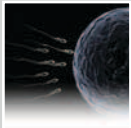


Moorepark News

Issue 34
Winter 2012

Newsletter from the Food Research Programme



Herd Expansion

Rapid expansion facilitated by sexed semen use

PAGE 2



Help the Elderly

Scientific basis for developing foods to promote healthier ageing

PAGE 3



New Analysis

New Moorepark analysis equipment to help food industry

PAGE 3

New facilities will open new market to industry

The Food Harvest 2020 report is predicting substantial growth in milk supplies over the next few years with abolition of quotas and expanding markets abroad. Moreover, growth in the world's population (expected to reach 9 bn by 2050 from its current level of just under 7 bn) will take place almost entirely outside of Europe meaning Ireland as a food producer and exporter will need to ship its perishable food products in dehydrated form to these markets with expanding populations and increasing consumption.

Consequently, ingredient innovation and production has been flagged as being of major importance to the dairy industry as a mechanism for utilisation of the expected expanding milk pool. In response to this, a strategic objective has been adopted by Teagasc to support the development of 'SMART' dairy ingredients in dehydrated form for utilisation of milk. The latter provides opportunities for the Irish Dairy industry and is the basis for the development of a new research facility for separation of dairy ingredients and spray drying.

The facility allows researchers and industry to work at the proof of concept stage of ingredient development while utilising state of the art dairy processing equipment at pilot level. The scope of the facility extends to the highly valuable nutritional beverage (including infant formula), business by providing full replicate processes at a small scale.

Equipment within the facility includes; thermal processing, membrane separation and evaporation / drying facilities, located in separated hygiene zones to support good manufacturing practice. Examples of products which can be processed include Milk and innovative ingredients derived from milk, including whey, lactose, milk hydrolysates, infant formula and nutritional beverages. The selected equipment is intended to bring together a range of complementary unit processes aimed at research and innovation to develop new dairy ingredients, support the nutrition beverage sector and develop highly skilled graduates with skill sets suitable for direct transfer to the Irish Dairy Industry.

Dr. Mark Fenelon
Tel: 025 42555
Email: mark.fenelon@teagasc.ie

Is dairy farming for me?

Viewpoint

In response to recommendations in the Food Harvest 2020 report, Teagasc in association with University College Dublin has developed a new Professional Diploma (Level 7) in Dairy Farm Management.

It will incorporate two years' Professional Work Experience with a minimum entry requirement of a Level 6 Advanced Certificate in Agriculture or equivalent award. The first year will be based on progressive Irish dairy farms with an option to travel overseas during the second year.

The programme will be based on four modules: Dairy Production Technology, Dairy Farm Management, Growing Your Dairy Business and Dairy Professional Work Experience. It will incorporate 6 weeks of contact modules delivered by a team of highly experienced Teagasc education, research and specialist staff, and will also include guest speakers. The modules will be delivered at both Teagasc Kildalton and Teagasc Moorepark. Additionally trainee dairy farm managers will be required to participate in monthly discussion group meetings.

In an Irish context, there is an urgent requirement to provide opportunities for well-trained young farmers to grow and develop their farming business. At the same time, it is necessary to provide opportunities for



older farmers to exit active farming in a progressive manner while retaining a positive role as long as they are capable and interested in doing so. New career pathways will bring Ireland in line with other dairy industries that have developed career structures to enable committed energetic people from both farm and non-farm backgrounds to develop successful careers within dairying. Successful graduates will have diverse career pathways as farm owners, professional farm managers, sharemilking and equity partnerships.

An industry steering group under the chairmanship of Jim Treacy will provide direction and guidance to Teagasc/UCD in running the programme. It includes representatives from the Irish Farm Managers Association, Master Farmers Association and Farm Apprenticeship Board. James Ryan, Teagasc Kildalton, and Dr Karina Pierce, UCD, are programme co-ordinators with the assistance of George Ramsbottom, Teagasc Oak Park, and Dr Frank Buckley, Teagasc Moorepark.

In 2012, 19 graduates have commenced the first year of this course and it is hoped that numbers will increase in future years.

Pat Dillon
Tel: 025-42250
Email: pat.dillon@teagasc.ie

New swards study for Clonakilty Agricultural College



A new experiment investigating the effect of tetraploid and diploid swards, with and without clover inclusion, on the productivity of spring milk production systems is being set up in Clonakilty Agricultural College and will commence in 2013.

Recent research indicates that grass cultivars have an effect on milk production. Animals that grazed tetraploid monocultures produced more milk than animals that grazed diploid monocultures. Research also shows that the inclusion of clover in the sward may have beneficial effects on herbage and milk production.

A four farmlet system experiment using four groups of 30 cows will commence

in the college in January 2013. Three distinct genotypes (Holstein-Friesian, Holstein-Friesian x Jersey and Holstein-Friesian x Jersey x Norwegian Red) will be evaluated in this study, with equal numbers of each genotype in each treatment.

The objective of this study is to evaluate the effect of tetraploid and diploid cultivars with and without clover inclusion and cow genotype on the productivity of spring-calving milk production systems over a number of grazing seasons.

Brian McCarthy
Tel: 025-42686
Email: brian.mccarthy@teagasc.ie

Improving colostrum quality

High rates of illness and death in young calves can be stressful for farmers and can result in high costs being incurred on farms. Feeding a sufficient volume (3 litres) of high quality colostrum within 2 hours of birth is critically important for the health and future productivity of the newborn calf. The quality of colostrum fed is defined by the concentration of antibodies or IgG (immunoglobulins). Good quality colostrum has an IgG concentration above 50g/L.

A study at Moorepark Research Farm in 2011 established that the colostrum quality from dairy cows in well-managed herds is high (average 112g/L IgG). Ninety-six per cent of cows in this study produced colostrum with an IgG concentration above the threshold of 50g/L IgG.

The study found the following factors affected colostrum quality:

Milking cows as soon as possible after calving increased quality

Cows in later lactations had higher quality colostrum than heifers; however, 90% of heifers produced colostrum with >50g/L IgG.



Lower-yielding cows produce higher quality colostrum

Cows that calve in early spring (Jan to Mar) or autumn produce high quality colostrum

Reducing the time interval between calving and collection of colostrum is the most immediate and practical means by which farmers can maximise colostrum IgG concentration.

Muireann Conneely, Emer Kennedy
Tel: 025-42379
Email: muireann.conneely@teagasc.ie

Can sexed semen accelerate expansion in Irish dairy herds?

The ability to increase the number of heifer calves born by selecting the sex of offspring at conception is of great benefit to dairy industries around the world.

The technology for sorting semen is capable of delivering a 90% bias in resulting offspring, although the fertility of the sexed semen product is reduced compared with conventional semen. Much of the deterioration in fertility can be avoided if the sexed semen is used fresh rather than frozen-thawed.

A bio-economic model has been developed to determine the effects of using sexed semen (on maiden heifers only) on replacement heifer numbers, rate of herd expansion, and overall farm profitability. Figure 1 illustrates the greater numbers of replacement heifer calves and faster rates of herd expansion (from 100 up to a maximum of 150 cows) facilitated by the use of either fresh or frozen-thawed sexed semen compared with conventional frozen-thawed semen.

The use of sexed semen increased overall farm profitability. The rapid expansion facilitated by sexed semen use, however, increased financial pressure on the farm business, with negative cash flows in years of greatest expansion.

Ian Hutchinson, Laurence Shalloo, Stephen Butler
Tel: 025-42633
Email: ian.hutchinson@teagasc.ie

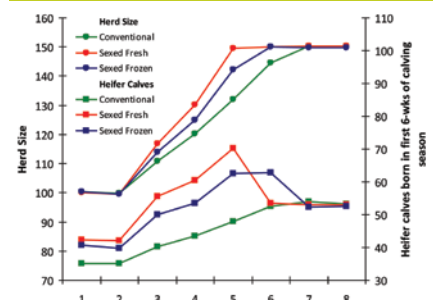


Figure 1: Herd size and number of heifer calves born in the first 6 weeks of the calving season using fresh sexed, frozen-thawed sexed or frozen-thawed conventional semen on maiden heifers.

Moorepark involved in research to help elderly



Joint Moorepark and UCC findings relating to diet and the elderly provide exciting new opportunities for the food industry. It means there is now a scientific basis for developing foods to promote healthier ageing.

The ELDERMET project of University College Cork and Teagasc Moorepark aims to understand the link between diet, health and lifestyle of older Irish people (>65 yr) and the composition of the bacteria in their gut. The study involved 178 people (average age: 78) who were either community-based, out-patients in day hospitals, in rehabilitation facilities or in long-term residential care.

Information on diet, cognitive function, immune function and physical activity was compiled, and DNA sequencing technology used to determine the composition and function of the gut microbiota of these volunteers. Older people living in the community were found to have better indicators of health, a more varied diet and a gut microbiota distinct from older people living in long-

term residential care. Overall, a healthy diverse diet was seen to promote a more diverse gut microbiota, and the loss of this diversity correlated with increased frailty and accelerated ageing.

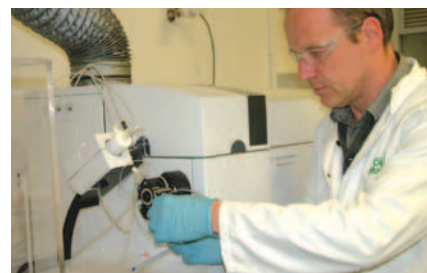
Even though other factors influence our health as we age, our diet shapes the make-up of our gut bacteria, which in turn affects our health. The inclusion of foods or food ingredients in the diet which encourage the growth of certain gut bacteria would be useful for maintaining health and slowing the ageing process in the elderly. The research has been published in the international journal *Nature*.

The ELDERMET project is funded by the Department of Agriculture, Food and the Marine and the Health Research Board.

Prof. Paul Ross (Teagasc),
Tel: 025 42229,
Email: paul.ross@teagasc.ie or

Dr. Paul O'Toole (UCC),
Tel: 021 490 3000,
Email: pwotoole@ucc.ie

New Moorepark analysis equipment to help food industry



Bernard placing samples in the ICP-MS

The world of mineral analysis is undergoing significant change with the advent of ICP-MS (Inductively Coupled Plasma Mass Spectrometry). This new equipment makes it possible to do simultaneous multi-elemental analyses on samples for all of the major elements as well as the extremely sensitive analysis on trace elements to parts per billion.

With all this in mind it was decided to invest in a new ICP-MS to aid the research work being undertaken both in the Moorepark Food Research Centre and the Moorepark Dairy Production Centre.



A key part of this work will involve its use in aiding the development of new infant formulas as well as novel food ingredients in the MFRC by the research teams under the watch of Instrument Technologist Bernard Corrigan. Norann Galvin, the technologist of the dairy production laboratory, is also being trained on the ICP-MS to aid in its use for dairy production research.

Bernard Corrigan
Tel: 025 42427
Email: Bernard.corrigan@teagasc.ie



Milk and probiotics a huge success at ESOF

The Teagasc Food Programme featured strongly in the EuroScience Open Forum (ESOF) held this summer in Dublin, the European City of Science 2012. Prof. Paul Ross hosted a session entitled 'Milk: Nature's Perfect Food?' to a packed audience, including international food scientists, dairy industry representatives and journalists.

The session opened with Prof. Bruce German of the University of Davis, California, dispelling the myth surrounding the association of dairy

consumption with human ill health such as cardiac disease. He showed compelling epidemiological evidence to the contrary.

Teagasc's Dr Catherine Stanton followed with 'Milk Intelligence', a presentation chartering the array of health-promoting substances in milk, including conjugated linoleic acid, a milk component abundant in pasture-fed animals which has a range of health properties.

The session closed with an enthusiastic account from Dr Mark

Fenelon, Teagasc, on the potential to develop new value-added dried ingredients from milk with added "smart" properties.

Prof. Ross also participated in 'Probiotics: alternative medicine or evidence-based alternative' with APC colleagues on July 13th. This session gave a very upbeat account of the latest scientific evidence to support the health-promoting properties of probiotics and gut microbiota in general.

Solohead Open Day, July 2012



A section of the 1,500 people who attended the Teagasc Open day at the Solohead Research Farm on Thursday, July 12th. With the very high rainfall and very wet ground conditions experienced throughout many parts of the country this year, there was a lot of interest in the drainage systems and management practices on display.

Chinese Delegation



Chinese delegation visiting Moorepark

A Chinese Delegation from the Hokkaido University Research and Business Park (HU R&BP) visited Moorepark. They had an opportunity to meet researchers and see the facilities and expertise available at the centre. They are interested in exploring opportunities for mutual exchanges and research collaborations with both Irish Universities and Research Centres.

THE HU R&BP plan to establish a world-leading "Health Science/Medical Services Hub" using support programmes provided by the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

Contact Us

If you have any comments or suggestions, please contact

Niamh O'Brien

Tel: 025 42313

Email: niamh.obrien@teagasc.ie

Teagasc,
Moorepark,
Fermoy, Co.Cork

www.teagasc.ie

Teagasc National Dairy Conferences 2012



Stan McCarthy, Managing Director of the Kerry Group, will be the keynote speaker at the National Dairy Conference in Tralee this year

The 2012 Teagasc National Dairy Conferences will take place on Tuesday 20th November in Tralee and Wednesday 21st November in Mullingar. Both conferences will feature Teagasc and invited speakers delivering papers on topics around the theme of 'Is Ireland ready for more milk?'

Farmhouse Cheese Course



Eddie O'Neill and Kieran Kilcawley getting course participants to taste different cheeses during the sensory evaluation session.

A very successful Farmhouse Cheese Course was held in Moorepark during September. People from the industry as well as people interested in setting up their own cheese business attended. The course provided both theory and hands-on experience in producing different cheeses.

Quality Workshops

Teagasc will be holding The Moorepark Quality Workshops in December 2012.

The dates and venues are:

04/12 Moorepark December 4th

06/12 Slieve Russell December 6th

Some of the topics to be included are: TCM, Detergents and PCS numbers (with detergents), SCC-AHI/Teagasc programme, Bacillus cereus/on-farm study, MRLs and flukicides.

Further information: Niamh O'Brien

International journal Nature publishes our research



Minister for Agriculture, Food and the Marine, Simon Coveney at UCC with members of the ELDERMET team: Prof. Ger Fitzgerald, Prof. Fergus Shanahan and Prof. Colin Hill (all UCC), Minister Coveney, Prof. Paul Ross (Teagasc), Dr. Siobhan Cusack and Dr. Paul O'Toole (both UCC).

Results from the ELDERMET project were published in Nature, the prestigious international journal. The ELDERMET group is based at UCC Cork and Teagasc Moorepark. The research aims to understand the link between diet, health and lifestyle of older Irish people. See the ELDERMET article on page 3 for details of the research.

Greenfield Open Day, Kilkenny



An Open Day took place on the Greenfield dairy farm in Kilkenny on Thursday, June 21st. Now in its third year of milk production, some clear messages are emerging and these were communicated to dairy farmers at the open day. The financial performance of the farm was presented, including profit after repaying loans, cost of producing milk, and farm development costs.

Visiting Scientist



Professor Derrick Rousseau from Ryerson University Canada, was a visiting scientist to Moorepark in July and August. He worked with a number of the researchers in Moorepark, in particular, André Brodtkorb and Mark Auty, using advanced microscopy techniques to study solid lipid nano-particles for food applications.