of pasta, elasticity of gums, etc.

Current studies at Moorepark are focused on characterisation of food ingredients/products to understand the mechanical/thermal properties of foods such as protein bars, infant formula, and dairy ingredients.

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Using chemistry to measure flavour



Gas Chromatography - mass spectrometry

Despite the constant barrage of marketing messages about food, we all still make our purchase decisions on one chief determinant: flavour.

For scientists, flavour is difficult to measure; it comprises ~75% aroma and ~25% taste. In recent years at Moorepark, we have developed a state-of-the-art flavour chemistry facility containing a range of specialized gas chromatography mass spectrometry detection systems to identify volatile aromatic compounds that are uniquely associated with each food or beverage.

As no single technique can isolate all compounds, the facility contains a number of different automated discrimination techniques specifically tailored for the analysis of aromatic compounds, such as solid phase micro extraction (SPME), thermal desorption (TD), intube extraction (ITEX) and purge and trap. Teagasc also has the capability to directly determine some important taste compounds, such as amino acids, sugars and nucleotides. The science behind sensory analysis comprises a set of techniques for the accurate measurement of human responses to foods, as perceived through the senses of sight, smell, touch, taste and hearing. Sensory analysis provides general information about product differences, but cannot provide information as to why products differ. However, when used in combination with flavour chemistry it is possible to specifically identify the flavour compounds responsible.

This information is critical: once individual compounds are identified, their method of formation or source can be elucidated, and any factors which may impact on their formation or concentration can then be controlled to improve quality.

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