



TEAGASC RESEARCH IMPACT HIGHLIGHTS IN 2014

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FOREWORD



Dr Frank O'Mara
Director of Research

This publication outlines highlights from the impacts achieved in 2014 from research conducted in Teagasc. It follows from a similar publication last year. Our strategy is to conduct excellent research that provides a solid basis for achieving science-based impact. The examples shown here, of actual impact at industry level, demonstrate that this strategy works. Having an impact is critically important to Teagasc, and highlighting the impact we have is necessary to demonstrate, to the taxpayer and stakeholders who fund our research, that it is a good investment. These are just examples and are not an exhaustive account of the impact of Teagasc, which is achieved by the combination of our research, advisory and education activities. We strive to ensure our research will have impact, so it is pleasing to have such a set of significant impacts to highlight again for 2014. I would like to acknowledge the huge contribution of Teagasc specialists and advisors, both in terms of direct input into some of the research underpinning these impacts and in transferring this knowledge to farmers and food companies to allow the impact to be achieved. I would also like to acknowledge the many collaborators we have in universities, institutes of technology and other external bodies, as well as the farming community and agri-food companies, which were involved in many of the research projects leading to these impacts, and were instrumental in the successful

achievement reported. We greatly value those contributions that are highlighted in the individual reports. Excellent science requires excellent scientists. We need to be able to attract, develop and retain top scientists if we are to continue to deliver impacts like those highlighted in this publication. Teagasc is fortunate to have an outstanding core of scientists, supported by top-class technical, farm and administration staff. This needs to be maintained into the future. The talent of our Walsh Fellows (MSc and PhD) and post-doctoral scientists bodes well for the future, but these experts must view research as an attractive career if we are to continue to support the agri-food industry with new scientific knowledge as good as, and better than, our competitors. Research requires investment, and Teagasc is fortunate that it has been successful in recent years in supplementing its grant-in-aid with funding from other sources to allow more research to be carried out. The Department of Agriculture, Food and the Marine is the major funder of Teagasc research through provision of grant-in-aid and through its competitive funding programmes, FIRM, the Research Stimulus Fund, and CoFoRD. Other funding comes from EU research and innovation programmes, Science Foundation Ireland, Enterprise Ireland, the Environmental Protection Agency, farmers and agri-food companies. This funding is gratefully acknowledged.

Irish Soil Information System

Dr Rachel Creamer, Reamonn Fealy and Dr Rogier Schulte



OTHER CONTRIBUTORS AND COLLABORATORS

University College Dublin and Cranfield University (UK).

FUNDING

Environmental Protection Agency (STRIVE)
and Teagasc grant-in-aid.

The completion of the 3rd edition of the soils map of Ireland provides a major resource for Irish agriculture. The new map now provides soil information at a 1:250,000 scale providing information on soil series, mapped as associations. In addition to the soils map, this project provides a database of soil profile information relating to both the original 450 soil series recorded by An Foras Talúntais, as well as an additional 240 soil series recorded in the Irish Soil Information System (SIS) project. The soils map of Ireland will be used by a large range of stakeholders, including researchers, agricultural advisors, farmers, teachers, policy makers and the European Commission. Since its launch in September 2014, the SIS website has been visited by 4,200 users and has had more than 31,000 individual page views. This project was completed with the support of thousands of farmers, Teagasc advisors and the Department of Agriculture.

Development of a continental cheese

Dr Diarmuid Sheehan

In June 2014, Kildery cheese was launched to market in Germany under the Kerrygold brand. It is the first commercial output of the Dairy Innovation Centre which is a Teagasc-Irish Dairy Board public private partnership and was developed in conjunction with Tipperary Co-op. Kildery is a Maasdammer-style eye-type cheese, but differentiated by its intense and mature flavour. Maasdam is the largest branded cheese category in Germany and Kildery will move Kerrygold from being a specialty cheese player to a mainstream cheese brand in the German market. It has already won three international cheese awards. Development and commercialisation of Kildery was achieved through the application of scientific and technological advances and expertise developed through: the Teagasc cheese diversification programme; the capacity of the Irish Dairy Board to identify market opportunities and to utilise its market distribution infrastructure; and the production expertise and technical capabilities of Tipperary Co-op.



OTHER CONTRIBUTORS AND COLLABORATORS

Irish Dairy Board and Tipperary Co-op.

FUNDING

Teagasc grant-in-aid, Irish Dairy Board and Tipperary Co-op.

The economic impact of formal agricultural education

Dr Kevin Heanue and Professor Cathal O'Donoghue



In recent years, the demand for formal agricultural education has risen significantly while the capability of organisations, like Teagasc, to meet that demand has been resource constrained. In 2014, Teagasc conducted an economic analysis of the impact of agricultural education. Using conservative estimates, this analysis for the period 2000 to 2011 showed that there is a significant private and social return to investment by individual farmers in formal agricultural education. The analysis supported Teagasc requests for increased public resources to meet the growing demand for formal agricultural education. Among the benefits are the continued training of farmers and it will also facilitate access to DAFM-led schemes – such the National Reserve and Young Farmers Scheme.

OTHER CONTRIBUTORS AND COLLABORATORS

Teagasc cross-directorate Economics of Agricultural Education project team and Teagasc National Farm Survey.

FUNDING

Teagasc grant-in-aid.

COW index

Margaret Kelleher, Professor Donagh Berry,
Dr Laurence Shalloo and Dr Frank Buckley

A novel index, COW, was developed to rank females on expected future lifetime profitability. It takes cognisance of directly transmissible genetic effects (i.e., the economic breeding index [EBI]) and heterosis, as well as prevailing cow-level factors such as parity, udder health, and both calving date and expected calving date in the subsequent lactation. This COW index will be complementary to the EBI. The EBI will be used to identify genetically elite animals as candidate parents of the next generation; while the new COW index will be used to identify less-profitable females for culling.



OTHER CONTRIBUTORS AND COLLABORATORS

ICBF and Abacus Bio Ltd, New Zealand.

FUNDING

Teagasc grant-in-aid.

Greenhouse gas working group

Dr Rogier Schulte, Trevor Donnellan and Dr Gary Lanigan



Image courtesy of Bord Bia

FUNDING

Teagasc grant-in-aid.

In 2014, the European Council took a major decision on the Climate and Energy Framework for 2030, and adopted the amendment, proposed by Ireland, that recognises that agricultural emissions should not be reduced at the expense of food security. Working with the Agricultural Climate Group chaired by the Department of Agriculture, Food and the Marine, Teagasc provided the science base for the amendment. Teagasc, together with other State actors, has proposed 'Integrated Land Management' as a pathway to growing the output of low-carbon food and as an alternative to blunt reduction targets for agricultural emissions that could only be achieved through reductions in food output. Heretofore this approach could not be accounted for within the European policy framework. This changed with the recent European Council decision that explicitly opens the door to Integrated Land Management, in which agricultural emissions may be partially offset by sequestration through e.g. afforestation. This was a joint effort by the Agricultural Climate Group, consisting of the DAFM; Teagasc; the Environmental Protection Agency and Bord Bia.

Identifying the cause of the cheese pinking phenomenon

Dr Lisa Quigley, Daniel O'Sullivan, Dr David Daly,
Dr Orla O'Sullivan, Dr Tom Beresford, Dr Linda Giblin,
Dr Diarmuid Sheehan, Dr Paul Cotter

DNA sequencing has revolutionised our understanding of microbial populations in complex systems, including foods. Teagasc has applied sequencing to study the microbiology of cheese with a pink discolouration spoilage defect, a phenomenon that has been responsible for economic losses within the global cheese industry for decades. Through this approach, a microorganism, which was overlooked when traditional microbiology techniques were employed, was revealed as the source of this problem. This information will now be used to control the pink discolouration phenomenon and similar strategies will be employed to investigate the involvement of microorganisms in other food defects of unknown origin.



Image courtesy of Bord Bia

OTHER CONTRIBUTORS AND COLLABORATORS

University College Cork.

FUNDING

Teagasc grant-in-aid and the Department of Agriculture, Fisheries and Food (Food Institutional Research Measure).

Monitoring fungicide resistance in cereal pathogens

Dr Steven Kildea, Tim O'Donovan, John Spink



OTHER CONTRIBUTORS AND COLLABORATORS

Teagasc researchers, advisors and specialists (disease monitoring and research dissemination); Agri-Food and Bio Sciences Institute, Northern Ireland; University College Dublin; Reading University, Scottish Rural College (SRUC).

FUNDING

Teagasc grant-in-aid; Department of Agriculture, Food and the Marine.

Teagasc research has determined that since 2008, the sensitivity of Irish *Zymoseptoria tritici* to the main azole fungicides (epoxiconazole and prothioconazole) has been declining. This group of fungicides is essential to maintaining yields in our cereal crops because our climate leads to very high disease pressure. Therefore, it is essential to ensure anti-resistance strategies are implemented. Our research has developed strategies that ensure effective disease control and minimise resistance development: the most effective chemistries should only be used when required and, when applied, an additional effective mode of action is included. Increased awareness among agronomists and growers has resulted in changes in practice, most notably the reduction in usage of azole fungicides at the T0 timing on winter wheat. This will help to preserve the effectiveness of this group of fungicides as control agents in our cereal crops.

Teagasc joint industry dairy development

Richard O'Brien and George Ramsbottom

Teagasc engages with a number of Irish milk processors to promote profitable grass-based milk production. A review of the 2010-2014 programme with Glanbia Ingredients Ireland (GII) has just been completed. It prepared suppliers for quota abolition through promoting key technologies relating to grassland, breeding and cost control developed through a number of research projects undertaken at Teagasc Moorepark. On average 1,500 suppliers attended events on the programme's 11 Monitor Farms in each of three years; 1,700 suppliers participated in discussion groups and over 2,000 suppliers attended Expansion Workshops. Performance on the Monitor Farms improved with grass grown increasing by over 2.0t/ha DM; six-week calving rate increasing by 18 percentage points to 77%; and efficiency gains achieved worth over €500/ha. Performance for a matched sample of 300 discussion-group members also improved with grass grown increasing by an estimated 1.75t/ha DM; six-week calving rate increasing by four percentage points to 66%; and efficiency gains achieved worth over €450/ha.



OTHER CONTRIBUTORS AND COLLABORATORS

Teagasc Dairy Knowledge Transfer Department and Teagasc B&T advisors; and Glanbia Ingredients Ireland.

FUNDING

Joint Industry Programmes are funded by milk processors; this programme reported was funded by Glanbia Ingredients Ireland.

Teagasc heavy soils programme

Pat Tuohy, James O' Loughlin, Dr Owen Fenton, Dr David Wall,
Dr Pat Dillon, Ger Courtney and John Maher



The heavy soils programme aims to demonstrate methods to improve grassland productivity and utilisation, decrease volatility in these parameters and sustain viable farm enterprises on poorly-drained soils. Land drainage is a major focus. Ideally, land-drainage design involves analysis of soil's physical properties coupled with standard design formulae to prescribe drain spacing and depth. In reality, this method is not practical and not in common use. There is reliance, therefore, on haphazard and ineffective designs. In the Teagasc Heavy Soils Programme, a new design methodology has been developed that overcomes these shortcomings by instigating site-specific drainage systems. This provides the industry with a standardised method of approaching land drainage design in the field that has been shown to be highly effective in prescribing effective land-drainage systems on the eight farms in the study. In 2014, four highly successful on-farm open days showcasing this methodology attracted over 1,200 visitors, including farmers and drainage contractors.

OTHER CONTRIBUTORS AND COLLABORATORS

Participating farmers in the Teagasc Heavy Soils Programme and their Teagasc advisors; University College Dublin.

FUNDING

Kerry Group, Dairygold Co-op, Tipperary Co-op, Teagasc grant-in-aid.

Starter cultures development

Dr Olivia McAuliffe, Dr Mary Rea and Dr Kieran Kilcawley

Fermented dairy products are one of the key drivers of exports by the dairy industry. The starter cultures used for production of these products are of great industrial significance, but the drive for new products to meet consumer demands can push the boundaries of microbial performance, requiring the constant development of new starter cultures with novel properties. Teagasc has developed valuable capabilities in starter selection and improvement by employing state-of-the-art advances in high-throughput genomic technologies, resulting in a more 'knowledge-based' approach to the selection and generation of desirable cultures. By combining the knowledge gained from genomic studies with classical strain improvement methods, food-grade cultures with enhanced properties including phage resistance, biopreservation and flavour enhancement have been developed; while novel, wild-type strains were screened for traits that may confer that unique product attribute. Working with the main commercial culture suppliers and a number of high-profile national and international dairy companies, some of whom are on-site working directly with Teagasc researchers, Teagasc successfully transferred a number of superior starters to the industry in 2014, thus supporting competitiveness and innovation in the fermented dairy sector.



OTHER CONTRIBUTORS AND COLLABORATORS

Commercial culture suppliers, commercial dairy companies, University College Cork.

FUNDING

Private industry, Teagasc grant-in-aid, Irish Dairy Levy Research Trust

Energy and capital-efficient dairying

Dr John Upton, Dr James Humphreys and Dr Laurence Shalloo



OTHER CONTRIBUTORS AND COLLABORATORS

Teagasc advisors and Knowledge Transfer staff (farm selection and research dissemination); Wageningen University and Cork Institute of Technology.

FUNDING

Teagasc grant-in-aid.

This participatory research project carried out on 22 commercial dairy farms investigated the energy consumption trends and energy costs associated with producing milk in Ireland. Results indicated that pre-cooling milk with well-water can reduce on-farm electricity consumption by 28%, increase overall 10-year profitability by 0.8% (€3,960) and reduce annual CO₂ emissions by 4.8 tonnes on a farm with 200 cows. In general, farm profitability was maximised through investment in a direct expansion milk cooling system with pre-cooling of milk with well-water prior to entry to the milk tank, heating water with an electrical water heating system and using standard vacuum pump control on the milking system. These equipment configurations have been adopted by many of the farms in the project and are now the default choice for the majority of Irish dairy farmers.

Measuring farm-level sustainability

Dr Thia Hennessy, Dr Cathal Buckley, Dr Emma Dillon, Trevor Donnellan, Dr Kevin Hanrahan, Brian Moran and Mary Ryan

As the concept of sustainability is one of the foremost issues in global agriculture and food marketing at present, there is a need for credible and soundly-based evidence of the sustainability of Irish agriculture. To this end, a set of nationally representative farm-level sustainability indicators across four dimensions (economic, environmental, social and innovation) have been developed for Ireland using the Teagasc National Farm Survey. The farm-level indicators also include a nationally-representative, life-cycle assessment measure of Irish milk production. The calculation of these metrics and the capacity to measure progress or regress with respect to sustainability objectives on an annual basis helps inform policy design and supports agricultural advisory and education by allowing for the assessment of the sustainability status of Irish agriculture. Teagasc is currently involved in an EU funded project, led by the LEI at Wageningen University exploring the capacity of other Member States to undertake similar initiatives.



OTHER CONTRIBUTORS AND COLLABORATORS

Irish Cattle Breeding Federation.

FUNDING

Teagasc grant-in-aid.

Review of agri-taxation

Kevin Connolly, Fintan Phelan, Dr Kevin Hanrahan,
Professor Cathal O'Donoghue and Brian Moran



OTHER CONTRIBUTORS AND COLLABORATORS

Mary Nyhan from Nyhan Tax Advisers.

FUNDING

Teagasc grant-in-aid.

The Department of Agriculture, Food and the Marine along with the Department of Finance engaged in a review of agri-taxation in 2014. The objective of the agri-taxation review was to: evaluate existing reliefs; to propose new measures to promote the mobility of land and the intergenerational transfer of farms; and better align taxation policy with Government policy towards the agri-food sector (e.g., Food Harvest 2020). Economic research conducted by Teagasc on the age structure, capital structure and viability of farms was used to provide a context for the need to address land mobility and intergenerational transfer. Teagasc expert farm financial advice was instrumental in assisting in the evaluation of the benefits of existing and proposed new measures, especially around issues such as the long-term leasing of land, alternative farming models and farm restructuring. The agri-taxation review led to the establishment of a number of new tax incentives in Budget 2015 that are likely to benefit a large number of farmers and improve the overall structure and productivity of the farm sector in the future.

The Pasture Profit Index

Dr Michael O'Donovan, Dr Nóirín McHugh and Dr Laurence Shalloo

The Pasture Profit Index is a tool to evaluate the overall merit of a grass variety from the point of view of its impact on profitability. The weightings in the index are 46% on dry matter (DM) production (seasonal and silage yields), 20% on grass quality and 34% on sward persistency. The index was launched in 2014 and will be fully rolled out to the grassland industry in 2015. The work programme of the index was initiated by changing the Department of Agriculture, Food and the Marine grass evaluation protocol in 2010 from a conservation-based protocol to a more grazing-based protocol. Grass digestibility is now measured more frequently within the new protocol to better reflect a grazing scenario, which reflects what happens at farm level. This new tool allows farmers make better decisions about varietal selection when reseeded. A new industry stakeholder group has been established to guide this work and help in dissemination.



OTHER CONTRIBUTORS AND COLLABORATORS

Department of Agriculture, Food and the Marine; the grass seed industry and Agri-Food and Biosciences Institute, Northern Ireland.

FUNDING

Department of Agriculture, Food and the Marine Research Stimulus Fund, Teagasc grant-in-aid and the Dairy Levy Research Fund.

Specialist residue testing

Dr Martin Danaher, Dr Mary Moloney, Sarah Tuck,
Martin McCormack, Paddy Byrne.



Pyrethroid and pyrethrin pesticides represent some of the most important pesticides that are used in animal production and crop protection. In this work, a new test based on liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS) was developed to detect these pesticides in animal fat (of avian, bovine, cervine, equine, ovine and porcine species) and honey. This is advantageous in terms of range of analytes, sensitivity, accuracy and precision. The method was comprehensively validated and is accredited to ISO17025 standard. It is currently being applied to monitor the safety of Irish food, to support the National Residue Control plan, and to satisfy the exacting specifications of international clients.

OTHER CONTRIBUTORS AND COLLABORATORS

Department of Agriculture, Food and the Marine and
Cork Institute of Technology.

FUNDING

Teagasc grant-in-aid.

Forestry in Ireland – modelling its economics

Mary Ryan, Dr Vincent Upton, Dr Peter Howley, Dr James Breen,
Anne Kinsella, Professor Cathal O'Donoghue

An analysis of the economics of the farm afforestation decision was undertaken by Teagasc which contributed to the development of the government's 2014-2020 Afforestation Programme. The economics of the farm afforestation decision were examined by building a forest bio-economic model to integrate direct costs, opportunity costs, forest subsidies and market returns into the decision-making framework. This shows that the Net Present Value (NPV) of changing from an agricultural enterprise to selected forestry options offers a positive NPV for the majority of cattle and sheep farmers. Further research using Teagasc National Farm Survey (NFS) data showed that the larger a farm and the older the farmer, the more likely it is that the farmer has planted part of their land. This research gives policy makers a better insight into the farm characteristics of those farmers likely to afforest land.



OTHER CONTRIBUTORS AND COLLABORATORS

Teagasc Forestry Development Department, University College Dublin.

FUNDING

Council for Forest Research and Development (COFORD).

Detection of anthelmintic resistance on two Irish beef research farms

Dr James O'Shaughnessy, Dr Paul Crosson,
Dr John Mee and Dr Bernadette Earley



OTHER CONTRIBUTORS AND COLLABORATORS

University College Dublin and Department of Agriculture, Food and the Marine, Regional Veterinary Laboratory, Sligo.

FUNDING

Teagasc grant-in-aid.

The efficacy of anthelmintics currently available in Ireland was examined using a faecal egg count (FEC) reduction test in dairy calves. In study A, treatment resulted in mean FEC reductions of 49%, 99% and 100% for ivermectin, fenbendazole and levamisole-treated groups, respectively. In study B, treatment resulted in a mean FEC reduction of 37% for ivermectin-treated calves. The presence of *Cooperia* in post-treatment cultures on day 14 in ivermectin-treated calves in both studies indicates resistance of this genus. Both levamisole and fenbendazole demonstrated high efficacy in treating gastro intestinal nematode challenge. This study is the first report of anthelmintic resistance in cattle in Ireland and is a very important finding in relation to control of these major parasites in our cattle herd.

The control of *Campylobacter* in Irish poultry

Dr Declan J. Bolton

Campylobacter is a major health issue for poultry meat. Research at Teagasc Food Research Centre (Ashtown) on *Campylobacter* prevalence at first and second thinning and on growth rate in the ceca, published in the *Journal of Applied Microbiology* (2014, 17(3), 876-881), demonstrated immediate spread throughout the flock. Moreover, this work also discovered that *Campylobacter* multiply rapidly in the ceca, reaching counts of 100 million organisms per gram within three to four days. This has necessitated a revision of the Food Safety Authority of Ireland (FSAI) recommendations for control of *Campylobacter*. Testing will now have to be performed on flocks immediately before slaughter and all birds harvested post first thin will be considered as heavily contaminated with *Campylobacter* and treated as high risk. These new guidelines, which will be implemented in 2015, will help to reduce the prevalence of *Campylobacter* on Irish poultry.



Image courtesy of Melissa Brower, Centers for Disease Control, USA

OTHER CONTRIBUTORS AND COLLABORATORS

University College Dublin, Carton Brothers Ltd.
and the Food Safety Authority of Ireland.

FUNDING

Teagasc grant-in-aid

Solving the protein problem in malting barley

Dr Richie Hackett



OTHER CONTRIBUTORS AND COLLABORATORS

Scottish Rural College (SRUC), Teagasc KT specialists and tillage advisors, private sector advisors, 50 growers from around the country who were involved in a survey of farmer practice.

FUNDING

Teagasc grant-in-aid.

Prior to the research malting barley growers were experiencing considerable problems in producing malting barley with protein levels that met the required market specification. The research identified fertilizer N strategies that maximise the probability of achieving required protein levels without compromising yields. Implementation of these strategies at farm level (through the Teagasc KT specialists and tillage advisors, as well as private sector advisors) has reduced problems with unsuitable protein levels. The work also found that seasonal factors, outside the control of the grower, had a significant part to play and this knowledge has contributed to the development, by the malting industry, of markets for barley that inevitably fails to meet the normal malting specification.

Developing white clover varieties

Dr Patrick Conaghan

Teagasc has been breeding white clover for over 50 years at Oak Park, Carlow. Chieftain, Avoca, Susi, Tara and Aran, are some of the successful and well-known Teagasc-bred varieties. In 2014, Iona, a medium-leaf size variety, offering outstanding early season growth, was released. Three further white clover varieties – Buddy, Coolfin and Dublin – are currently undergoing seed increase and are scheduled for release in 2015, 2017 and 2018, respectively. Although a medium leaf size variety, Buddy offers exceptional persistency and ground cover, under tight grazing, comparable to a small leaf size variety. Coolfin, a small leaf size variety, is the highest yielding white clover variety in the Ireland Recommended List trials. Dublin is a large leaf variety offering further improvements in yield and persistency, and hence greater choice for farmers looking for a variety suitable for grazing and cutting.



OTHER CONTRIBUTORS AND COLLABORATORS

University of Wisconsin-Madison, US.

FUNDING

Goldcrop Ltd, DLF-Trifolium and Teagasc grant-in-aid.

RESEARCH PROGRAMMES

The Teagasc mission is to support science-based innovation in the agri-food sector and wider bio-economy that will underpin profitability, competitiveness and sustainability.

This is achieved through the close coupling of research and knowledge transfer in four programme areas:

- **Animal & Grassland Research and Innovation**
- **Crops, Environment and Land Use**
- **Food**
- **Rural Economy and Development**

Each of these programmes is composed of research, development and knowledge-transfer/industry-development departments, as outlined below. Research is conducted at seven dedicated locations, while knowledge transfer professionals are located throughout the country (see map opposite).

Our annual research portfolio comprises some 350 research projects, carried out by 500 scientific and technical staff in our research centres throughout Ireland.

In order to maximise the impact of our research, Teagasc actively collaborates with research organisations across the world. This collaboration stretches from individual projects and publications right up to formal alliances and partnerships.

ANIMAL & GRASSLAND RESEARCH AND INNOVATION PROGRAMME

Departments

- Animal & Bioscience Research
- Grassland Science Research
- Livestock Systems Research
- Pig Development
- Dairy Knowledge Transfer
- Drystock Knowledge Transfer

Locations

- Athenry, Co. Galway
- Grange, Dunsany, Co. Meath
- Moorepark, Fermoy, Co Cork

CROPS, ENVIRONMENT AND LAND-USE PROGRAMME

Departments

- Crops Research
- Agri-Environment Research
- Forestry Development
- Horticulture Development
- Agricultural Catchments
- Crops Knowledge Transfer
- Environment Knowledge Transfer

Locations

- Johnstown Castle, Co. Wexford
- Oak Park, Co. Carlow
- Kinsealy/Ashtown, Dublin

RURAL ECONOMY AND DEVELOPMENT PROGRAMME

Departments

- Agricultural Economics and Farm Surveys Research
- Spatial Analysis, Food Marketing and Agri-Innovation Research
- Farm Management and Rural Development Knowledge Transfer

Locations

- Ashtown, Dublin 15
- Athenry, Co. Galway

FOOD PROGRAMME

Departments

- Food Biosciences Research
- Food Safety Research
- Food Chemistry & Technology Research
- Food Industry Development

Locations

- Ashtown, Dublin 15
- Moorepark, Fermoy, Co. Cork



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