DAFM 2014 Research CALL – Projects funded under the FIRM Programme

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/803	Novel technological approaches for the development of low sugar - highly consumer accepted food and beverage products	UCC, (CIT)	€486,955
Project Coordinator: Prof Elke Arendt			
Project Abstract			
Over 60% of all reported diseases in industrial countries have their origins in poor dietary habits, which include high sugar intake. Sugars fulfil important organoleptic as well as functional properties in a wide range of cereal-derived foods and beverages, but also impact significantly on manufacturing processes in industry. The use of conventional sugar replacers frequently results in poor consumer acceptance due to different mouth-feel and taste perception. In addition, many sugar replacers do not possess sugar's natural ability to provide bulk, reduce water activity and to act as a humectant (maintaining the moisture content of the finished product) and affect gelatinization temperature of starches during baking, thus playing a significant role in structure, volume, and tenderness of a wide variety of food products, such as biscuits, cakes, drinks, sweets and sauces. The TASTY project will address this significant deficit by providing scientific understanding of sweetness perception in complex food and beverages systems and give effective technological solutions using enzymatic and fermentation processes to develop foods and beverages with effective quantifiable reductions in sugar and with improved nutritional qualities. A strong participation of food industry partners in this project will help contribute to the feasibility and economic viability of the strategies developed.			

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/805	Development of Fortified Blended Foods using fermented buttermilk/cereal	UCC, (Teagasc)	€594,123
Project Coordinator: Prof Nora O Brien			
Project Abstract			
In 2013 it is estimated that 842 million people were food insecure, the vast majority in developing countries. The United Nations World Food Program (WFP) assists almost 100 million food insecure people in over 70 countries and purchases in excess of US$ 1 billion of food annually to meet its objectives. The WFP supplies beneficiaries with Food Baskets containing staples and very often complemented with Special Nutritional Products including Fortified Blended Foods (FBFs) targeted at young children to prevent stunting. Current FBFs are primarily composed of dried legume/cereal blends fortified with micronutrients which are then reconstituted by heating with water and consumed as porridge. This proposal is to develop novel FBFs using Irish-sourced ingredients (sweet buttermilk and cereal) and fortified with micronutrients. Our novel products are based on a traditional dried fermented milk/cereal product Kishk which is widely consumed as porridge across Northern Africa, Middle East and Indian sub-continent. We propose to optimise the manufacture of fermented buttermilk/cereal-based FBFs. We will systematically evaluate the products' compositional, nutritional, sensory, shelf-life and microbiological attributes. The products will be superior nutritionally to existing legume/cereal FBFs used by the WFP as our products will have a dairy/cereal base. Cost analysis will also be conducted.			

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/812	Development of consumer optimised low carbohydrate Irish confectionary products	UCC, (Teagasc)	€559,174

Project Coordinator: Dr Maurice O Sullivan

Project Abstract

SWEETLOW optimises traditional Confectionary products (cake, muffin and biscuit-type products) through the reduction and or replacement of sugar with respect to product composition, functionality, consumer sensory quality/shelf life and commercial viability. The minimum concentration of sugar will be identified while maintaining the above attributes in order to determine the very limits of removal. Sensory acceptance testing will be employed to optimise each of these approaches. The project will show clear quantitative goals for the sequential reduction of sugar in Confectionary products. The mean industry sugar levels in Confectionary products will be identified in order to benchmark values. Our approach principally uses sensory-affective optimisation coupled with flash descriptive profiling and multivariate data analysis to reduce the levels of sugar in confectionary products in a clean label fashion as well as reducing these components by utilising traditional and new ingredient and baking technologies that can be used to replace sugar in parallel. Multiple factors are linked to consumer perceptions of sweetness and fat. Sweetness is mainly due to the sugar content but it also depends on the fat and moisture content. Therefore sweetener/fat interactions will be optimised to develop the best products. In summary this project will utilise sensory acceptance testing, flash profiling and flavour volatile analysis, linked via multivariate data analysis, to optimise formulations to produce sugar reduced highly accepted end products. Final products will be assessed via consumer studies

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/813	Disaggregation of food consumption databases to raw agricultural commodity values for estimation of intakes of pesticide residues	UCD, (UCC)	€66,000

Project Coordinator: Dr Anne Nugent

Project Abstract

This proposal seeks to further refine the national food consumption databases of adults and preschool children to underpin public health risk assessments. Specifically, it will disaggregate and convert these national food consumption databases to raw agricultural commodities (RACs) thereby facilitating assessment of intakes of food chemicals such as pesticide residues. Targeting key food groups, foods consumed in the National Adult Nutrition Survey and National Preschool Nutrition Survey will be disaggregated to ingredient level and subsequently conversion factors will be applied using EFSA's European food conversion model(EFSA, 2013). Dietary intakes of target pesticide residues will be estimated. The project will further develop capacity of Irish researchers to participate in JPI and Horizon 2020. The research outcomes will be disseminated to key stakeholders. The data generated in this project will allow Irish policy makers satisfy national and EU requirements for assessing the safety of intakes of food contaminants such as pesticide residues.

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/821	Foods solutions for replenishing disrupted microbiota in toddlers	Teagasc MFRC, (UCC, CUMH)	€597,246

Project Coordinator: Prof Catherine Stanton

Project Abstract

The first two years of life represents the most critical period for dietary interventions to improve child growth/development. This is the period when intestinal microbiota, a vital asset for health and neurodevelopment (Borre et al., 2014) is established. Nutrition influences gut microbiome evolution, with breast feeding in early life the gold standard. Malnutrition is caused not only by nutrient deprivation/imbalance, but also by disrupted gut microbiota, leading to impaired nutrient availability and energy harvesting from the diet (Tilg and Moschen, 2013). Perturbation of optimum microbiota development, arising from preterm birth or antibiotics have likely long-term implications for microbial diversity and consequent health. Little is known about how early gut microbiome is positively manipulated through nutrition. In ongoing studies, we are assessing optimum gut microbiome development in initially breastfed infants from birth to 2 years (INFANTMET) and impact of perturbed microbiota (due to C-section delivery and antibiotic treatment following birth) on health and neurodevelopment to 2 years in the recently FP7 funded MYNEWGUT study. In TODDLERFOOD, we aim to identify food solutions for replenishing a disrupted microbiota of the latter group towards that of INFANTMET infants, so as to enhance microbial diversity in all children, for better long-term health and neurodevelopment.

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/822	Novel nutritional solutions to combat chronic malnutrition in the elderly	UCD, (Teagasc)	€593,034

Project Coordinator: Dr Brendan Egan

Project Abstract

Context: Chronic malnutrition is highly prevalent, but preventable, in the Irish elderly population. Nutrition-related sarcopenia is a consequence of protein-energy malnutrition. A key feature is “anabolic resistance”, wherein muscle protein synthesis (MPS) is reduced due to a blunted anabolic response to insulin and dietary protein. Long chain n-3 polyunsaturated fatty acids (LC n-3 PUFA) supplementation could reduce anabolic resistance to enhance MPS in response to dairy protein and prevent sarcopenia. **Hypothesis:** (1) Combining protein and LC n-3 PUFA within a novel food may prevent sarcopenia; (2) Older consumers have distinct product requirements relating to sensory, textural and nutrition. **Experimental Approach**: A survey will define prevalence of sarcopenia. Consumer focus group approaches will define novel food products criteria for subjects >65y. A human intervention study will establish efficacy of dairy protein with LC n-3 PUFA. Potential novel peptides from potato extract on MPS will be defined *in vitro*.

Impact:

- Define prevalence of chronic malnutrition and sarcopenia.
- Stimulate older consumer product innovation beyond current oral nutritional supplements.
- Demonstrate efficacy of novel nutritional solutions combining protein and LC n-3 PUFA for nutrition-related sarcopenia.
- Liaise with three Irish SMEs to enhance innovative novel food solutions to prevent malnutrition.
- Disseminate novel nutritional science.

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/828	Dietary manipulation of microbiota diversity for controlling immune function	UCC, (Teagasc, UCD, UL)	€1,246,995
Project Coordinator: Prof Paul O Toole			
Project Abstract			
Hypotheses:(1)that gut microbiota diversity can modulate inflammation and susceptibility to enteric infections; (2) that interventions with foo ingredients can modulate inflammation, protect against infection and elicit positive effects on metabolism. **Background:** ELDERMET established a relational database of macronutrient---microbiota---health associations, including inflammatory biomarkers. Studies of younger adults also support a microbiota---inflammation axis, and confirm microbiota diversity modulation by diet. The ELDERMET data identifies exploitable links between food ingredients and microbiota diversity. Additionally several nutrients such as fatty acids modulate immune function and metabolism, but if this is effected via the gut microbiota is unknown. The synergy between nutrition and nutrient driven microbiome diversity represents An opportunity for ingredient development for the food industry. **Experimental approach:** We will use a combination of *in vitro* and pre---clinical models, and human dietary challenge to test the ability of defined food ingredients to modulate microbiota diversity, to promote appropriate innate immune function, and to modulate inflammation---related disorders like type 2 diabetes. APC colleagues in Teagasc Moorepark and UCC will partner researchers in UCD, UL and NUIG to identify food ingredients that promote microbiota diversity, which can be incorporated by the Irish food industry into novel foods that promote health.			

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/845	Application of novel food processing and microanalytical technologies to identify and control spores, in dried food ingredients, and of biofilms in food processing environments-a systems microbiology approach to ensuring quality and safety	UCD, (DCU, Teagasc)	€879,348
Project Coordinator: Dr Amalia Scannell			
Project Abstract			
Dried Food Ingredients (DFI) e.g. flour, herbs & spices, chocolate and milk powders are widely in domestic, culinary and commercial ready-to-eat product contexts globally. This product category is often contaminated with sporeformers, mould and some enteric pathogens. Control of these bacteria in DFI, and biofilms on food processing surfaces is a considerable challenge to the food industry. In this programme, the base-line microbiome of two baked products production sites, including key DFI will be determined. Bacterial phyla, will be described, using dedicated sampling plans including temporal and geographical comparisons. Microbial population sorting using conventional techniques followed by, metagenomic and metatranscriptomic analysis will provide insights into population-level dynamics of this environment. Microbes with anti-biofilm/ anti-sporulation activities will be sought to provide a natural control of biofilms and spores in DFI and baked goods contexts and novel food processing technologies will also be evaluated as new HACCP control steps. The effect of these technologies on gene expression of virulence and quorum sensing factors will be assessed. Comprehensive Risk Analysis will interrogate data streams to evolve improved strategy for microbiological control in the production environment. Research outputs will have a significant impact on the food safety improvements of DFI and consequent brand protection.			

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/866	Process Analytical Technologies for Dairy and Infant Formula powder manufacture	DIT, (UCD)	€549,590

Project Coordinator: Dr PJ Cullen

Project Abstract

With the planned abolition of milk quotas from March 2015, it is a priority that a large proportion of the increased dairy output is linked to added value products such as infant formula. Irish dairy processors will be required to demonstrate that they implement systems to enable control of and confidence in the specifications and properties of the powdered products they produce for the infant formula industry. This is a major challenge considering the high degree of variation and influencers in dairy processes. Through the introduction of a process analytical technology (PAT) approach which facilitates real-time process monitoring capabilities with spectroscopic sensors, the industry can move from inferential monitoring and control towards continuous measurement of core quality parameters.

The overall project objective is to develop and characterise novel PAT technologies for control and optimisation of dairy powder and infant formula manufacturing. Specifically the project will:

- Develop and characterise new PAT tools, namely Laser Induced Breakdown Spectroscopy (LIBS) and Guided Microwave Spectroscopy(GMS), for dairy processing.
- Validate LIBS and GMS PATs for stand-alone use in industrially relevant dairy processing applications.
- Investigate sensor and data fusion opportunities, combining new and existing state-of-the-art sensors and data analytics, for enhanced product characterisation and process control

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/873	Mining marine materials for novel functional ingredients that modulate the immune response for benefit in inflammation and allergy	DCU, (UL)	€557,526

Project Coordinator: Prof Christine Loscher

Project Abstract

Marine protein-derived materials have excellent potential as functional food ingredients. The development of functional “added-value” ingredients is a key priority for the expansion of the Irish Agri-Food sector. NutraMara has already established an extensive research programme mining marine species for ingredients with health benefits. This project will now build on and complement this programme by mining marine species for novel ingredients that can modulate the immune response in inflammation and allergy. This is in response to an identified need amongst Irish ingredient companies for such ingredients for their global customers for functional foods for infants, the elderly and sports participants. The project will involve existing NutraMara Principal Investigators at UL who will extract and hydrolyse the marine materials along with an Immunologist at DCU who is an expert in Immunomodulation and has extensive experience working with food companies. The key objective of the proposed programme is to identify new protein-derived ingredients that can modulate specific immune responses associated with a reduction of either inflammatory or allergic disease. This will be achieved by determining the effects of the marine extracts on key immune cells that mediate these diseases/conditions and assessing them in *in vivo* models of inflammatory and allergic disease.

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/881	Assuring the safety of mushrooms by the introduction of novel processes to reduce Listeria monocytogenes biofilms and environmental contamination in mushroom production facilities	Teagasc, (CIT)	€525,625

Project Coordinator: Dr Kaye Burgess

Project Abstract

Mushrooms are Ireland's most valuable horticultural crop, produced in 75 growing facilities. The sector is driven by the export market to the UK. The recent detection of *Listeria monocytogenes*, a potentially lethal foodborne pathogen, in Irish mushrooms and in mushroom production facilities is a cause of extreme concern to the industry. The ubiquitous nature of *Listeria* in the environment, coupled with its ability to form biofilm and persist in processing environments, is of particular concern. *Safemush* will address these concerns by developing new technologies, which can be employed by the mushroom industry, to prevent contamination of the production environment with *Listeria* by reducing/controlling biofilm formation, thereby enhancing the safety assurance of their crops. Selected bacteriophage, pathogen controlling bacteria and bacteriocins will be examined for suitability as biocontrol agents within the mushroom production environment, which can be used in synergy with current disinfection and cleaning methods. The application of such treatments will be guided by an in-depth analysis of the mushroom production chain to determine where the greatest likelihood of contamination occurs. The efficacy of current and novel treatments will be tested on biofilm forming cultures and their utility and impact demonstrated in pilot-scale growing conditions.

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/F/883	Development of Spore Analysis Critical Control Point (SACCP) charts for application in dairy manufacturing processes	Teagasc, (Tyndall Institute - UCC)	€624,730

Project Coordinator: Dr Phil Kelly

Project Abstract

The background microbiological load of raw milk and processed dairy ingredients supplies presents ongoing challenges for the dairy industry and nutritional product formulators in Ireland and globally, linked particularly to specifications on acceptable limits for high heat resistant spore forming microbes of *Bacillus* and *Clostridium* spp. With entry into the milk supply chain associated in the first instance with milk production practices and uncertainty as to their subsequent fate during milk processing, there is concern at the lack of in-process containment measures to limit spore numbers since pasteurisation processes are effective only when the contaminating organisms are present in the vegetative state. Recent events have highlighted the significant reputational damage that arose during a sporeformer-based contamination incident which was further aggravated by mis-identification of the isolated microorganism. In any case, allowable levels of contamination are continually decreasing in-line with end user specifications and a global trend towards higher food safety, particularly in high risk categories such as infant and medical nutrition, which predominantly utilise dairy ingredients within their product. Furthermore, breakdowns in control of food safety and specification management within the supply chain may lead to high levels of out of spec finished and semi-finished ingredients resulting in either downgrade or re-work - scenarios which greatly increase the total cost of goods and services (COGS) for the processor. Unfortunately, very little scientific research is available to provide the dairy industry with a platform of inactivation technologies for heat resistant spores, particularly of *Bacillus* and *Clostridium* spp., while having due regard to the product's capacity and stability to tolerate the required technological intervention.

The SACCP project proposes to (a) identify the key problematic spore-forming bacteria in Irish powdered dairy ingredients, (b) assess existing detection systems, and (c) evaluate novel thermal and non-thermal processes as to their efficacy to reduce spore numbers within dairy manufacturing processes. Spore Analysis Critical Control Point (SACCP) is intended to go beyond widely established HACCP (Hazard Analysis Critical Control Point) practices which rely on use of pasteurisation as a Critical Control Point (CCP). SACCP, on the otherhand, will generate process flow diagrams for spore reduction/eradication across the complete dairy portfolio, including liquid milk/whey, dairy isolates/concentrates and sports/medical/infant nutrition by considering and assessing the limitations of thermal and other processes while having due regard to the stability and processability of dairy streams exposed to higher thermal loadings. Additional assessment criteria will include an appraisal of the robustness and feasibility of technology to perform in a commercial installation. This step will be facilitated by breakthrough efforts on the part of Tyndall National Institute with the development of a rapid analytical biosensor for spore detection – prototypes of which will be tested in conjunction with pilot plant study tasks taking place during the course of the project.

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/SF/820	Reducing the impact of pathogens and disease in the Irish oyster industry to support the sustainability and growth of the sector	UCC, (MI, NUIG)	€592,141
Coordinator: Dr Sarah Culloty			
Project Abstract			
Food Harvest 2020 forecasts a 78% increase in aquaculture volume production in Ireland by 2020. The shellfish industry is an important part of this sector with the Pacific oyster *Crassostrea gigas* being the main oyster species produced. The aims of this study are to ameliorate the impact of pathogens and disease in the Irish oyster industry that are threatening our ability to reach these targets. Since 2008, mortalities occurring in Ireland have been associated with a newly emerged herpesvirus variant. Since 2012, pathogenic strains of the bacterium *Vibrio aesturianus* have also been identified in Irish oysters having already caused mortalities in France. In this study, the role of these pathogens in mortality events will be investigated through field surveys at several culture sites. Any pathogens identified will be characterized using molecular based studies and pathogenicity investigated using diagnostic techniques and laboratory trials. The role of environment and other hosts at culture sites will be determined to help inform management. Modified husbandry methods to help reduce mortalities and other control methods such as the use of antiviral compounds will be assessed. Policy guidelines will be produced to help reduce the impact of losses in this industry, ultimately helping to grow the sector.			

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/SF/852	Developing a risk assessment framework for norovirus in Irish oyster production areas	UCD, (MI)	€360,843
Coordinator: Prof Francis Butler			
Project Abstract			
Gastroenteritis resulting from consumption of sewage contaminated oysters containing norovirus (NoV) is a significant public health problem. Official food controls in this area are inadequate to prevent illness and no standards exist for NoV in oysters. Largely this is because of a lack of data on the extent of illness associated with oysters containing NoV. This project will develop a risk assessment model incorporating a product pathway analysis to estimate the risk of Norovirus (NoV) related illness following consumption of oysters from specific production areas. The project will generate new NoV prevalence and distribution data for oysters using a recently developed standardised molecular procedure for detecting NoV in oysters. From this data an exposure model will be developed. Existing published data on the dose response for NoV and host susceptibility factors will be combined with the exposure model to develop the risk assessment model. The output from the project will allow risk managers introduce control measures in this area based on acceptable limits for NoV in oysters derived from evidence based information. In addition the model will allow producers to assess the impact of potential treatment options to target risk management intervention in a cost effective manner.			

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/SF/847	The comparative public and animal health risks associated with spreading Anaerobic Digestate, animal manure and slurry on land: Science, Policy and Practice	Teagasc, (UCD, NUIG)	€815,050

Project Coordinator: Dr Declan J Bolton

Project Abstract

Anaerobic digestion of animal by-products (ABP), such as manure and slurry, produces digestate that ends up in the environment. A thorough investigation of anaerobic digestion processes is required to assess the risks to human and/or animal health associated with biological components in the original ABP and their AD products. In Ireland most AD biogas fermenters use manure and slurry as one of the primary raw materials but these may be supplemented with additional organic components such as food wastes to achieve the C:N ratio that is optimal for methane production. Manure, slurry and to a lesser extent food wastes may contain a range of hazards including animal pathogens and zoonotic agents (bacterial, viral and parasitic) which must be effectively inactivated during the process. Pathogen survival will be effected by initial concentration and AD conditions. Non-spore-forming bacteria, most viruses and some parasites can be inactivated by temperatures in the range of 50 to 100°C (Fayer 1994) but thermostable viruses and spore-forming bacteria require temperatures above 70 and 100°C, respectively. Many of these organisms are also sensitive to low and high pH, however some parasitic species, such as *ascaris* eggs, are tolerant to extreme pH values. On the basis of the temperatures and pH reached during processing, it would appear that the conditions during AD are not sufficient to ensure the destruction of bacterial, viral and parasitic pathogens. Biogas reactors in Ireland operate within different temperature ranges; mesophilic (between 35 and 40°C) and thermophilic (between 45 to 55°C) and pH values between 7 and 8.5 generally prevail (the pH should not decrease below pH 6.8 otherwise the metabolic activity of methanogenic bacteria is adversely affected and biogas production severely reduced). If these conditions of temperature and pH under anaerobic conditions are not sufficient to ensure pathogen destruction then the raw materials or digestate should be pasteurised, but again there is insufficient data to validate this pre/post AD thermal treatment. This project will investigate the survival of important human and animal bacterial, viral and parasitic pathogens during AD (with and without pre and/or post-AD pasteurisation), and examine the comparative risks to public and animal health associated with spreading digestate versus manure and/or slurry on land with an overall aim of providing the data/knowledge required to develop policy and practice that minimises the risks associated with anaerobic digestion.

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/SF/855	Agri-Food Graduate Development Programme	UCC, (UCD, Teagasc)	€874,354
Coordinator: Prof Alan Kelly			
Project Abstract			
This proposal aims to establish a new Agri-Food Graduate Development Programme (AFGDP) for 2014-2018. The proposed programme builds on both the Food Graduate Development Programme (FGDP) established in 2007, and the Agri-Food Graduate Development Programme (AFGDP) that commenced in 2012. The overall aim of the proposed programme is to provide skills training to postgraduate students in the Agri-Food (including forestry and marine) sector in universities and research institutions in Ireland. Through the delivery of accredited modules on 40 occasions, participants will receive training in topics that are relevant to those pursuing a leadership career in Agri-Food. There is a focus on enhancing industrial knowledge, business and personnel management, leadership, communication as well as advanced research and development skills. The programme will foster personnel with skills capable of leading the development of Ireland's knowledge-based bio-economy. The new AFGDP will also explore opportunities to liaise with on-going initiatives to provide cost-effective delivery of Continuing Professional Development. The proposed programme has strong links with industry, to up skill graduates for employment and the rapid adaptation to challenging careers. Ultimately, the Programme will contribute to improved human capital within the Agri-Food sector, contributing to the competitiveness of this key sector of the Irish economy.			

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14/SF/860	Arsenic in marine macroalgae and Implications for commercial Uses	MI, (NUIG)	€277.437
Coordinator: Dr Evin McGovern			
Project Abstract			
There is major potential for expanding the exploitation of our natural seaweed resources to provide products and materials for the food sector, for fertiliser and feed, in biotechnology and for many other applications. Arsenic can accumulate to high levels in seaweeds. It is typically present as organoarsenicals whose toxicity, though not well characterised is much less than for inorganic arsenic. However, non-compliance of algal-based feed products with EC regulatory limits for total arsenic presents a problem for the industry. Moreover, recent evidence shows high levels of toxic arsenic can occur in certain parts of kelps. This project will establish a reliable and simple analytical methodology for determination of inorganic arsenic in seaweed. Using this method, we will determine the variability of total and inorganic arsenic in various commercially relevant species and investigate intra-plant variation. We will also investigate, for example using transplant studies, the environmental factors that influence total and inorganic arsenic concentrations. Finally, we will investigate the effect of processing and storage on arsenic speciation in brown seaweeds. This information will support industry in developing strategies to minimise arsenic concentrations in products and assist policy makers in risk management and developing practical regulation for consumer protection.			

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
14SF872	Enhancing production and sustainability in Irish aquaculture	NUIG, (AIT)	€599,577
Coordinator: Dr Eoghan Clifford			
Project Abstract			
MOREFISH is a timely aquaculture project that proposes to develop and test innovative technologies and novel production processes to significantly improve production output, operational efficiencies and management at inland aquaculture sites in Ireland. These innovations will have key impacts including (i) enhanced production efficiency and sustainability, (ii) reduced environmental emissions and impacts of production and (iii) improved fish health and reduced finfish diseases/mortalities in rearing systems due to improved operating conditions. Achieving these goals is also necessary to reconcile the contrasting demands of the growing National aquaculture industry with meeting the goals of the Water Framework Directive. The multidisciplinary project comprises engineering and scientific expertise, industry stakeholders and policy-makers and commercial operators to respond directly to critical technical and policy gaps identified by stakeholders and this DAFM call. Specifically, MOREFISH targets innovative approaches that will increase fish biomass output, productivity and stocking densities, mitigate contamination and cross-infection, and reduce production costs and waste emissions. The project proposes three pilot sites (in partnership with industry) to test and demonstrate key innovations. These have been strategically chosen to include key production segments and facilities such as trout farming, smolt production for the marine salmon farming industry and Arctic char production.			

DAFM Reference	Project Title	Lead(Collaborating)Institution	Award
13/SN/401	Sensory Network Ireland	Teagasc, (AFBI,UCC, UCD, DIT, CAFRE, St Angela Food Technology Centre, GMIT, NICHE, LIT)	€675,022

Coordinator: Dr Eimear Gallagher

Project Abstract

Recognising the importance of sensory science in the food industry has evolved from the increasing need for a scientifically sound and systematic approach to the sensory evaluation of foods. In the past number of years, the field has made substantial progress in developing new methods and approaches, and in advancing our understanding of consumer responses to foods. In food companies, sensory food science has become of considerable value to both tactical and strategic research goals. Currently throughout the island of Ireland, all aspects of sensory science and sensory services to industry are being addressed in research and 3rd-level organizations, albeit in a fragmented and non-uniform way. With the development of SensoryNetIreland, the sensory facilities of ten national institutions will be integrated and promoted as an advanced service to the food industry which is underpinned by a comprehensive research programme. This will be accomplished initially through collaborative networking activities to enhance the knowledge base relating to our current collective critical mass in the field. The proposed network promises enormous potential, as it combines all existing sensory services, expertise and capabilities in the country, which will work as a sustainable unit to address documented needs/gaps by the food industry in relation to sensory science. It will also ensure that good practice and the highest level of service will be assured to industry. The network will actively encourage and facilitate collaboration between industry and research groups. SensoryNetIreland will form an integral part of food and beverage industry to support new product development, product matching, flavour development and enhancing understanding of consumer behaviour within specific market segments. As well as a first class service to industry, an ultimate goal of the network is to aspire to the highest level of scientific excellence in research in sensory food science. The network is dedicated to developing and improving research into sensory and consumer testing methodologies, with the aim of launching Ireland on the international map in this field.

The objectives of the proposed research programme are;

- To strengthen existing sensory capability within the network through research into specific sensory sciences and associated sciences; flavour chemistry and statistical sensometric expertise involving foods of particular relevance to the Irish economy.
- UCD will lead a task investigating emerging sensory methodologies designed to achieve validated research using rapid cost effect techniques in association with Teagasc. The associated student will be registered in UCD.
- Teagasc will lead a task with a student registered in UCC investigate the utilization of a chemometrics/sensometrics approach to relate sensory and chemical data in order to create a flavour map of a food that can be related to consumer perception.
- AFBI will lead task in association with UCC and Teagasc, investigating consumer preference in beef using cross cultural studies in the UK and Ireland. The associated student will be registered in UCC.