



THE DEPARTMENT OF
AGRICULTURE & FOOD
AN ROINN TALMHAÍOCHTA AGUS BIA



Marine Institute
Foras na Mara



MARINE FUNCTIONAL FOODS RESEARCH INITIATIVE

TERMS OF REFERENCE



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National Development Plan 2007 - 2013

BACKGROUND

The Marine Functional Food Research Initiative (MFFRI) is a joint initiative established by the Marine Institute and the Department of Agriculture and Food (DAF). It is supported by funds provided under the Strategy for Science, Technology and Innovation 2006-2013 (SSTI)¹ and the Food Institutional Research Measure (FIRM), to establish a Marine Functional Foods Research Programme.

Since 1996, the Department of Agriculture and Food through the Non-commissioned Food Research Programme (NCFRP) and its successor, the Food Institutional Research Measure (FIRM), has funded major scientific food research in Irish research institutions. These investments have led to the generation of highly skilled scientists producing high quality scientific results and, in some cases, the production of new and innovative food products and technologies. Similarly, the Marine Institute has funded a large portion of Ireland's marine science research activities. During the period of the last National Development Plan (2000-2006), the Institute provided funds for institutional based strategic research; applied-industry research; research infrastructure and for travel/network support. A range of Post-Doctoral Fellowships and PhD Scholarships also enabled young researchers to participate in Irish based marine related research activity.

The SSTI and *AgriVision 2015 Action Plan*² enforce the objectives of the FIRM and describe key actions for the future development of the Agriculture and Food sector. From the marine perspective, *Sea Change - A Marine Knowledge, Research and Innovation Strategy for Ireland 2007-2013*³ presents a strategy that aims to drive the development of the marine sector as a dynamic element of our knowledge economy. *Sea Change* and the report of the Seafood Industry Strategy Review Group, *Steering a New Course - a Strategy for a Restructured, Sustainable and Profitable Irish Seafood Industry 2007-2013*⁴, both call for a research programme in Marine Functional Foods. The strategic positioning of Ireland's marine foods sector to become more research intensive supports the enhancement and strengthening of Ireland's knowledge economy and is also in line with the EU Lisbon Agenda.

The Marine Institute and the Department of Agriculture and Food (DAF) have agreed to co-fund institutional based research in support of the development of Ireland's food and seafood sectors, and to expand the base of Irish functional food research to include marine origin materials. This initiative is designed to develop capability and create new additional capacity in marine functional foods and ingredients research. The initiative will lead to a greater utilisation of Ireland's marine resource by encouraging participation by Irish marine and food scientists in food-oriented collaborative research.

DESCRIPTION OF THE RESEARCH INITIATIVE

Introduction

This initiative will provide support to a consortium of research institutions to develop collaborative research, integrating experienced researchers from the areas of food, health, marine and ecological sciences under new scientific leadership. The successful consortium will be required to deliver an integrated research programme that builds on its' existing skills and expertise and is aligned to one or more of the areas of research identified in the recent Marine Institute hosted workshop on functional foods and ingredients⁵. The focus of the research programme will be to deliver high-quality internationally ranked research outputs of relevance to Ireland's food and seafood sectors.

The MFFRI will contribute €5.2 million over the period 2007 to 2013 to the successful consortium to fund new research in relevant areas relating to marine functional foods and ingredients.

¹ <http://www.entemp.ie/science/technology/sciencestrategy.htm>

² <http://www.agriculture.gov.ie/publicat/publications2006/AgriVision2015.pdf>

³ <http://www.marine.ie/home/SeaChange.htm>

⁴ <http://www.dcmnr.gov.ie/NR/rdonlyres/5573CE12-362F-4CE7-B8EC-830B50AFE378/0/SteeringaNewCourse.pdf>

⁵ <http://www.marine.ie/home/community/events/pastevents/MarineFunctionalFoodsWorkshop.htm>

In line with national strategic objectives to create a sustainable research capability in areas of functional seafood and marine origin functional ingredients, the funding partners are committed to building capacity around experienced research leaders. In doing so, the aim is to establish the nucleus of a research activity with potential to contribute to building new research skills and delivering outstanding research results. It is anticipated that the research teams established within the successful consortium will be in a position to support the future needs of the Irish food and seafood industries; have the capability to participate in international collaborative research programmes (e.g. FP7); and secure significant research funds to enable an expansion of their research programmes.

Overall Objectives

The objectives of the Marine Functional Food Research Initiative are to:

1. Create a strong, interdisciplinary research capability, capable of exploiting marine biodiversity as a source of materials for use in functional foods;
2. Develop capabilities to process marine-based materials for use by the functional ingredients sector;
3. Support the creation of new research capacity in areas that underpin research in marine functional ingredients and foods; and
4. Establish new research capabilities in marine functional foods—linking indigenous and multi-national food and pharmaceutical industries with researchers at state and higher education research institutions.

These objectives are to be met by the creation of a research consortium comprising research performers from research institutions on the island of Ireland.

Research Areas

This initiative is designed to support research related to marine origin bioactive compounds and their use in new value-added seafood products and as ingredients in functional food. The research programme should be designed to provide scientific knowledge that can be used by firms in Ireland's food and marine sectors. To this end, it is essential that there exists an alignment of research activity with future innovation opportunities. Research proposed under this initiative should be intimately aligned with innovation processes and reflect a closeness on the part of the collaborators to the food, seafood and food ingredients sectors. The consortium should establish an appropriate framework within which to manage intellectual property.

Ireland's marine environment is a fragile ecosystem. Hence, any research that seeks to exploit or harvest marine materials as a source of bioactive compounds—whether fish, shellfish, marine algae, or other marine organisms—should do so from a perspective that recognises the necessity for marine materials to be harvested sustainably.

The recent marine functional foods workshop hosted by the Marine Institute⁶ identified the priority research areas for marine functional ingredients as peptides, amino acids, enzymes, alkaloids, polymers, polyunsaturated fatty acids; protein hydrolysates and materials with antioxidant, probiotic or prebiotic properties.

The research programme should explore and deliver new knowledge relating to:

1. The identification, extraction and validation of bioactive compounds from one or more of the above sources of material and the verification of the physiological effects of these compounds; and
2. Developing the required scientific knowledge, capabilities and processes necessary to assess and evaluate the potential of marine origin bioactive compounds for use as components in functional foods and as food ingredients.

⁶ <http://www.marine.ie/home/community/events/pastevents/MarineFunctionalFoodsWorkshop.htm>

Each of the research teams within the successful consortium will be required to engage in one of the above research activities and participate in the delivery of an integrated research programme designed to fill knowledge gaps in marine functional foods and ingredients research.

Structure of the Consortium

The Marine Institute, in partnership with the Department of Agriculture and Food, through the Marine Functional Foods Research Initiative, invite applications from a consortium of research institutions (from within the island of Ireland) to develop high-calibre, multidisciplinary, collaborative research teams to engage in areas of marine functional food research as outlined above.

Consortia should agree a single institution to lead an integrated scientific programme and be responsible for outputs from the work programme developed by two research teams to be established within the consortium.

Using funds available from this initiative and, if necessary, drawing from other sources, the consortium should commit to:

- 1) Recruit two senior researchers at professorial level; and
- 2) Establish **two research teams** under their leadership.

The consortium should agree an overall research director, appointed from within the team leaders, who will have responsibility for the delivery of the integrated research programme.

The research team leaders will be internationally ranked scientists with an outstanding research track-record in an area related to functional foods, health or marine sciences, with an emphasis on the use of materials from the marine in food products. They should have sufficient experience to lead a national research programme of this magnitude. They will provide a focal point around which to build new research capabilities and capacity.

The teams should integrate scientific expertise from the food–health area with expertise from the marine science areas. The programme of work should seek to fill scientific gaps and complement existing knowledge in a key area of marine origin functional food products and ingredients research.

The consortium should position the teams such that they are able to draw from existing areas of food, health and marine research expertise; and in doing so benefit from food and marine industry insights and knowledge.

Research Programme

The proposed research programme should be related to the strategic research priorities of the institutions forming the consortium and reflect a deep understanding of the research needs of Ireland's food and marine sectors. The programme of research and associated costs will be finalised following discussions between the successful consortium, the Marine Institute and the Department of Agriculture and Food.

The scientific programme will last a minimum of seven years, subject to review by the Marine Institute and Department of Agriculture and Food after five years.

Research Team Objectives

Each of the research teams set up by the consortium should fulfil the following objectives:

1. To develop a sustainable, high-calibre, integrated, multidisciplinary, collaborative research team under the leadership of an internationally ranked scientist;
2. To develop a scientific programme for new and innovative research relating to marine functional foods and ingredients;
3. To ensure the scientific programme fills gaps in existing knowledge in a key area(s) of marine foods and functional ingredients;
4. Be responsive to the future needs of Ireland's food and marine foods sectors; and
5. Generate sufficient research capacity to enable it to participate in international collaborative research programmes.

Deliverables

Fundamental to this initiative is the delivery of outcomes that are relevant to Ireland's marine and food sectors and are accessible to firms in these sectors. The initial focus of the research must therefore be upon the identification of research opportunities and the definition of a strategy by which these opportunities can be delivered.

The successful research consortium is required to deliver:

1. A report, delivered 18 months into the work programme, on the status of international research as it relates to marine functional foods and ingredients and highlighting knowledge gaps that can be filled by new Irish research performed by the consortium.
2. An agreed programme of fundamental research that develops a lasting competency on marine functional foods and ingredients, drawing on the above review.
3. New knowledge on which to base the development of marine functional foods and ingredients from species that can be harvested sustainably.
4. Specific research actions and outcomes from a defined and planned work programme.
5. The creation of additional research positions within dedicated teams.
6. Relevant research training at post-graduate level in order to stimulate the creation of additional research capacity.
7. Research teams able to contribute to and draw from the *Sea Change* programme.
8. The publication of research outputs in high-impact international journals with due consideration to maintaining intellectual property rights.
9. Relevant and appropriate dissemination of research outputs through, e.g., workshops, conferences and publications.

Research Management

This initiative does not directly support the commercialisation of research or fund industry involvement in the research. However, submissions made to this initiative and the final agreed work programmes must demonstrate the consortium is aware of the industrial relevance of the proposed research and the need, therefore, to ensure research outcomes are available to industry. To this end, consortia are encouraged to seek the involvement of industry in support of the research programme.

Intellectual property

Although it is accepted that not all research outputs will lead to the development of intellectual property, IP should be proactively managed. In this regard, the research consortium will be required to take steps to protect and make available IP generated during the research programme and to ensure research activities do not infringe the IP rights of others.

Innovation and commercialisation

The research outcomes from work supported by this initiative should lead to new opportunities that can be built upon by Ireland's marine and food sectors. An awareness of national and international legislation as it relates to claims concerning bioactive components will therefore be necessary. Responding to this challenge requires the consortium to describe its strategy for addressing and supporting innovation and commercialisation processes. There is a requirement for the consortium to provide insights to the existence of a systematic approach concerning:

- The processes leading to the discovery and application of new bioactive compounds;
- The development of scientific and clinical capabilities required to assess and validate the biological activity of compounds; and
- The identification and use of 'mining' and other process technologies.