Agriculture and
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Authority

Teagasc in Europe 2007–2013

Highlights of Teagasc participation in European Union-funded research and innovation projects 2007–2013

Teagasc

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Teagasc would like to acknowledge the assistance of the Irish FP7 National Support Network. The financial assistance provided to project coordinators and partners by Enterprise Ireland, and the skills, expertise and dedication of the National Contact Points and National Delegates, were vital in helping to secure funding for many of the projects listed in this publication.

Compiled and edited by Dr. Raymond Kelly

Foreword

Teagasc is the state agency responsible for research, extension and education in agriculture and food in Ireland. Our 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:

Professor Gerry Boyle
Director, Teagasc

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

This report highlights a selection of the European research projects in which Teagasc has been involved between 2007 and 2013. The individual project summaries reflect the diverse range of instruments funding European research during this time, from Framework Programmes 6 and 7 (including large collaborative projects, Marie Curie individual fellowships and Research for SME Associations), the InterReg programme and the LIFE programme.

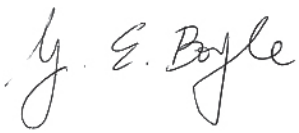
The grand challenges that we face, such as food security and climate change cannot be tackled at a national level. It is clear that as a funder and performer of research, seeking maximum impact and maximum value, we must link with European partners to reduce fragmentation and duplication of effort. This is why Teagasc is actively engaged in the Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI) and a number of ERA-NETs.

Teagasc was a very active participant in EU programmes over the last seven years, securing almost €12 million from FP7 awards, and having a very satisfactory success rate of 27% in funding applications. Most of these applications were in the thematic area Food, Agriculture and Fisheries, and Biotechnology and contributed to making this one of Ireland's most successful thematic areas in FP7, receiving 2.24% of the overall funding awarded. One of the most striking aspects of European research is the huge multiplier effect. The research undertaken in Teagasc resulting from our direct funding allocation is just one output from a European project. In fact, as an integrated research and knowledge transfer organisation, the real value lies in access to the expertise and results of the entire consortium. In Framework Programme 7, for every Euro allocated to Teagasc, the organisation had access to nineteen Euro worth of research.

Success in competing for European funding is built on the consistent investment that the government – principally through the Department of Agriculture, Food and the Marine, but also through Science Foundation Ireland, Enterprise Ireland, the Irish Research Council and the Environmental Protection Agency – has made in Teagasc over the last ten years. These investments have allowed Teagasc to recruit excellent researchers, to build expertise and to improve infrastructure.

The Innovation Union flagship initiative and the new Horizon 2020 Framework Programme for Research and Innovation emphasise innovation; cooperation between science and business; and involvement of all actors across the research and innovation chain. As an organisation that combines research and knowledge transfer activities in order to deliver science-based innovation, Teagasc strongly welcomes this focus.

Building on our achievements over the last seven years, we aims of the Innovation Union flagship initiative by cooperating with our European colleagues at the level of funding body and research performer, as an organisation that has much to learn from our partners and one with much knowledge, expertise and experience to share.



Professor Gerry Boyle
Director, Teagasc

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Project number:
5705

Funding source:
FOOD-CT-2006–36241

Project dates:
Mar 2007 – Dec 2012

Teagasc project team:

Dr. Geraldine Duffy (Coordinator)

Dr. Martin Danaher

Dr. Declan Bolton

Dr. Kaye Burgess

Collaborating Institutions:

University College Dublin; University College Cork (Ireland)

Institut National de la Recherche Agronomique (France)

Aberystwyth University; University of Bristol; Queen's University Belfast; British Nutrition Foundation (UK)

Nofma Mat AS; The Norwegian Food Research Institute (Norway)

Agricultural University of Athens; Aristotle University of Thessaloniki (Greece)

Ghent University (Belgium)

Agricultural University of Poznan (Poland)

University of Veterinary Medicine Austria; International Atomic Energy Agency (Austria)

Aarhus School of Business; Danish Meat Research Institute (Denmark)

RIKILT Institute of Food Safety (The Netherlands)

University of Novi Sad (Serbia & Montenegro)

Institute of Agro-Food Research and Technology (Spain)

Universidad Federale de Sao Paulo; Universidade de Sao Paulo (Brazil)

USDA, Western Regional Research Centre (US)

University of Guelph (Canada)

Institute of Environmental Science and Research (New Zealand)

Advancing Beef Safety and Quality through Research and Innovation (ProSafeBeef)

Industry Impact:

- New technologies for anthelmintic drug residues were developed which can be used to monitor beef and underpin the safe image of EU beef, ensuring consumer confidence and safeguarding international trade for the sector.
- The risk assessment showed that the risk posed by microbial pathogens in EU beef is low. Nonetheless the study showed that the hide was an important vehicle of microbial pathogen contamination into the abattoir and would thus be a key target for risk reduction measures
- This research underpins the safe image of EU beef, ensuring consumer confidence and safeguarding international investment in the sector.

Key external stakeholders:

Beef sector, regulators, Food Safety Authority of Ireland.

Outputs:

- A new technology for anthelmintic drug residues was developed and is now in use by the Irish national reference laboratory where it is used for the control and monitoring of food of animal origin for such residues according to EU legislation. This technology has also been transferred to a number of EU laboratories, thus harmonising the approach of residue control for beef consumed by EU consumers, helping to ensure beef and food safety.
- In Ireland, the project supported the training of 4 PhD students to completion and 4 post doctoral researchers for periods of 3 (n=2) to 5 years (n=2).

Improving regional prosperity through better resource utilization on dairy farms and stakeholder cooperation (DAIRYMAN)

Project number:
6012
Funding source:
InterReg IVB NWE 096D
Project dates:
Sep 2009 – Sep 2013

Teagasc project team:
Dr. James Humphreys
Mr. Andy Boland
Mr. John Upton
Dr. Paul Murphy
Ms. Elena Mihailescu
Dr. Ming-Jia Yan

Collaborating Institutions:
Wageningen UR (Lead partner, The Netherlands)
Agri-Food and Biosciences Institute (UK)
Institut de l'Elevage; Chambre Régionale d'Agriculture de Bretagne; Chambre Régionale des Pays de la Loire; Chambre Régionale d'Agriculture du Nord Pas-de-Calais (France)
Institute for Agricultural and Fisheries Research – ILVO; Hooibeekhoeve; CRA Wallon (Belgium)
LAZBW Aulendorf (Germany)
Lycée Technique Agricole (Luxembourg)

Industry Impact:

The key questions in the dairyman project were (i) how sustainable are the farms that produce our milk and (ii) what can be done to improve the sustainable image of these farms. Many aspects of sustainability were measured including economic performance, nutrient use efficiency, carbon footprint, energy use and biodiversity. Models and tools for assessing the sustainability of farms developed during the project are now being used across the EU, and are being used in the development of the Bord Bia quality assurance program for dairy farms in Ireland. There has been a spin-off farm improvement project between Teagasc and Carbery Group using the methodology developed during the Dairyman project. Data on farm-gate P balances from the project was used in a science-based submission made by Teagasc as part of a review of Ireland's Nitrates Action Programme in 2013, which resulted in a science-based increase in P fertilization allowances on farms. The key message for Irish dairy farmers is to continue to focus on low-cost grazed-grass based dairy production in order to ensure the economic and environmental sustainability of their farms.

Key external stakeholders:

Dairy farmers, farmers unions, dairy processors, environmental agencies, policy makers, extension services, research organisations.

Outputs:

- An international comparison of the sustainability of dairy production on farms in the northwest of Europe
- In Ireland, two PhD students trained to completion, one more student due to complete in September 2014; two contract researchers collectively gained six years' experience and training.

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Project number:
5791

Funding source:
FP7 KBBE 211708

Project dates:
Apr 2008 – Jan 2012

Teagasc project team:

Dr. Donagh Berry

Dr. Sinead McParland

Dr. Linda Giblin

Collaborating Institutions:

Wageningen UR (Coordinator, The Netherlands)

Scottish Agricultural College/Scotland's Rural College (UK)

University of Liege (Belgium)

Swedish University of Agricultural Sciences (Sweden)

Irish Cattle Breeding Federation (Ireland)

Innovative and practical breeding tools for improved dairy products from more robust dairy cattle (RobustMilk)

Industry Impact:

- Developed the tool to accurately predict milk fatty acid content which is in the process of being implemented in most of the ROBUSTMILK partner countries.
- Generated an international database of novel phenotypes which has since been used to estimate animal measures of genetic merit for novel traits like feed intake and fertility.

Key external stakeholders:

The Irish Cattle Breeding Federation (ICBF), international breeding industry, milk processors and national dairy boards, dairy farmers, international genetic evaluation bodies, international geneticists, nutritionists and other scientists.

Outputs:

- Developed an international database for difficult to measure traits such as feed intake, which is being used to develop international genetic and genomic evaluations.
- Clearly demonstrated that the saturated fatty acid content in milk can be very accurately predicted using infrared spectroscopy, ensuring rapid implementation nationally.
- Demonstrated the ability of infrared spectroscopy of milk to predict body energy status.
- Demonstrated that both predicted milk quality and energy status exhibit exploitable genetic variation.
- Developed sophisticated statistical models for the analysis of udder health.
- Identified regions of the bovine genome associated with a range of performance traits including milk production, the feed intake complex, fertility and milk quality.
- Improved genomic selection algorithms to facilitate the joint inclusion of both cow and sire DNA information.
- In Ireland, the project supported the training of one post-doctoral researcher.

BurrenLIFE

Project number:
5829

Funding source:
EU LIFE and national co-funding

Project dates:
Sep 2004 – Aug 2009

Teagasc project team:

Dr. James Moran
Mr. Denis Kelleher
Ms. Anne Kinsella
Mr. Sean Regan
Mr. Declan Murphy
Mr. Tom Shanahan
Mr. Gerard McMahon
Internal Teagasc Advisory Group

Collaborating Institutions:

National Parks and Wildlife Service (Project Sponsor)
Burren Irish Farmers' Association

Industry Impact:

- BurrenLIFE developed best-practice guidance for management of livestock in high nature value systems.
- Based on evidence from the BurrenLIFE project, the Burren Farming for Conservation Programme (BFCP) was launched by the Irish Department of Agriculture, Food and the Marine (DAFM) in 2010, providing payments to farmers of about €1,000,000 per year. By 2013, over 14,500 ha of Special Areas of Conservation (SAC) were covered by the BFCP, covering about 46% of the Burren SAC area.
- BurrenLIFE has directly informed the expansion of Targeted Output Based Agri Environmental Projects in the planned Irish Rural Development Programme 2014–2020, including an expansion of the Burren Farming for Conservation Programme.
- The above aspects combine to help protect farmland of existing high wildlife value, and incentivise management to improve the wildlife value of other areas.

Key external stakeholders:

Environmental NGOs, farmers in High Nature Value farming systems, Irish policymakers, EU policymakers.

Outputs:

- The introduction of customised concentrate-based feeding systems led to a 61% reduction in the amount of silage fed on the project farms.
- New grazing regimes resulted in a doubling in the area of grassland being grazed.
- Scrub was controlled on c.100 ha of priority habitat and c.54km of animal access paths were opened or restored to aid livestock movement and herding.
- In 2010, BurrenLIFE was selected as one of the "Best of the Best" LIFE Nature projects in Europe.
- The project has been highlighted as an example of a successful multi-actor project/operational group to guide future European Innovation Partnership projects.

Solutions for the mushroom industry to emerging disease threats from trichoderma and virus (MushTV)

Project number:
6270
Funding source:
FP7 Res4SME 286836
Project dates:
Jan 2012 – Dec 2014

Teagasc project team:
Dr. Helen Grogan (Coordinator)
Dr. Caoimhe Fleming-Archibald
Ms. Angela Ruggiero
Mr. Brian McGuinness.

Collaborating Institutions:
Grower organisations:
Commercial Mushroom Producers Cooperative Society Ltd (Ireland)
Agriculture and Horticulture Development Board (UK)
Vereniging Onafhankelijke Champignontelers (Belgium)
Cooperatie Funghi UA; Coöperatieve Nederlandse Champignonk-wekersvereniging UA (The Netherlands)
Stowarzyszenie Branzy Grzybow Uprawnych (Poland)
Industry partners:
Custom Compost Ltd.; Monaghan Mushrooms Ireland; International Mushrooms Ltd – Sylvan Ireland; CIRCA Group Europe Ltd (Ireland)
NV Karel Sterckx (Belgium)
Hooymans Compost BV (Netherlands)
Research providers:
Teagasc (Ireland)
Agrifood and Biosciences Institute & East Malling Research (UK)
Inagro (Belgium)
Stichting Dienst Landbouwkundig Onderzoek – PRI (Netherlands).

Industry Impact:

- The results from this project will enable the mushroom industry to remain efficient and profitable while complying with EU pesticide and biocide legislation.
- Interim results have identified weaknesses in the effectiveness of disinfectants against pathogens. Industry partners have taken this on board and revised hygiene protocols are being prepared.
- Composters and growers are more aware that MVX viruses can be detected in mushroom compost using the robust diagnostic tests developed in this project and they are requesting this service.
- Outputs from this project will provide key information to use in an integrated pestmanagement (IPM) system that will comply with the Sustainable Use Directive (SUD).

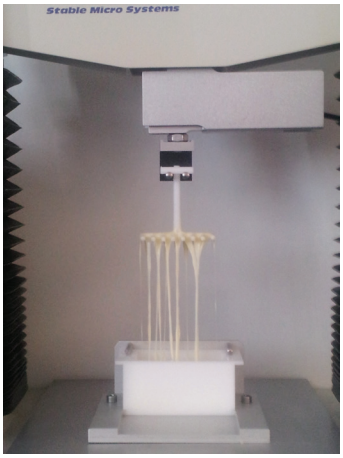
Key external stakeholders:

Mushroom growers, compost producers, spawn companies, casing suppliers and scientists.

Outputs:

- Surveys, experiments and diagnostics have provided a better understanding of how *Trichoderma aggressivum* and MVX infect crops and spread around the industry.
- The MVX complex has been shown to contain 16 individual RNA viruses "new to science".
- Technical factsheets and seminars are planned for Winter 2014. Topics include "New technologies to detect *Trichoderma* and Virus" and "Understanding and controlling disease outbreaks".
- Improved molecular diagnostics for MVX in compost have been developed.
- In Ireland (Teagasc), one postdoctoral researcher and one molecular technician will have collectively gained six years' experience in applied mushroom science.

Novel Processing approaches for the development of food products Low in fAt, Salt and sUgar (PLeASURe)



Project number:
6287

Funding source:
FP7 KBBE 289536

Project dates:
Dec 2012 – Nov 2014

Industry Impact:

- The implications of PLEASURE include the availability of technological solutions resulting in foods low in fat, salt and sugar that can be implemented by industry, sensory optimisation, evaluation of the acceptance of the new products by consumers, including labelling issues and affordability, and estimation of the impact of the reformulation on the overall nutrient intake of consumers.
- Overall, this brings the potential to have new 'reduced in' composite foods for categories such as pizza, providing improved nutrition to EU consumers and ingredient opportunities for industry suppliers.

Key external stakeholders:

European Commission on behalf of its 300m+ consumers; EU food processors; Irish food industry; Irish consumers.

Outputs:

- Teagasc cheese researchers are succeeding with the development of technological adaptations to enable 30% reduction in both fat and salt content of Mozzarella-style cheese without unduly compromising desired stretch and flow characteristics expected during pizza preparation.
- One PhD student has been supported at Teagasc by the PLEASURE project.
- The project also complements the national cheese research project 'CheeseBoard 2015' where similar reduction targets are set for Cheddar cheese.
- At the overall project level the original objectives are largely being met i.e. by generation of technological solutions to simultaneously reduce the content of salt (sodium), fat (saturated and trans-fatty acids) and/or sugar (mono – and disaccharides) in processed food products (priority food categories being addressed include: bakery products, meat products, cheeses and ready-to-eat meals) while ensuring food safety and quality and maintaining taste experience and pleasure.

Teagasc project team:

Prof. Tim Guinee
Dr. Phil Kelly
Dr. Kieran Kilcawley
Ms. Sarah Henneberry

Collaborating Institutions:

Biozoon GmbH (Coordinator); Deutsches Institut fuer Lebensmitteltechnik; Hochschule Weihenstephan-Triesdorf (Germany)

TRITECC SRL (Romania)

RLabs Ltd. (Greece)

Promatec Food Ventures BV; Sleegers Quality Meat Products (The Netherlands)

VMI SA; Ecole Nationale Veterinaire, Agroalimentaire et de l'alimentation Nantes Atlantique; Alsacienne de Pates Menageres SAS (France)

University College Cork; PLC ingredients Ltd. (Ireland)

MahnMac Delicatessen SL; Productos Naturales de la Vega SL; AZTI Fundazioa (Spain)

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Project number:
6057
Funding source:
FP7 KBBE 245301
Project dates:
May 2010 – Apr 2014

Enhancing the innovativeness of food SME's through the management of strategic network behaviour and network learning performance (NETGROW)

Teagasc project team:
Dr. Maeve Henchion
Dr. Douglas Sorenson

Collaborating Institutions:
Ghent University (Coordinator, Belgium)
Instituttet for Fødevarestudier & Agroindustriel Udvikling (Denmark)
Institut Polytechnique LaSalle Beauvais (France)
University of Bonn (Germany)
University of Debrecen (Hungary)
University of Bologna (Italy)
Food Valley NL (Netherlands)
Skane Food Innovation Network (Sweden)

Industry Impact:

Networking with other businesses and organisations can help SMEs develop their operations and adopt innovative practices, thereby contributing to their competitive position and growth. Adoption of the NetGrow Tools (based on the research conducted within the project) will support SMEs to engage in strategic network behaviour. It will help network managers to align network activities to member goals and expectations. Finally, it will inform the design of policy initiatives to create a supportive networking environment.

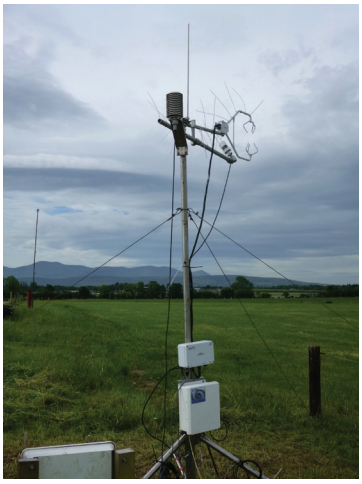
Key external stakeholders:

Food SMEs (and their suppliers and customers), network managers, policy makers in innovation and learning, food enterprise support agencies, researchers and research institutes.

Outputs:

- NetGrow Toolbox (will be available at www.netgrow.eu).
- Network Learning Day in Brussels on 10th of April 2014 for launch and demonstration of the Network Tools.
- Additional services will be provided by one NetGrow SME partner (Instituttet for Fødevarestudier & Agroindustriel Udvikling in Denmark) to support SMEs and network organisations in using the network tools.
- 4 electronic project newsletters sent to wide range of stakeholders with research updates, news and events.
- Stakeholder workshops (including international workshops in Bonn, and in Bologna with participation by Enterprise Ireland).
- International conference papers and papers submitted to peer reviewed journals (under review).
- In Ireland, one post-doc gained 3.5 years' experience.
- Potential new collaboration for Teagasc crops researchers.

AN Integration of Mitigation and Adaptation options for sustainable Livestock production under climate CHANGE (ANIMALCHANGE)



Project number:
6115
Funding source:
FP7 KBBE 266018
Project dates:
Mar 2011 – Feb 2015

Industry Impact:

The project will design an integrated and consistent mitigation and adaptation policy framework for the livestock sector as well as region-specific farming solutions for Europe and the wider global livestock sector. This will help to reduce emissions and simultaneously provide increased economic and production resilience to future climate change.

Key external stakeholders:

Livestock farmers (Europe, New Zealand, Africa, Brazil), policymakers, general public and farm advisory services.

Outputs:

- The development of breakthrough technologies for adaptation and mitigation to climate change for livestock systems (dairy, beef, sheep and pigs).
- A regionalised assessment of the potential vulnerability of European animal production to future climate change in terms of
  a) production
  b) economic sustainability and
  c) emissions of greenhouse gases.
- In Ireland, this project has trained two PhD students. In addition, two post-doctoral researchers will have collectively gained six years of experience and training.

Teagasc project team:
Dr. Gary Lanigan
Dr. Frank O'Mara
Dr. Laurence Shalloo
Dr. John Finn
Dr. Orlaith Ni Choncubhair
Mr. Eamonn Haughey
Mr. Francesco Rubino
Dr. Matthew McCabe

Countries Represented:
France (Coordinator)
Austria
Belgium
Denmark
Ireland
Italy
Portugal
Spain
Switzerland
The Netherlands
United Kingdom
Kenya
Senegal
South Africa
Tunisia
Brazil
New Zealand

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Project number:
6020

Funding source:
FP7 KBBE 244983

Project dates:
Mar 2010 – Feb 2014

Multi species swards and multi scale strategies for multifunctional grassland based ruminant production systems (MULTISWARD)

Industry Impact:

- Increased awareness of economic, environmental and ecological benefits of grassland based ruminant production systems.
- Reinforce the competitiveness of grassland based ruminant production systems.

Key external stakeholders:

Farmers, scientific community, postgraduate students, advisors, policy makers, animal breeders, land users, general public, grassland industry, grass and clover breeders.

Outputs:

- Innovative grassland management techniques, e.g. incorporation of white clover into grassland swards, extended grazing and on/off grazing.
- Information on stakeholder perception of the importance of grassland.
- Information on the importance of selecting the correct animal for grassland based systems.
- Increased collaboration with partner institutes.
- Scientific publications; conference papers and abstracts; PhD theses.
- In Ireland three PhD students were trained to completion and one post-doctoral researcher gained one years' experience and training.

Teagasc project team:
Dr. Deirdre Hennessy
Dr. Laurence Shalloo
Dr. Pat Dillon
Dr. Fiona Thorne
Dr. Emer Kennedy
Dr. Eva Lewis
Dr. Frank Buckley
Dr. Donal O'Brien
Dr. Michael O'Donovan
Dr. James Humphreys
Mr. Daniel Enriquez-Hidalgo
Mr. Patrick Gillespie
Dr. Cristina Hurtado-Uria
Mr. Fergal Coughlan
Mr. Ricki Fitzgerald

Collaborating Institutions:
INRA (Coordinator); INRA Transfert; Institut de l'Elevage (France)
AU-IBER (Wales)
Agroscope and FiBL (Switzerland)
Poznan University of Life Sciences (Poland)
Norwegian Institute for Agricultural and Environmental Research; Norwegian University of Life Sciences (Norway)
Stichting Dienst Landbouwkundig Onderzoek (The Netherlands)
Universität Göttingen (Germany)
Vlaams Gewest – Flemish region of Belgium; Natural Resources, Human Environment and Agronomy Bureau (Belgium)
Università degli studi di Udine (Italy)

Innovative and sustainable systems combining automatic milking and precision grazing (AUTOGRASSMILK)

Project number:
6337

Funding source:
FP7 Res4SME 314879

Project dates:
Jan 2013 – Dec 2015

Teagasc project team:

Dr. Bernadette O'Brien (Coordinator),

Dr. Cathriona Foley

Collaborating Institutions:

Irish Grassland Association (Ireland)

Wageningen UR; Noord, Land – en Tuinbouw Organisatie Noord (Netherlands)

Aarhus University; VFL – Knowledge Centre for Agriculture (Denmark)

Institut de l`Elevage; CNIEL – Centre national interprofessionnel de l`économie laitière (France)

Swedish University of Agricultural Sciences; VAXA (Sweden)

Universite de Liege; Comité du lait (Belgium)

End user farmers (Ireland and Denmark)

Industry Impact:

- The AUTOGRASSMILK project seeks to address the challenge of combining automated milking (AM) systems with grazing. It will provide a management system and range of guidance that will address the different circumstances in the participating countries and, thus enable dairy farmers to optimise milk output from AM with increased quantities of grazed grass in the diet. This will have a positive impact on milk quality, environmental footprint and animal welfare standards.
- This model would allow expansion of milk production units within the current land base structure, where the purchase /leasing of adjacent land is limiting (very important in Ireland).
- AM can make dairy farming a more attractive occupation due to reduced physical labour.
- AM has the potential to improve automatic data collection. This will allow a greater degree of individual cow management. Together with increased focus on grass utilization, this should result in increased profitability.

Key external stakeholders:

Farmers within the project participating countries, the larger group of European farmers, the members of the participating small medium enterprise (SME) Associations (for example, Irish Grassland Association in Ireland), policymakers, milking machine companies and dairy related manufacturing companies.

Outputs:

- Successful integration of AM into a grass based milk production system has been achieved on the research farm in Ireland over 2013 and further work on milking frequency, grass allocations, breed, animal behavior, and energy and water consumption is in progress.
- Papers and presentations at National Dairy Conference, Ireland; Irish grassland Association Conference, Ireland; Agricultural Research Forum, Ireland; ECPLF (Leuven, September, 2013); ISAE (abstract submitted) (2014).
- Technical paper in T-Research, Ireland.
- In Ireland, one PhD student will be trained to completion on this project. It will contribute (approximately 20%) to the work of a further PhD student. Additionally, one post-doc will gain approximately 3 years of experience and training on it.

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Project number:
6179

Funding source:
FP7 KBBE 289461

Project dates:
Oct 2011 – Sep 2015

Enhancing biomass production from marginal lands with perennial grasses (GrassMargins)

Teagasc project team:
Dr. Susanne Barth
Dr. John Finnan
Dr. Manfred Klaas
Mr. Brendan Burke
Mr. Peter Gaskin
Dr. Peter Meehan

Collaborating Institutions:
Trinity College Dublin; Circa Group (Ireland)
Tinplant GmbH (Germany)
DLF Trifolium; Aarhus University (Denmark)
Chinese Academy of Sciences (China)
Novosibirsk University (Russian Federation)
Alnarp University (Sweden)
Poznan University (Poland)
Knowledge Now Ltd.; University of Sheffield.

Industry Impact:

- Partners of the GrassMargins project have studied factors which affect biomass production on marginal lands, including the relative merits of grass mixtures versus mono-species, and the factors affecting plant moisture levels for drying of biomass.
- Bioenergy produced from marginal lands can be exploited without undue conflict with food production.

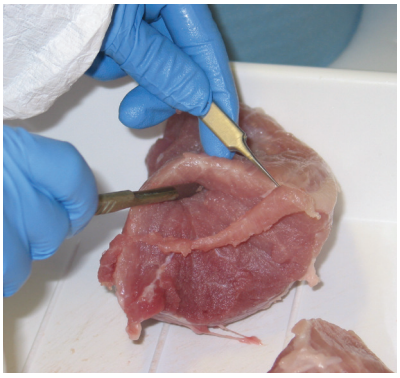
Key external stakeholders:

Farmers, plant breeders, policy makers, public domain.

Outputs:

- A database of geographically referenced information on grass species for biomass production has been produced.
- Genotypes within species have been identified with a better adaption to adverse environmental conditions such as flooding, drought, cold and salinity at a range of European sites.
- The benefits of grass species mixtures to stabilise yield has been investigated and growth protocols have been developed.
- Work on optimal drying conditions of biomass to produce improved application protocols is underway.
- Novel Miscanthus breeding materials have been developed.
- Genetic resource collections of *Phalaris arundinacea* and *Dactylis* were made in Ireland, the UK, Poland, Germany, Denmark and Sweden and a protocol for next generation sequencing genotyping of the project species has been developed.
- In Ireland, 1 PhD student has been trained to currently 2½ years, 1 field technician has been employed for 2 years and 1 senior PostDoctoral researcher has been employed for 3½ years.

Biomarkers for post market monitoring of short and long-term effects of genetically modified organisms (GMOs) on animal and human health (GMSAFOOOD)



Project number:
5822

Funding source:
FP7 KBBE 211820

Project dates:
Aug 2008 – Sep 2012

Teagasc project team:

Dr. Peadar Lawlor
Dr. Maria Walsh
Dr. Stefan Buzoianu
Dr. Mary Rea
Dr. Paul Ross
Dr. Paul Cotter
Mr. Tomas Ryan

Collaborating Institutions:

Medical University of Vienna (Coordinator, Austria)
Commonwealth Scientific and Industrial Research Organisation (Australia)
Norwegian School of Veterinary Science (Norway)
Central Food Research institute (Hungary)
Troyka, Techno-Park of the Middle East Technical University (Turkey)
Waterford Institute of Technology;
University College Dublin (Ireland)

Industry Impact:

The results of this project informed all relevant stakeholders regarding the safety of the GM feed ingredients tested which allowed their continued safe use in pig diets. This was particularly important for the Irish pigmeat sector where food safety and the wholesomeness of its product are of paramount importance.

Key external stakeholders:

EU Commission, farmers, feed compounders, EFSA, FSAI, consumers, policymakers, agricultural advisers.

Outputs:

- Bt MON810 did not have harmful effects on growth, intestinal health or organ function of pigs.
- Bacteria within the digestive systems of pigs are tolerant of the GM maize.
- The *cry1Ab* gene as well as the protein itself did not migrate from the digestive tract and the gene was broken down as it progressed through the digestive tract.
- Feeding GM maize to pigs of different ages and for extended periods of time is as safe as its conventional counterpart with respect to potential effects on animal health.
- In a 30 day feeding study using weaned pigs, GM α-amylase inhibitor (αAI) peas were as safe as their conventional counterpart with respect to potential effects on animal health.
- Multiple conventional comparators should be used during safety assessment of GM ingredients.
- In Ireland, one post-doctoral researcher and one PhD student were trained to completion and collectively gained 8 years' experience on this project.

Agriculture and Food Development Authority

Selection and improving of fit-for-purpose sampling procedures for specific foods and risks (BASELINE)

Project number:
5994

Funding source:
FP7 KBBE 222738

Project dates:
Aug 2009 – Nov 2013

Teagasc project team:

Dr. Geraldine Duffy
Dr. Kieran Jordon
Dr. Uma Tiwari
Dr. Des Walsh

Collaborating Institutions:

University of Bologna (Coordinator);
Istituto Superiore Di Sanita, Rome (Italy)

Universidad De Cordoba;
Universidad De Navarra;
Universidad De Lleida;
Centro Nacional De Tecnología Y Seguridad Alimentaria (Spain)

University of Zagreb-Faculty of Veterinary Medicine (Croatia)

National Veterinary Institute (Norway)

Universite De Bretagne Occidentale;
Agence Francaise De Securite;
Sanitaire Des Aliments (France)

University of Copenhagen (Denmark)

Hungarian Food Safety Offce (Hungary)

Industry Impact:

The study showed that growth kinetic models can facilitate prediction of *L. monoctytogenes* growth during shelf-life and will help to demonstrate compliance with food safety criteria (EC 2073/2005). Further, the quantitative risk assessment conducted based on a farm-to-fork approach also showed possible cross-contamination of raw milk at farm level and retail level. Such model predictions, will allow food processors and policy makers to identify the possible routes of contamination in cheese processing and to reduce the risk posed to human health.

Key external stakeholders:

Dairy industry, European Food Safety Authority (EFSA).

Outputs:

- The study focused on the risk posed by *Listeria monocytogenes* in raw and pasteurised milk cheese. The study showed that *L. monocytogenes* grew at a faster rate on pasteurised milk cheese compared to raw milk cheese during the storage period following ripening.
- A quantitative risk assessment model predicting the growth and survival of *Listeria monocytogenes* in raw and pasteurised milk cheese, from farm to fork showed that the mean level of exposure to *L. monocytogenes* in contaminated cheese was higher for raw milk cheese (2.22 log10 cfu g-1) compared to pasteurised milk cheese (<1 log10 cfu g-1).
- This model can support food processors to optimise conditions to reduce *L. monocytogenes* growth in cheese and to comply with EC2073/2005.
- In Ireland, this project supported the training of two post-doctoral researchers for 3 and 2 years respectively.

Comparative Analysis of Factor Markets for Agriculture across the Member States (Factor Markets)

Project number:
6062

Funding source:
FP7 KBBE 245123

Project dates:
Sep 2010 – Aug 2013

Industry Impact:

The results of this study will contribute to a better understanding of the fundamental economic factors affecting EU agriculture, thus allowing better targeting of policies to improve the competitiveness of the sector across the EU.

Key external stakeholders:

Policy makers, international organisations, the business community, academics and the public at large.

Outputs:

- The key issues and developments on each factor market in EU Member States and Candidate Countries were identified.
- Factor-specific theoretical frameworks were developed.
- Models were developed for all three factor markets to analyse the impact and interaction of the factor markets with policies under various scenarios.
- A series of Working Papers presenting insights at various stages of the project progress including technical results and analytical issues.
- A final Book including the results and policy recommendations coming out of the network's activities.
- A number of Journal Articles.

Teagasc project team:

Mr. Trevor Donnellan

Dr. Kevin Hanrahan

Dr. Thia Hennessy

Collaborating Institutions:

Centre for European Policy Studies (Coordinator, Belgium)

Leibniz Institute of Agricultural Development in Central & Eastern Europe, Technical University of Munich, Johann Heinrich von Thünen-Institut (Germany)

Institut National de la Recherche Agronomique (France)

Centre of Planning & Economic Research (Greece)

Stichting Dienst Landbouwkundig Onderzoek (The Netherlands)

MTT, Agrifood Research Finland (Finland)

Slovak Agricultural University in Nitra (Slovakia)

Swedish University of Agricultural Sciences (Sweden)

University of Milan; Alma Mater Studiorum Università di Bologna; Cattolica University del Sacro Cuore (Italy)

University of Kent (UK)

University of Primorska (Slovenia)

University of Warsaw (Poland)

Dietary fibers supporting gut and immune function – from polysaccharide compound to health claim (FibeBiotics)

Project number:
6301

Funding source:
FP7 KBBE 289517

Project dates:
Jan 2012 – Jun 2017

Teagasc project team:

Prof. Catherine Stanton

Prof. Paul Ross

Mr. Paul Ryan

Dr. Lis London

Collaborating Institutions:

Dienst Landbouwkundig Onderzoek (Coordinator); Wageningen University; BioActor B.V.; R-Consultancy; Winclove BioIndustries BV (The Netherlands)

Nofma AS; Genetic Analysis AS; Immitec (Norway)

Institut National de la Recherche Agronomique; Institut Pasteur (France)

Clinical Research Centre Kiel GmbH (Germany)

Örebro University; Swedish oat Fiber AB (Sweden)

ProDigest BVBA, (Belgium)

University of Aberdeen (UK)

University Bologna (Italy)

Industry Impact:

Diet has an important role in modulation of gut & immune functions and the majority of the functional food market is directed towards the gut & immune system, e.g. probiotics and prebiotics and fibers or non-digestible polysaccharides. Food fibres are considered as beneficial for our immune system. However the European Food Safety Authority needs sound scientific evidence based on effects on healthy human people before health claims for these compounds are approved. FibeBiotics is studying the effect of food fibres from various sources on the human immune system health and developing methods that accelerate similar research in the future for other immune-supporting products. Polysaccharides are also known to stimulate the 'good' bacteria in the gut and, consequently, have an indirect effect on the immune system and support maintenance of health. These effects are also being studied in the laboratory and in large-scale human trials. Other research of the EU FibeBiotics project supports product development to be sure that the final products still contain the bioactive polysaccharides and that these are not degraded or inactivated because of enzymes or other suppressors in the food matrix. By providing a mechanism to substantiate health claims, this project will facilitate innovation in the food sector.

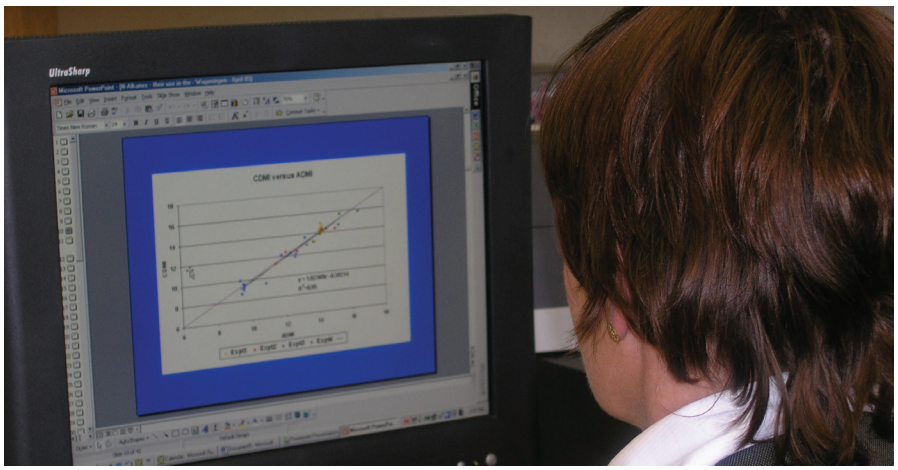
Key external stakeholders:

Food manufacturers, dairy industry, pharmaceutical companies, research communities; public health agencies and health professionals; policymakers.

Outputs:

- Substantiated health claims for dietary fibers on immune function and gut health.
- In Ireland, two PhD students will be trained.

A common data exchange system for agricultural systems (AgriXchange)



Project number:
6054

Funding source:
FP7 KBBE 244957

Project dates:
Jan 2010 – Dec 2012

Teagasc project team:

Dr. Laurence Shalloo

Ms. Anne Geoghegan

Collaborating Institutions:

Wageningen UR (Coordinator, The Netherlands)

Kuratorium für Technik und Bauwesen in der Landwirtschaft; Universität Rostock (Germany)

MTT Agrifood Research (Finland)

Wireless Info (Czech Republic)

Institut de l'Elevage (France)

Institut de Recerca i Tecnologia Agroalimentaries (Spain)

Forschungsinstitut für Biologischen Landbau (Switzerland)

Altavia (Italy)

Poznan University of Life Sciences (Poland)

ACTA Informatique (France)

Progis software (Austria)

Industry Impact:

The results of this project highlight the potential benefits of having a common data exchange system for agricultural data. This project has set the foundation for the industry to develop standards for data exchange.

Key external stakeholders:

Farmers, machinery manufacturers, software providers, breeding organisations.

Outputs:

- There is a requirement for a set of standards to be developed in relation to data exchange between groups and entities in agriculture.
- There is a disparity of ICT and internet usage across different groups and entities within different EU countries.
- There is potential for significant added value to be obtained around data from different sources in agriculture.
- There is a requirement for a common data exchange system to ensure data can be transferred and used between entities and countries across the EU.

Agriculture and Food Development Authority

Project number:
6064
Funding source:
FP7 People 252611
Project dates:
Oct 2010 – Oct 2012

Teagasc project team:
Dr. Keelin O'Driscoll
Dr. Bernadette Earley
Dr. David Lynn
Dr. Matt McCabe

Molecular and immune mechanisms underlying bovine lameness (MIMUBLKO)

Industry Impact:

- Increased understanding and awareness of the link between lameness and systemic inflammation, leading to increased susceptibility to secondary disorders.
- Confirmation of biomarkers that have potential for use in breeding programmes.

People Impact:

- Training and experience of the post-doctoral fellow that helped her obtain her current role as an animal health research officer.

Key external stakeholders:

Dairy farmers, dairy industry, Department of Agriculture, Food and the Marine (DAFM).

Outputs:

- Cows with claw horn disorders display several behavioural and physiological responses that are representative of a sickness response, indicating a lameness-associated systemic activation of the immune system. The stress hormone, cortisol, was associated with damage to the sole, as was the leukocyte profile (high neutrophil percentage, and low lymphocyte percentage).
- Demonstrated that as sole haemorrhage score increased (worsened) cows had more impaired locomotion and had higher concentrations of circulating glucose, urea and haptoglobin.
- Claw horn damage was also associated with a gene expression profle associated with activation of the immune system. Several genes were identifed that appear to be more highly expressed in cows with claw horn damage than in healthy cows.
- Increased knowledge and understanding of techniques used in molecular biology research. These skills have already allowed the post-doctoral fellow to expand her range of research interests and incorporate molecular measures into grant funding proposals.
- Increased understanding of the systemic effects of a sterile inflammatory response. This is hugely beneficial in the fellow's current role as an animal health researcher at Teagasc.

Marketable sludge derivatives from sustainable processing of wastewater in a highly integrated treatment plant (END-O-SLUDG)

Project number:
6072

Funding source:
FP7 – Env – 265269

Project dates:
Jan 2011 – Dec 2013

Teagasc project team:

Dr. Karl Richards

Dr. Owen Fenton

Dr. Emma Moynihan

Ms. Stephanie Ellis

Collaborating Institutions:

United Utilities Water PLC (Coordinator);
Cranfeld University;
Harper Adams University;
The Agriculture and Horticulture Development Board;
Carrs Agriculture Ltd.;
Sustainable Resource Solutions Ltd.;
Valsave Engineered Solutions Ltd.;
Demeter Technology Ltd.;
Scotland's Rural College (UK)

Nijhuis Water Technology b.v. (The Netherlands)

WATERLEAU Global Water Technology nv (Belgium)

Hipsitec SA;
Universidad de Oviedo;
Compañía para la Gestión de Residuos Sólidos en Asturias S.A. (Spain)

Industry Impact:

Waste water biosolids are an important source of nutrients such as nitrogen and phosphorus. The risk of microbial contamination from treated biosolid application to soil is lower than for animal manures. Research supports the exclusion of grazing animals for 20 days post biosolid application. These findings will help to facilitate the efficient recycling of treated biosolids within agricultural systems.

Key external stakeholders:

Farmers, policy makers, waste water treatment industry, the general public.

Outputs:

- Rapid reduction of biosolid pathogens (e.g. *E. coli*, *Listeria*, *Salmonella*) was observed following application to soil and by 20 days post-application soil concentrations were negligible.
- Soil mineralogical composition and pathogen type were found to affect biosolid pathogen survival.
- In Ireland, one PhD student trained to completion; one post doc who gained 3 years' training and experience.

Coordination of European Research on ICT and Robotics in Agriculture & Related Environmental Issues (ICT-AGRI)

Project number:
5977

Funding source:
FP7 ERANET 235460

Project dates:
May 2009 – Sep 2014

Teagasc project team:
Dr. Raymond Kelly
Mr. Reamonn Fealy

Participating Countries:
Denmark (Coordinator)
Belgium
Finland
France
Germany
Greece
Israel
Italy
Latvia
Malta
Switzerland
Turkey
The Netherlands
Ireland
Spain

Impact

- Closer collaboration between members of the consortium – research funding agencies and research institutes
- Less fragmentation of research due to closer collaboration and joint funding calls
- New linkages formed amongst European researchers due to use of the matchmaking tool in the Meta Knowledge Base (MKB)
- More interdisciplinary research combining agriculture and ICT researchers
- Increased profile for Teagasc and Irish research amongst our European partners

Key external stakeholders:

Farmers, ICT and agriculture researchers, manufacturers of ICT and robotics solutions for farms, policy makers

Outputs

- Strategic Research Agenda for ICT and robotics in agriculture and related environmental issues
- Meta Knowledge Base containing research postings, personal and organisational profiles and a matchmaking tool for the formation of applicant consortia.
- Mapping of existing research and existing national funding opportunities
- Two completed pan-European funding calls, funding a total of 15 research projects. One of these projects is coordinated by Teagasc (ICTGrazingTools) and Teagasc is a partner on another project (Dairy-ICT).

Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE JPI*)

Project dates:
Oct 2010 – Present

Impact

- The FACCE-JPI aims to build an integrated European Research Area addressing the challenges of agriculture, food security and climate change.
- The FACCE JPI has led to a closer working relationship between Irish and European funding agencies who are all implementing a common Strategic Research Agenda through national funding schemes and joint calls.
- A Teagasc-led initiative has resulted in greater collaboration between European funding agencies and other relevant international initiatives e.g. Global Research Alliance, CCAFS, CGIAR, FAO, etc.,
- Irish research has achieved an increased profile through our membership of this grouping,
- Irish funding agencies have increased influence on the European research agenda in this area, resulting in increased consideration being given to issues such as pasture-based production etc.

Key external stakeholders:

Farmers, Policy makers, NGOs within the project participating countries.

Outputs

- FACCE-JPI has produced a Strategic Research Agenda, identifying 5 core research themes.
- Teagasc and the FACCE JPI jointly organised the 'Great Debate on the Battle to Feed a Changing Planet' at the EuroScience Open Forum (ESOF) in Dublin in 2012.
- Mapping of ongoing and future research projects across the member countries has identified synergies, overlaps, gaps and opportunities for collaboration.
- Joint funding actions have included
  - Establishment of a knowledge hub, MACSUR (modelling European Agriculture with Climate Change for Food Security)
  - International call on mitigation (including 11 FACCE countries with US, Canada and New Zealand)
  - Joint call with the Belmont Forum on food security and land use change
  - ERA-NET Plus call on Climate Smart Agriculture
  - Joint call with the Biodiversa ERA NET.

Teagasc project team:
Dr. Frank O'Mara
Dr. Rogier Schulte
Dr. Gary Lanigan
Mr. Trevor Donnellan
Mr. Reamonn Fealy
Dr. Raymond Kelly

Dept. of Agriculture, Food and the Marine project team:
Mr. Richard Howell
Mr. Dale Crammond

Participating Countries:
Austria
Belgium
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Ireland
Israel
Italy
The Netherlands
Norway
Poland
Romania
Spain
Sweden
Switzerland
Turkey
United Kingdom

** Joint Programming Initiatives (JPI) are intergovernmental collaborations launched by the European Council to tackle grand challenges that cannot be solved adequately at a national level.*

Summary

of Teagasc participation in Framework Programme 7

A list of projects, in which Teagasc has participated, that have received funding from the European Union's Seventh Framework Programme (FP7/2007–2013) for research, technological development and demonstration.

Cooperation Programme

Food, Agriculture and Fisheries, and Biotechnology

Title	Acronym	Grant Agreement No.
Innovative and Practical Breeding Tools for Improved Dairy Products from More Robust Dairy Cattle	ROBUSTMILK	211708
Biomarkers for post market monitoring of short and long-term effects of genetically modified organisms (GMOs) on animal and human health	GMSAFOOD	211820
Mechanisms of early protective exposures on allergy development	PRO-IMMUN	211911
Development of integrated livestock breeding and management strategies to improve animal health, product quality and performance in European organic and low input milk, meat and egg production.	LOWINPUTBREEDS	222623
Design and development of realistic food models to allow a multidisciplinary and integrated approach to food quality and nutrition	DREAM	222654
Selection and improving of fit-for-purpose sampling procedures for specific foods and risks	BASELINE	222738
A common data exchange system for agricultural systems	AGRIXCHANGE	244957
Multi species swards and multi scale strategies for multifunctional grassland based ruminant production systems	MULTISWARD	244983
Comparative Analysis of Factor Markets for Agriculture across the Member States	FACTOR MARKETS	245123
Sustainable Solutions for Small Ruminants	3SR	245140
Legume-supported cropping systems for Europe	LEGUME FUTURES	245216
Enhancing the innovativeness of food SME's through the management of strategic network behaviour and network learning performance	NETGROW	245301
Protection of consumers by microbial risk mitigation through combating segregation of expertise	PROMISE	265877
AN Integration of Mitigation and Adaptation options for sustainable Livestock production under climate CHANGE	ANIMALCHANGE	266018
Safe Food for Europe – Coordination of research activities and Dissemination of research results of EC funded research on food safety	FOODSEG	266061
Innovative and sustainable strategies to mitigate the impact of global change on helminth infections in ruminants	GLOWORM	288975
Crops and ANimals TOGETHER	CANTOGETHER	289328

Food, Agriculture and Fisheries, and Biotechnology *(continued)*

Title	Acronym	Grant Agreement No.
Enhancing biomass production from marginal lands with perennial grasses	GRASSMARGINS	289461
Dietary Fibers supporting Gut and Immune Function – From polysaccharide compound to health claim	FIBEBIOTICS	289517
Novel Processing approaches for the development of food products Low in fAt, Salt and sUgar	PLEASURE	289536
Assessing and Monitoring the Impacts of Genetically modified plants on Agro-ecosystems	AMIGA	289706
Pluridisciplinary study for a RObust and sustainabLe Improvement of Fertility In Cows	PROLIFIC	311776
A whole-systems approach to optimising feed efficiency and reducing the ecological footprint of monogastrics	ECO-FCE	311794
Bright Farm by Precision Livestock Farming	EU-PLF	311825
Protecting the health of Europeans by improving methods for the detection of pathogens in drinking water and water used in food preparation	AQUAVALENS	311846
Ensuring the Integrity of the European food chain	FOODINTEGRITY	613688
Farm Level Indicators for New Topics in Policy Evaluation	FLINT	613800
New ripening room monitoring technology for improving the efficiency and sustainability of cheese ripening processes	SMART-RIPE	613827

Environment (including Climate Change)

Title	Acronym	Reference
Ecological Function and Biodiversity Indicators in European Soils	ECOFINDERS	264465
Marketable sludge derivatives from sustainable processing of wastewater in a highly integrated treatment plant	END-O-SLUDG	265269

Health

Title	Acronym	Reference
PRIMES: Protein interaction machines in oncogenic EGF receptor signalling	PRIMES	278568
Cystic Fibrosis Microbiome-determined Antibiotic Therapy Trial in Exacerbations: Results Stratified.	CFMATTERS	603038

Coordination of Research Activities

Title	Acronym	Reference
Facing sustainability: new relationships between rural areas and agriculture in Europe	RURAGRI	235175
Coordination of European Research on ICT and Robotics in Agriculture and Related Environmental Issues	ICT-AGRI	235460
Agriculture, Food Security, and Climate Change	FACCE CSA	277610
Food security, Agriculture, Climate Change ERA-NET plus	FACCE ERANET+	618105
Coordinated Integrated Pest Management in Europe	C-IPM	618110
Information and Communication Technologies and Robotics for Sustainable Agriculture	ICT-AGRI 2	618123

Capacities Programme

Research infrastructures

Title	Acronym	Reference
Support study for identification of animal facilities in ruminant physiology and breeding accessible to build-up an integrated European infrastructure network	ERIN	227750

Research for the benefit of SMEs

Title	Acronym	Reference
A Novel Transport System for Slaughter Pigs	TRANSUS	262312
Solutions for the mushroom industry to emerging disease threats from Trichoderma and Virus	MushTV	286836
Innovative and sustainable systems combining automatic milking and precision grazing	AUTOGRASSMILK	314879

People Programme

Initial Training Networks

Title	Acronym	Reference
Developing Genetic Tools to Mitigate the Environmental Impact of Dairy Systems	GREENHOUSEMILK	238562
Advanced Technologies for Biogas Efficiency Sustainability and Transport	ATBEST	316838

Reintegration Grants

Title	Acronym	Reference
Nitrogen isotope fractionation as a marker for Nitrogen-use efficiency in dairy cows.	NUEMARKER	239241

Intra-European Fellowships for Career Development

Title	Acronym	Reference
Molecular and Immune Mechanisms Underlying Bovine Lameness	MIMUBLKO	252611
Clarifying the role of Blastocystis in human intestinal disease	BLASTOHIT2012	328673

International Research Staff Exchange Scheme

Title	Acronym	Reference
Global cooperation to develop next generation whole genome SEQuence SELection tools for novel traits	SEQSEL	317697

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