

Moorepark News

Research, technology and innovation for the dairy industry

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Viewpoint

A prototype of the Pasture Profit Index will be launched in 2014

Teagasc, in conjunction with the Department of Agriculture, Food and the Marine (DAFM), have developed a profit based index, called the Pasture Profit Index (€/ha), for perennial ryegrass cultivars in Ireland. The purpose of this index is to help grassland farmers identify the best perennial ryegrass cultivar(s) for his/her farm.

The Pasture Profit Index is composed of 6-sub-indices: spring, mid-season and autumn grass DM production, grass quality (April to July, inclusive), 1st and 2nd cut silage DM production and persistency. The economic merit of a cultivar for each trait was calculated by determining the difference between the performance of each cultivar and the base value for that trait. This was then multiplied by the economic value for that trait using the Moorepark Dairy Systems Model. The economic value of an extra kg of grass DM in spring and autumn was higher than mid-season because it supported an extended grazing season. The relative emphasis on each trait was as follows: grass DM yield (49%), grass quality (10%), silage yield (16%) and persistency (25%).

The performance values included in the Pasture Profit Index are based on data collected from the DAFM grass evaluation trials. Varieties are evaluated over a minimum of two separate sowings, with each sowing being harvested for two years after the sowing year. The two harvested years include: (i) a six cut system involving one spring grazing cut, followed by two silage cuts and then three grazing cuts; and (ii) an eight to ten cut system corresponding to normal commercial rotational grazing practice. Pasture Profit Index ranges from €226 to €8/ha per year for the 63 cultivars that had sufficient data available. The sub-indices provide the opportunity to select cultivars for specific purposes. For example, if selecting a cultivar for intensive grazing, the emphasis would be placed on seasonal DM yield and quality with less importance placed on the silage performance. If selecting a cultivar specifically for silage production, then greater emphasis would be placed on the performance of that cultivar within the silage sub-index. A number of successful consultation meetings have taken place with the industry stakeholders, chaired by Dr Brian Wickham. In spring 2014 a prototype of the Pasture Profit Index will be launched with a limited number of cultivars included; it is envisaged that a full list will be released in spring 2015.



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The commercial agenda at Moorepark

Over the past five years there has been an increasing emphasis on development and commercial activity at the Teagasc, Moorepark site. This has resulted in an increasing number of companies establishing a longer term presence at the site, to access facilities. From a company perspective this is an ideal set up, as they can avail of Teagasc research staff experience and knowledge while utilizing the pilot plant; Moorepark Technology Limited. This set up assists companies in fulfilling their ambitious innovation agendas without the need for major investment in R&D infrastructure. The ambitious company innovation agendas are crucial as Ireland enters a period of unprecedented growth and expansion within the Dairy and Meat Sectors.

In 2013 the Teagasc Food Research Programme (at Ashtown and Moorepark) had 246 commercial clients, with an income amounting to €3.5 million. Twenty-four of these clients/companies had contracts in excess of €20,000. Even more impressive is the fact that many of these companies now want a more permanent presence on site. "At present we have 12 companies with staff and research activities at Teagasc Moorepark, and many more wanting to establish similar significant links" according to Prof. Paul Ross, Head of the Teagasc Food Research Programme.

He is of the view that this increase in commercial activity is a fantastic development for the Food Research Programme and ensures that the accumulated pipeline of research, generated across the UCC/Teagasc axis (UCC/Teagasc Alliance) will reach its full commercial potential.

Indeed, plans are currently in progress for a €10 million investment in the pilot plant; Moorepark Technology Limited, with a view to upgrading it to a state of the art, world class R&D facility. It is also a Teagasc ambition to construct a "Food Innovation Hub" at the Moorepark site, to accommodate and nurture the increasing customer base that will undoubtedly benefit from these developments.



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Factors affecting grass quality

Organic Matter Digestibility (OMD) is a common measurement of grass quality. High sward OMD indicates high energy content, and this is a key driver of the nutritional value of grazed grass for dairy cows. The production performance of grass-fed animals is affected by both intake and OMD of the grass.

There are many factors that affect grass digestibility. These include species, cultivar, season and weather conditions. One of the most important factors affecting grass digestibility is the length of the regrowth interval. A long re-growth interval leads to high pre-grazing herbage mass (PGHM) swards, which generally have poorer digestibility than low PGHM swards. Increasing PGHM from 1100 kg DM/ha to 2700 kg DM/ha in the summer caused a reduction in grass OMD and intake. This in turn causes a reduction in milk yield and milk protein concentration.

Experiments are on-going at Teagasc Moorepark to quantify the effects of grass cultivar, PGHM and incorporation of clover into grass swards on OMD at different times of the year.

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Teagasc Milk Qu



The key to continued production of quality milk is to have accurate information, make the right decisions and carry out the recommended actions correctly. That was the clear message from a milk quality conference that took place at the Horse & Jockey Hotel, Co. Tipperary, on Wednesday, 4th December last. The conference was well attended with more than 200 delegates participating.

Four technical sessions took place during the day dealing with issues related to the food industry, bacterial quality of milk, residues in milk and milk somatic cell count. The conference was opened with an overview of the role of the National Dairy Council in relation to milk quality,

presented by National Dairy Council CEO Zoe Kavanagh. Each technical session commenced with an overview paper presented by an expert in the area. Two of those papers had an international perspective. The first was presented by Professor Claus Heggum from the Danish Agriculture and Food Council, Denmark on 'The Moving Window – a New Approach to Food Safety'. The second was presented by Professor Pamela Ruegg from the University of Wisconsin titled 'Understanding and Managing Somatic Cell Counts to Improve Milk Quality'. The remaining papers also gave facts and guidance on the on-farm production of premium quality milk. Finally, a panel discussion focusing on

Next Generation Herd off to a positive start

The Next Generation Herd is an industry good research project that will provide a clear indication of the compatibility of the EBI with future management conditions. Two genetic groups of Holstein-Friesian cows are being evaluated: 1) the top 1% in EBI (ELITE); 2) national average EBI (CONTROL).

Table 1. Overview of cow genetics.

Genotype	EBI	Sub-Indices (€)	
		Milk	Fert
ELITE	244	67	139
CONTROL	121	39	59

In 2013 all cows were in their first lactation. The ELITE heifers had a lower milk volume (-173 kg) but substantially higher milk composition (+0.26 fat % and +0.17 protein %). The net effect was 6 kg greater milk solids yield (fat plus protein) from the Elite heifers. Udder health was



satisfactory. Somatic cell count averaged 130,000 cells/ml during the year. The ELITE heifers were marginally lighter (-6 kg) but with greater body condition score (+0.15). Differences in fertility became apparent from early in the breeding season. Fertility was superior for the ELITE cows; they had greater submission, conception and 6 week in-calf rates compared with the CONTROL cows. The EBI identifies more profitable dairy genetics.

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Quality Conference



Pictured at the Teagasc Moorepark Milk Quality Conference in the Horse & Jockey, Co Tipperary are Steve Sefton, DeLaval, David Gleeson, Teagasc & Michael Keane, Department of Agriculture, Food & the Marine. Photo O'Gorman Photography



Pictured at the Teagasc Moorepark Milk Quality Conference in the Horse & Jockey, Co Tipperary are Pamela Ruegg, Wisconsin, USA, Noel Reilly & Rory Lonergan, Lakeland Dairies, Siobhan Troy, Glanbia & Claus Heggum, Danish Agriculture & Food Council. Photo O'Gorman Photography

issues critical to driving the dairy product industry in Ireland was chaired by Dr. Jack Kennedy of the Irish Farmers Journal.

This milk quality conference was the latest event in a coordinated strategy to improve milk quality on-farm. All of the presentations (alongside other milk quality initiatives) are available for viewing on the Teagasc web page: www.agresearch.teagasc.ie/moorepark/milkquality.

Scientific papers associated with the milk quality conference are published in the most recent edition of the Irish Journal of Agricultural and Food Research (Volume 52: Number 2, 2013).

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SMART FOODS – for improved mental health and cognition

The incidence of depression is increasing substantially worldwide and is predicted to be the second leading cause of disability by 2020 (WHO). Novel strategies, both social and biological, to prevent depression are urgently needed. Recent preclinical and some clinical data suggest that nutrition may reduce depressive symptoms and alleviate cognitive decline, but scientific substantiation of efficacious dietary components is required. Cognitive impairment may be a feature of major depression, which is recognised as a risk factor for age-related dementia.

A new project will investigate the potential of marine-algal-derived omega-3 polyunsaturated fatty acids (PUFA) and marine polyphenols as dietary ingredients with efficacy to enhance mental health and cognition.

This project will involve *in vitro* and *in vivo* preclinical studies to determine the role of omega-3 PUFA and phytochemicals of marine origin in mood regulation. We propose to



use a combination of omega-3 PUFA and sea polyphenols exhibiting antioxidant activity, as a nutritional supplement strategy in an animal model of depression, and should we get positive results, we will unravel the biological mechanisms. The results of this project will lead to functional food ingredients for prevention of depression, and medical foods to increase the potency of conventional antidepressant drugs.

The FIRM-funded project is in collaboration between Teagasc, UCC and NUIG.

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Separations and Dehydration Facility at Teagasc, Moorepark

In response to the expected increase in milk production post 2015, Teagasc has invested in separation & dehydration technologies for the development of new dairy ingredients at the proof of concept pilot plant scale.

The new separations and dehydration facility will build competency in the manufacture of protein based ingredients and nutritional beverages such as infant formula. The facility contains pilot scale membrane separation, chromatography and electro-dialysis, coupled with evaporation and multistage drying equipment.

The combined infrastructure supports the development of new dairy ingredients for applications abroad, providing access to new markets for the Irish Dairy Industry. The facility houses fully replicated manufacturing processes that are currently used in the dairy industry, including a canning operation. The scale of the operation and the parallel analytical capability are ideally suited for development of prototype ingredients and nutritional formulations such as infant formula.

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Tim Guinee



Tim Guinee is a Principal Research Officer in the Dept. of Food Chemistry and Technology at Teagasc Food Research Centre

Moorepark. His research programme focuses on the rheology and functional properties of composite high protein food matrices, and the exploitation of these properties in food manufacture and assembly/formulation, with particular emphasis on gels and cheese-based systems.

He has led a number of large projects funded through FIRM, Enterprise Ireland, and EU Framework programmes. He liaises extensively with the Agri-Food Industry by way of consultancy, commissioned projects, technology transfer, provision of generic/customised training courses/workshops and lectures, and expert reports.

Tim is a graduate of University College Cork where he obtained his PhD in Dairy Chemistry in 1985. He is author/co-author of ca. 84 peer-reviewed scientific papers, 2 patents, 21 book chapters, 3 text books, 2 monographs, and various technical articles. In January 2011, he was appointed Adjunct Professor to the College of Science, Engineering and Food Science, University College.

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Upcoming Events

Open Day at Moorepark Dairygold Research Farm (Kilworth)

Wednesday April 9th 2014

'Up for the challenge - 90% calving in 6 weeks'

See the Next Generation Herd and hear the latest best practice advice:

- Optimum genetics for future pasture-based systems
- Herd reproductive management
- Use of sexed semen
- Heifer management

Science Week

Five second level schools visited Moorepark during Science Week Open Day. The students visited both centres and saw practical demonstration at laboratory, processing and farm level.



Pictured in Moorepark during Science Week are Colaiste An Chraoibhin, Fermoy students Eoin Creagh, Clondulane & Michael Evans, Ballyhooly with Christine Cummins, Teagasc. Photo O'Gorman Photography



The opportunities for a science based career in agriculture and food research were presented to secondary school students in Teagasc Moorepark as part of Teagasc's Science Week activities. Aidan Casey, Teagasc is pictured loading DNA gel with Mitchelstown CBS students Hugh Maloney, Billy Dalton, Conor Casey & Adrian Lamb. Photo O'Gorman Photography.

safefood

At the **safefood** Listeria Knowledge Network Conference organised by Kiersan Jordan, Moorepark were: Eddie O'Neill, Teagasc; Dr. Irene Grant, Queen's University Belfast; Dr. Lisa O'Connor, Food Safety Authority of Ireland; Dr. Kieran Jordan, Teagasc; Bernadette Hickey, Department of Agriculture, Food and Marine; Prof. Martin Wiedman, Cornell University; Prof. Martin Wagner, Veterinary University of Vienna; Dr. Dagmar Schoder, Veterinary University of Vienna; Dr. Avelino Alvarez-Ordóñez, Teagasc; Dr. Panos Skandamis, Agricultural University of Athens.



Irish Laboratory Awards – 2014



Dr. Catherine Dempsey, Judging Coordinator, presenting the award for Food or Agricultural Laboratory of the Year to Paul Cotter, Teagasc, for Teagasc Vision 1 Food Laboratory.

Daniel Cavanagh – 2013 IFSTI medal winner

Daniel won the Institute of Food Science and Technology Ireland (IFSTI) medal for the best food science and technology presentation at the 18th annual Teagasc Walsh Fellowship Seminar 2013.

His presentation was titled 'From fields to fermentationw: characterisation & application of non-dairy cultures in dairy foods.' He is based at the Teagasc Food Research Centre in Moorepark and University College Cork.

Professor Paul Fricke



...from the University of Wisconsin is undertaking a six month sabbatical at Moorepark. Paul is an internationally recognised expert in dairy cattle

reproduction. During his time at Moorepark, he will undertake detailed studies in collaboration with Stephen Butler examining the role of progesterone in lactating dairy cows.

Congratulations to Stephen Moore



...who won the PhD Student Travel Award for best presentation at the annual meeting of the European Association of Animal Production

(EAAP). The award provides funding to attend the American Dairy Science Association (ADSA) annual meeting in July 2014. Stephen's presentation was titled "Physiology of cows with divergent genetic merit for fertility traits during the transition period."

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