

Proposal Outline

Topic	Sustainable, accessible and safe food, feed and bio products from the ocean
Research Theme(s)	1) Bioresources – Aquaculture & Biomass Production, and 2) Bioresources – Processing for Food & Other Use
Background and Rationale	The United Nations predicts that the global population will grow to 9.8 billion by 2050, an increase of 2.5 billion people compared to 2015. In addition, the UN Food and Agriculture Organisation has projected that food demand is likely to increase by 60% by 2050. Nutritional challenges and the expectations of citizens in an increasingly prosperous (and populous) world will also intensify global demand for food and biomass. The COVID-19 pandemic has highlighted the need for a robust, safe and resilient food system that is resistant to shocks in production and supply chains, and is capable of providing citizens access to a sufficient supply of affordable food. Sustainable food systems can also bring environmental, health and social benefits and are central to achieving the UN Sustainable Development Goals. The blue bioeconomy is a fast developing sector in Europe and refers to utilisation and conversion of living aquatic resources (e.g. algae, finfish, invertebrates, microbes) into products and services (e.g. food, feed, bio products). Its development is uneven throughout member states and advancing the sector could be boosted through focused research and innovation, improving regulatory and governance frameworks and supporting market developments. The EU Farm to Fork Strategy targets an accelerated shift to sustainable fish and seafood production. Seafood production, like many sectors, needs to transition to a more sustainable, low carbon base if we are to achieve the ambitious targets the EU have set on climate change. This transition must occur in a way that ensures that the sector remains both profitable and resilient, and will need alignment across multiple disciplines including technology & innovation, finance, policy, planning, trade, marketing, food safety and consumer behaviour. At a national level, both the DAFM Statement of Strategy (2021-2024) and the Programme for Government (Our Shared Future) incorporate sustainable development of the fisheries and aquaculture sectors. A future for these sectors will include a transition to a low carbon base, understanding environmental impact and ecosystem responses, protecting biodiversity, diversification, monitoring, regulated by robust policies and legislation. In addition, the adoption of innovative technologies, coupled with circular and nature-based solutions will be among the key drivers of this transition.

	Given the importance of Ireland's seafood sector (GDP of €1.09bn in 2020), research and innovation that underpins the action plan for transitioning this sector to a green economy, as set out under the EU Green Deal, is vital.
Scope of Research (Scientific/ Technical Challenge)	This research will support national efforts to transition the blue bioeconomy into a sustainable, low carbon, resilient, transparent/safe and profitable sector. This will be key to achieving the targets set out in the EU Green Deal and Farm to Fork Strategy, as well as contributing to reliable and safe food production systems and to rural development and employment. Applicants should seek to address one or both of the research themes specified above (Aquaculture & Biomass Production, Processing for Food or Other Use) and are encouraged to develop synergies with existing programmes of work in this area. This could include, but is not limited to, research in the areas of circularity (e.g. valorisation of waste), innovative and sustainable seafood production systems (e.g. advancement of low- and multi-trophic aquaculture, low impact fisheries, use of enabling technologies like ICT, biotechnology etc.), life cycle assessment, food security and traceability, optimising existing value chains, alternative sustainable sources of protein for food and feed, socio-economics, and diversification (e.g. products, species). The fellow would ideally have a primary degree and PhD in aquaculture, fisheries, marine biology or other blue bioeconomy-related discipline.
Expected Impact	This fellowship will help to build national expertise in this research area. The research findings will be disseminated as widely as possible to key stakeholders through, for example, peer-reviewed papers, conference presentations, policy briefs, articles, social media, industry workshops. The fellow will be encouraged to facilitate collaborations with commercial entities engaged in leveraging outputs from this research into commercial products, and leveraging research outputs into additional grant funding (e.g. under Horizon Europe).
Specific Collaboration	Marine Environment & Food Safety Services, Marine Institute Department of Agriculture, Food and the Marine, Agriculture Sea-Fisheries Protection Authority BIM (Bord Iascaigh Mhara)
Location of Fellow	Higher Education Institute or Public Research Body (Republic of Ireland or Northern Ireland)

Duration and Funding Available	4 years €100,000 per annum (i.e. total €400,000 maximum for duration of four years)
References	DAFM Statement of Strategy (2021-2024) Programme for Government: Our Shared Future (2020) Blue Bioeconomy Forum: Roadmap for the blue bioeconomy (2019) European Green Deal Costello, C., Cao, L., Gelcich, S. et al. The future of food from the sea. <i>Nature</i> 588, 95–100 (2020). https://doi.org/10.1038/s41586-020-2616-y https://www.unep.org/news-and-stories/story/how-feed-10-billion-people https://www.wri.org/insights/how-sustainably-feed-10-billion-people-2050-21-charts https://www.nature.org/en-us/what-we-do/our-insights/perspectives/how-to-feed-the-planet-while-protecting-the-ocean/ Sara G. Lewis, Mariah Boyle, The Expanding Role of Traceability in Seafood: Tools and Key Initiatives (2017) <i>Journal of Food Science</i> https://doi.org/10.1111/1750-3841.13743 Smith, D., Buddie, A.G., Goss, R.J.M. <i>et al.</i> Discovery pipelines for marine resources: an ocean of opportunity for biotechnology? <i>World J Microbiol Biotechnol</i> 35, 107 (2019). https://doi.org/10.1007/s11274-019-2685-y