



Biotechnology and
Biological Sciences
Research Council

The Diet and Health Open Innovation
Research Club programme

Accelerating impact in diet and health





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“ The six hubs funded through the Diet and Health Open Innovation Research Club form a powerful national platform, driving innovation through academic-industry collaboration. ”

Dr Lee Beniston FRSB, Associate Director for Industry Partnerships
and Collaborative Research and Development, BBSRC

Foreword

The Diet and Health Open Innovation Research Club programme represents a landmark national investment in an area where the UK is uniquely positioned to lead globally: transforming dietary health while building a more sustainable, resilient food system. Through its network of dynamic hubs and aligned funding, this programme has created a collaborative environment that bridges the gap between discovery science and commercial application, ensuring that cutting-edge research translates into real-world impact.

Poor diet and conditions related to this, reduce quality of life, limit participation in everyday activities, affect workforce productivity, and increase the burden on the NHS and Social Care. Addressing these challenges through innovation is not only a health imperative but an economic necessity.

The projects showcased here exemplify the transformative power of partnership. From pioneering the world's first omega-3 enriched tomatoes, to practical innovations, such as, the inulin-infused tea, both demonstrate how targeted R&D can deliver healthier diets and unlock new market opportunities. Other initiatives, such as designing functional foods to support people living with Parkinson's disease, to the UK's first independent prebiotic guide, highlight the breadth of impact this programme is realising. Equally, projects developing processes that could accelerate commercial applications for sustainable UK-grown botanicals and are actioning innovative changes in animal feed to enhance the nutritional profile of eggs, whilst also reducing environmental impacts, underscore our commitment to sustainability and resilience in the food system.

This success has been made possible through close collaboration across UK Research and Innovation and partnership with the British Nutrition Foundation and UK Government departments. The programme's strong alignment with Defra's Good Food Cycle reinforces its relevance to national priorities and its contribution to government ambitions for a healthier population and a more resilient food system. Crucially, the programme is also delivering against UKRI's strategic objectives to drive innovation-led growth, strengthen supply chains, and support SMEs to scale, remain competitive, and grow within the UK.

"The six hubs funded through the Diet and Health Open Innovation Research Club form a powerful national platform, driving innovation through academic-industry collaboration. The Hubs are accelerating the translation of world-class science into real-world solutions for healthier, more sustainable diets, whilst providing opportunities for SMEs to grow and scale, which in turn is strengthening the UK's food innovation ecosystem. The incredible value of this growing community positions it to play an increasingly influential role in driving future innovation and delivering against the UK's strategic priorities in diet, health, and sustainable food systems."

Dr Lee Beniston FRSB, Associate Director for Industry Partnerships and Collaborative Research and Development, BBSRC



The need for diet and health research by working towards solutions



Sara Stanner:
Science Director,
British Nutrition Foundation

What people eat and drink has a profound impact on their health. Unhealthy diets are a major contributor to the burden of disease globally, including in the UK where it is estimated that poor diets cause more than 75,000 premature deaths annually. Diet-related diseases disproportionately affect people from lower socioeconomic backgrounds, who are more likely both to develop and die from conditions linked to poor diet. One of the most concerning consequences of poor diets is the high prevalence of obesity. Obesity significantly increases the risk of type 2 diabetes, cardiovascular disease, certain cancers, liver disease and depression. Concerns about poor diet extend far beyond obesity alone. The UK faces what is often described as the 'triple burden' of malnutrition: overweight and obesity, undernutrition, and micronutrient inadequacy and overall, UK diets fall short of recommendations for a healthy, balanced diet. With fewer than 1% of the UK population meeting all of the recommendations set out in the Eatwell Guide. These patterns underscore the need for effective interventions to support healthier eating habits and address the impact of diet on public health.



Ayela Spiro:
Nutrition Science Manager,
British Nutrition Foundation

Given the complexity of the food system – with its many actors spanning agriculture, processing, manufacturing, catering, retail and consumption – meaningful progress requires collaboration. Innovation, new product development and evidence-based interventions all play essential roles in reshaping the food system. The UK's strong track record in nutrition science, rich dietary data resources and globally recognised nutrition policy expertise positions it well to contribute to improve diet and health. However, for research to deliver its full impact, it must be translatable into real-world public health benefits. This depends on strong partnerships between funders, researchers, government and industry. Cross-sector collaboration can unlock greater investment in innovation and accelerate the development of practical solutions.

The British Nutrition Foundation exists to promote health and wellbeing and prevent diet-related ill health through evidence-based nutrition science. The Foundation provides a bridge between nutrition science, government, industry, education and people, and a conduit to a healthier, more sustainable food environment for all. We are proud of our longstanding reputation for fostering partnerships, uniting stakeholders from diverse sectors who share a common interest in food, nutrition and health.

We are delighted to serve as coordinators of the six BBSRC OIRC hubs. In this role, we help increase awareness, reach and impact, facilitating conversations between the research community, industry, policymakers and wider society and bringing different perspectives and expertise into the programme. With our strong track record of engagement, dissemination and partnership working, we are well placed to build new relationships across disciplines and strengthen research capacity. We seek to proactively catalyse and convene knowledge-exchange, collaboration and wider connectivity to support the OIRC hubs to thrive both individually and as a single OIRC community. This gives us an exciting opportunity to energise the community and promote research that leads to real-world improvements in diet and health.

In the words of the OIRC Hub Leads

“ i-NutriLife has been successful in attracting exciting applications for innovative research across the life course. So far, we have been able to fund 19 projects. A number of these have been led by early career researchers and involve SMEs as the industry partner. From the feedback received so far, our awards are highly valued by the research community and are proving instrumental in establishing new and effective academia-industry partnerships and in fostering the careers of the next generation of independent researchers. ”

Professor Philip Calder, i-NutriLife Hub Lead, University of Southampton

“ I’ve been genuinely inspired by the breadth and quality of the research we’ve been able to support. Early on, it was clear we were meeting a genuine need—and with over 500 members, our projects are now delivering meaningful impact. We’ve built a vibrant network of academics, industry experts, and early-career researchers, all working side by side. Consumer Lab has surpassed expectations, and I’m proud of the role we’re playing in shaping this thriving community. ”

Professor Jeff Brunstrom, Consumer Lab Hub Lead, University of Bristol

“ The work of the RIPEN Hub to-date has demonstrated that there is real passion to seize the opportunity afforded by industrial-academic collaboration. With each round of funding calls there is an increasing number of competitive applications, and a number of first round projects are now seeking further funding. The hub has given unrivalled opportunities for early career scientists to lead their first translational project and work with industry on relevant innovation with cross fertilisation of skills and expertise. In addition, the hub funding model has provided the opportunity for industry and academic collaborative proposals, that would have been unlikely to win funding from the main funding streams, to be granted resource to execute research which has the potential to make a difference to health. ”

Professor Gary Frost, RIPEN Hub Lead, Imperial College London

“ At our meetings there are always active discussions about our research themes. It’s brilliant to see how keen people from industry and academia are to join together, discuss research gaps and potential solutions. The range of projects we have been able to support from in vitro to human trials will really help to progress and translate science in the field. ”

Dr Gemma Walton, INFORM Hub Lead, University of Reading

“ The STAR Hub is bringing together an increasingly engaged community dedicated to developing innovative, plant-based dietary approaches tailored to different life stages. Collaboration across academia, industry and the third sector has grown steadily, and this is reflected in the breadth and ambition of the projects supported across our four challenge areas. Supporting early-career researchers remains central to our mission, and it is encouraging to provide opportunities that help them establish themselves within this emerging area of research. The hub is fostering constructive partnerships and creating an environment where evidence-driven innovation can take shape. ”

Dr Kourosh Ahmadi, STAR Hub Lead, University of Surrey

“ The Biofortification Hub has become a vital engine for new ideas, empowering our community to drive research that delivers healthier, more nutritious foods. By seeding early-stage projects, we’re accelerating solutions that can counter nutrition-poor foods and improve national and global wellbeing. ”

Professor Martin Warren, Biofortification Hub Lead, Quadram Institute



In the words of the funders

“By supporting innovative ideas at their earliest stages, we help turn scientific advances into real-world solutions that benefit both the UK population and the wider food sector. This investment drives business growth, fosters new partnerships, and ensures that novel, nutritious foods reach consumers, supporting public health and strengthening the UK's position as a leader in food innovation.”

Dr Andy Cureton, Director of AgriFood Systems, Innovate UK

“This initiative is facilitating new and productive research collaborations and approaches to address important nutrition and health challenges. The Consumer Lab hub, in particular, is providing momentum in the field of dietary behaviours research that will benefit underserved communities, as well as training the next generation of researchers.”

Dr Karen Finney, Programme Manager, MRC

“The Diet and Health OIRC programme demonstrates the value of bringing together businesses and researchers to address barriers to innovation across the food and drink sector. We have worked in partnership with UKRI throughout the development and delivery of the programme and look forward to engaging further as we continue to develop implementation plans for the food strategy.”

Professor Anjali Goswami FRS, Chief Scientific Adviser, Defra

The Diet and Health Open Innovation Research Club programme and its six innovation hubs

The Diet and Health OIRC is a £15 million, 5-year investment from BBSRC, Defra, MRC, and IUK supporting collaborative R&D between businesses, academics, policymakers and wider stakeholders.

The Diet and Health Open Innovation Research Club brings together businesses, researchers, government, and other stakeholders to address shared barriers to innovation in the food and drink sector with the aim of translating scientific advances into healthier and more sustainable products. With the British Nutrition Foundation (BNF) acting as a coordinator, the six OIRC hubs unite experts across nutrition, food science and behavioural science to address strategic priorities. A key strength of the programme lies in its coordination by the BNF. The BNF bring unparalleled insight into the UK nutrition landscape, enabling the innovation hubs to amplify their impact with an evidence led, user centred approach. This collaboration keeps the research community connected to policy, practice, and consumer needs ensuring clear routes to commercialisation and real world adoption and creates a legacy that will endure beyond the lifespan of the programme.

The hubs catalyse collaboration, build research capacity, provide thought leadership from world-class scientists and support the training of early career researchers and industry scientists. Ultimately, the goal is to build capability across the UK to tackle the most pressing challenges associated with improving national diets. Stronger cross-sector partnerships are also vital for ensuring that nutrition research informs public health programmes, clinical practice, and policy. Research must be grounded in an understanding of the many factors that influence food choices, including biological, psychological, social, economic and environmental determinants. By engaging stakeholders throughout the research process, from study design to dissemination, researchers can ensure that their work responds to real-world needs and is more likely to be implemented successfully. Industry is recognised as a crucial partner, given its central role in shaping the food environment and ability to deliver healthier products to consumers, and the Diet and Health OIRC programme has particularly supported SMEs in doing so.

The six Diet and Health OIRC hubs allocate devolved impact account funding through three schemes: Business Interaction Vouchers (BIVs), Feasibility Awards (FAs) and Flexible Mobility Awards (FMAs). This funding supports innovative research, collaboration and mobility between academia and industry in OIRC diet and health priorities, shaping the research necessary to drive the progress towards healthier and more sustainable diets. Each innovation hub can determine the balance and timing of awards as required to best support their areas. Additionally, each innovation hub offers free membership for the community to join and contribute to addressing diet and health challenges.



Biofortification

Increasing the nutritional value of food, feed and fodder



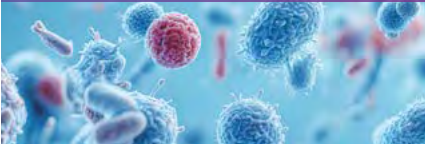
Consumer Lab

Learning more about real-food consumer behaviours around food



INFORM

Functional foods to improve health via gut microbiome



i-NutriLife

Food and drink to deliver improved nutrition across the life course



RIPEN

Understanding the interaction between food, nutrients and human physiology



STAR

Plant-based products to improve cognitive health across the life course



The key areas addressed by the hubs are:

- understanding the interplay between food components and human physiology
- improving health and nutrition through biofortification
- biological, social, and psychological determinants of food choice and eating behaviour
- development of functional foods and beverages
- understanding how food and beverages deliver improved nutrition across the life-course

Key figures at the programme midterm point

>2000

Members

>3000

People attended events

73

Projects awarded

£2.75m

Funding invested



The Diet and Health Open Innovation Research Club programme and its aligned competition

In 2024, BBSRC and Innovate UK invested £2.5 million to drive the design and development of innovative food and beverage products. The early-stage feasibility projects used the funding to assess and test new ideas, determining their viability before committing to larger-scale projects. These projects have the potential to enhance the nutritional quality of food and beverage products consumed by the UK population, ultimately supporting health and wellbeing across the life course.

The projects focused on areas such as:

- novel and functional foods to support healthy ageing across the life course
- creating probiotics and prebiotics to improve gut health
- biofortification as an approach to target delivery of bioactive compounds

Nine research organisations and 16 businesses were supported by this funding, which has enabled the establishment of strong collaborations between academia and industry, resulting in new products and innovations, further private investments and follow-on activities and funding.

£2.5m
To drive design
and development

9
Research
organisations
supported

16
Businesses
supported

The image is a composite. The top half features a purple gradient background with a faint, repeating pattern of hexagons. The bottom half shows a man in profile, wearing a white lab coat and a white hairnet, holding a silver tablet. He is standing in a greenhouse, with rows of green plants visible in the background. The overall design includes yellow and purple horizontal bars.

Diet and Health Open Innovation Research Club: project case studies

Exploring the anti-inflammatory mechanisms of Ahiflower® oil – a sustainable alternative to marine omega-3s

Ella Baker: University of Southampton,
in partnership with Natures Crops International (NCI)

PROJECT SUMMARY

Omega-3 polyunsaturated fatty acids (PUFAs) eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) support healthy ageing by lowering inflammation, yet current fish stocks may not meet future demand. Ahiflower® oil, derived from *Buglossoides arvensis*, is a sustainable plant-based source of alpha-linolenic acid (ALA), stearidonic acid (SDA) and gamma-linolenic acid (GLA). This project compared an Ahiflower oil blend with a fish oil blend in THP-1 monocytes to assess its potential as a scalable alternative to marine omega-3s and to understand how it may support healthy ageing while reducing dependence on finite marine resources.

PROJECT OUTCOMES SO FAR

The collaboration between the University of Southampton and Natures Crops International (NCI) has delivered strong early evidence that Ahiflower oil modulates inflammation-related biomarkers in THP-1 monocytes. The project generated high-quality cytokine, oxylipin and mitochondrial data using ELISA, UPLC-MS/MS and Seahorse XF analysis, supporting forthcoming publication. It also provided valuable translational research and leadership experience for early career researcher Dr Ella Baker, strengthening her skills in lipidomics, immunometabolism and industry collaboration.

FOLLOW-ON ACTIVITIES

The preliminary data supported a RIPEN Hub Progression Award (£44,690) with NCI to develop lipidomic methodology for analysing Ahiflower oil's effects on inflammatory lipid signalling. These findings also strengthened a full BBSRC responsive mode application with NCI and four UK SMEs to co-develop and commercialise omega-3-fortified foods, supporting SME growth and the UK sustainable nutrition sector.

“The Business Interaction Voucher enabled sophisticated analyses beyond our SME's capacity. These results show real potential for Ahiflower oil to enter food and medical nutrition markets as a clean, sustainable omega-3 source.”

Greg Cumberford, NCI



Buglossoides arvensis

Omega-3 enhanced tomatoes (O3TOM)

Johnathan Napier and Richard Haslam: Rothamsted Research, in partnership with Eugenio Butelli and Cathie Martin: John Innes Centre and Norfolk Plant Sciences Ltd



Dr Susana Silvestre,
Rothamsted Research

PROJECT AIM

To produce tomatoes with enhanced nutritional composition, specifically by the accumulation of omega-3 PUFAs.

SUMMARY

The aim of this project funded by the Biofortification Hub (one of six hubs funded by BBSRC as part of the Diet and Health Open Innovation Research Club) was to create an entirely novel source of healthy omega-3 long chain polyunsaturated fatty acids (PUFAs), by using genetic modification to engineer tomatoes so that they accumulate EPA and DHA in their fruit. This would provide a new and sustainable source of 'fish oils' that was not dependent on marine extraction and could provide a dietary source of EPA and DHA for people who do not eat animal products. Tomatoes are widely consumed, and nutritionally enhanced fruit represent an excellent conduit for improved diet. Although this project was modest in scale, it made very significant progress and resulted in the creation of multiple tomato lines that accumulate EPA in either the fruit or seeds. Lipidomic and genomic analyses of our enhanced tomatoes are ongoing, but it is clear that tomato fruit is an excellent vehicle for the delivery of EPA, with the best lines containing ~8% of total fatty acids as this healthy omega-3 not normally found in plants.

NEXT STEPS

In this first iteration we focused on demonstrating that tomato fruit could serve as an efficient host for the accumulation of EPA. In the next iterations, we are boosting the levels of omega-3 and also engineering the accumulation of DHA. The results from this project have been patented and will subsequently be published, and we are looking at different mechanisms to take this innovation forward.

“ This has been an amazingly successful and enjoyable collaboration. We have done something that is novel but more importantly has utility and societal value. I am immensely proud of our collective achievements. ”

Johnathan Napier, Project Lead, Rothamsted Research

Guide to prebiotic products available in the UK

Sarah Danaher: University of Reading, in partnership with AEProbio and BHSoft

The Guide to Prebiotic Products Available in the UK – launched April 2025 – is the first fully independent, evidence-based resource designed to support healthcare professionals and the public in navigating the rapidly expanding prebiotic market. Free from commercial influence and developed through the Diet and Health OIRC INFORM Hub with BBSRC Flexible Mobility Award funding, the Guide offers a clear, science-led overview of prebiotic ingredients and the products available on UK shelves.

Although robust clinical evidence exists, both the public and many healthcare professionals remain largely unaware of the significant public-health potential of prebiotics. When taken at clinically effective doses, specific prebiotic fibres have demonstrated benefits for gastrointestinal health, metabolic outcomes such as type 2 diabetes and weight management, mineral absorption e.g. calcium and iron, immunity, and aspects of mental health. Yet these safe, accessible non-pharmacological treatment options remain underused.

The Prebiotic Guide seeks to change this by providing transparent, unbiased information that empowers patients and healthcare professionals to make informed, evidence-based choices – supporting personalised care, wider treatment options, and improved health outcomes.

PROJECT OUTCOMES SO FAR

Achievements include a systematic review of human RCTs on key prebiotic fibres (inulin/FOS, GOS, β -GOS, PHGG), development of a structured evidence database, and mapping of commercially available UK products across retail and online sectors. Early clinical-practice notes are underway, and the project has strengthened academic–clinical–industry collaborations.

FOLLOW-ON ACTIVITIES

Next steps include full guide production, peer review by UK microbiome experts, and development of a publicly accessible website.

“ This funding has enabled us to transform complex prebiotic science into a clear, trusted resource – expanding non-pharmacological treatment options and empowering both clinicians and the public to make evidence-led choices. ”

Sarah Danaher, University of Reading



An inulin-supplemented food product to improve bowel frequency

Edward Chambers: Imperial College London, in partnership with
Glatt Protech and Reginald Ames



PROJECT SUMMARY

Constipation affects around 15% of UK adults and has substantial impacts on physical and mental wellbeing. Inulin, a prebiotic dietary fibre, carries an EFSA-approved health claim for increasing bowel frequency. Tea presents an ideal delivery vehicle, as more than half of UK adults consume at least four cups daily. Delivering 3g inulin per teabag would allow a typical daily tea drinker to meet the 12g/day inulin intake required for gut-health benefits. However, inulin has a small and inconsistent particle size, making it incompatible with commercial teabag packing.

PROJECT OUTCOMES

This project developed a novel formulation method to increase inulin particle size while reducing residual moisture to below 1%, producing a free-flowing ingredient suitable for blending with tea. The resulting 50:50 inulin:tea blend proved fully compatible with high-throughput teabag packing. Feasibility trials exceeded expectations, with up to 8g of blend (4g inulin) successfully packed into standard teabags. Sensory testing confirmed no detectable change in flavour, colour, or mouthfeel. Independent analysis (Campden BRI) showed that the inulin dissolved effectively within a standard 5-minute infusion in boiling water.

FOLLOW-ON ACTIVITIES

Planned next steps include pilot-scale manufacturing, consumer testing, and exploration of commercial partnerships. The formulation process has clear potential for IP protection and offers a promising route to market for a simple, acceptable dietary intervention to improve gut health.

“ This feasibility award has enabled a unique collaboration that brings together Glatt’s world-leading expertise in particle design and process technology, Reginald Ames’ long-standing experience in commercial teabag manufacturing, and Imperial College’s applied human nutrition research. By integrating these complementary strengths, the project has allowed us to overcome a very specific technical barrier, thereby accelerating the translation of nutritional science into a scalable consumer product. ”

Edward Chambers, Imperial College London

Reducing the carbon footprint of a high street restaurant chain by nudging consumers toward healthier, lower carbon meals

Katy Tapper: City St George's, University of London, in partnership with Benugo and Wahaca

This business interaction voucher allowed academics from City St George's to work with Benugo and Wahaca to explore different strategies for promoting healthier, lower carbon footprint menu choices at several different types of food venues. We found that at a music venue we could boost sales of a healthier item by placing it first on the menu. We also found that in a restaurant setting we could increase sales of selected dishes by highlighting both their pleasurable and eco-friendly properties – though this strategy was not effective in a café setting. The project supported the career development of the early career researcher employed on the grant who has gone on to secure his own business interaction voucher for related work. The project has also led to ongoing collaborations between City St George's and several organisations working within or alongside the hospitality sector. These include HEIF funded work with Benugo, the Science Museum and the UK Edible Insect Association.

“ The business interaction voucher was very effective at helping us further develop and expand our industry links. It gave us the opportunity to build relationships, experiment with different ideas, and develop a better understanding of the challenges the hospitality sector faces when trying to balance health and environmental impacts with business viability. We are looking forward to continuing to build on our work in this area. ”

Katy Tapper, Project Lead

Examples of 'table talkers' used at the Royal Parks Cafes and Wahaca



Structural design of more satiating foods

Caroline Millman and Anna Sorsby: Sheffield Hallam University, in partnership with **Cathrina Edwards:** Quadram Institute, and New Food Innovation



This feasibility study assessed the effect of food products enriched with PulseON® on glycaemic response and subjective satiety responses. PulseON® is a unique flour made 100% from pulses, but unlike other flours it has been obtained through an alternative milling process (WO2019155190) which preserves whole plant cells. This informs the evidence-led marketing strategy for delivery of healthier everyday foods.

PROJECT OUTCOMES

- Range of palatable products developed using PulseON® (pizza, biscuits, granola, muffins, pasta and crackers). The latter taken forward for satiety study.
- Taking into account PulseON® dose and product type, we advanced an understanding of specific improvements that are best suited for appetite claims.
- Provided data to further substantiate and exploit the patent PCT GB2208002.2 'Satiety Promoting Compositions, Foodstuffs and Methods of Production Thereof'.
- Timely step towards addressing the demand for satiety-promoting foods, providing data to further inform the PulseON® business development strategy.
- Successful completion of a randomised cross-over study (n=31) to assess glycaemic response and markers of appetite.

FOLLOW-ON-ACTIVITIES

- Collaborations have been formed between parties outside of this project to consider future opportunities (commercial and research).
- Future funding for a follow-on project is being sought and outputs are being drafted. Consideration of food products / ingredients for inclusion in a long-term study focusing on populations with low fibre intake and pre-diabetes.
- The award has provided Early Career Researchers with opportunities to contribute to the research with the intent of using the outputs towards a PhD by publication. The Research Assistants have progressed to further research positions.

“ This project has developed and strengthened collaborations between industry and academia while supporting the next generation of researchers by fostering research independence. ”

Microbial protein for human consumption: towards sustainable protein production

Anthony Watson and Rebecca Townsend: Newcastle University, in partnership with **Matt Longshaw:** Calysta and Aelius Biotech

PROJECT SUMMARY

This feasibility project explored microbial protein, derived through cellular agriculture using fermentation technology, as a viable, sustainable and high-quality protein for human consumption. The project had three work packages the first involved conducting a market analysis to identify opportunities and challenges for incorporating microbial protein into existing food products, assessing its potential to improve the protein quality of plant-based foods. Second, the project evaluated the protein quality and digestibility of reformulated products using advanced models simulating human gastrointestinal processes. Third, consumer perceptions, facilitators for, and barriers to, adopting microbial protein were investigated, addressing safety, health and sustainability concerns.

Overall, findings from this project highlight that microbial protein can be used to significantly improve the protein quality and quality (as measured using PDCAAS) of plant-based dairy and meat analogues, including plant-based yoghurts, milks and burgers. Prospective acceptability of microbial protein is context-dependent and shaped by trust, emotion, and perception of risk and safety. Effects are largely influenced by modifiable psychological constructs, particularly perceived capability.

PROJECT OUTCOMES

The project has so far produced one publication and a further three are currently under review. The project supported the training of one early career researcher, one undergraduate nutrition placement student, and one postgraduate psychology student.

FOLLOW-ON ACTIVITIES

We hope to build on the promising findings from the project, and discussions are underway to develop future applications to fund follow-on human postprandial metabolic response and acceptability trials.

“ This project has enabled academics and industry partners to collaborate on research that produces outcomes applicable to real-world contexts. Findings will provide key stakeholders with information on the application of microbial protein in food reformulation and the barriers and facilitators to guide consumer adoption of the novel protein source. ”

Anthony Watson, Newcastle University



Efficacy of transgenic plant derived n-3 PUFAs in the prevention of menopause mediated brain dysregulation

Matthew Pontifex: University of East Anglia, in partnership with Rothamsted Research and Yield10 Bioscience



Menopause is associated with cognitive decline and disruptions in brain lipid regulation, signalling, and metabolism. While marine-derived n-3 PUFAs are known to offer neuroprotective benefits, the efficacy of novel (and more sustainable) plant-derived n-3 PUFAs remains unclear. The project compared the efficacy of these two n-3 PUFAs at preventing menopause-related brain disturbances.

OUTCOME OF RESULTS

- Our results provide further evidence of the efficacy of n-3 Polyunsaturated fatty acids (PUFAs) interventions in the context of menopause mediated brain dysregulation.
- While marine n-3 PUFAs appear to confer slightly greater efficacy, the analysis identifies key differences and overlaps between the two sources, particularly in cognitive outcomes and lipid profile changes. These insights will help guide the development of more effective and sustainable n-3 PUFA-based interventions in the future.

PROJECT OUTCOMES

- First significant funding source for early career researcher Matthew Pontifex to lead and complete a project
- Publication in preparation and expected to be submitted in early 2026

FOLLOW-ON ACTIVITIES

- Additional funding is being sought to continue this research

“To my knowledge, this is the first study to assess the incorporation of (transgenic) plant-derived n-3 PUFAs into the brain. The i-NutriLife funding enabled me to experience working with both collaborators and industry partners, which is invaluable for an ECR.”

Matthew Pontifex, University of East Anglia

Art Infusion for Healthier Choices (AIRES)

Laura Wilkinson: Swansea University, in partnership with Twisted Orange

Shifting consumer eating behaviours towards healthier and more sustainable options continues to be a key challenge. The AIRES project considered 'Art Infusion' (influence of art on product perception) as an alternative approach. For phase 1, we worked collaboratively with our project partner, Twisted Orange, to develop a food industry optimised methodology utilising art to explore consumer perceptions in an inclusive way that avoided cliché responses. Informed by phase 1, we then co-produced food product designs with professional artists (Red Cliff Design and Alice Draws The Line) and tested consumer responses experimentally. We have now been able to utilise our developed protocol in further funded projects with industry partners including Cleobury PM, Really Wild Emporium and Swig Smoothies, supporting innovation in food formulation and reformulation with the goal of contributing to a healthier and more sustainable food system. This project has also contributed to the continued collaboration of Swansea University and Twisted Orange via 'Kaleidoscope' a joint endeavour supported by a UKRI Zinc Catalyst and Accelerator project.



Artwork produced by a participant on the topic of sustainable eating behaviours

“ The opportunity that this funding has provided to work with an industry partner on methodology development and validation has been invaluable to ensuring that we collect high quality data that is optimised to support translation and impact for food industry, particularly SMEs, who are driven by a health and sustainability mission. ”

Laura Wilkinson, Swansea University

Elevating omega-3 fatty acid, vitamin E and microelement content of eggs, supporting diet, climate and biodiversity targets

Wendy Russell: The Rowett Institute, University of Aberdeen, in partnership with Duncan Farms Limited



Our research has been instrumental in regenerating the hemp industry in Scotland and building the supply chain. One of our major concerns was the significant risk to the poultry and pig sectors due to dependence on imported soya, threatened by several geopolitical factors including deforestation legislation, China's huge demand and trade instability. Home-grown protein solutions are essential to ensure our future food security. Working with Duncan Farms we demonstrated that hemp (a versatile/low-input/carbon-capturing plant) successfully replaced soya cake with no detriment to hen welfare, egg production or taste. The lower-carbon egg produced had an enhanced nutritional profile being more than double in omega-3 and vitamin E and significantly higher in vitamin A. Replacing soya would require hemp to be grown at scale also delivering hemp oil (a healthy/low-input alternative to rapeseed) as a co-product. Transitioning to hemp would substantially reduce agricultural emissions, deliver new market opportunities and support decarbonising the livestock sector and a healthier population. Duncan Farms are in discussion with a major retailer who have an interest in the product if hemp production can be scaled. We hosted a workshop with all supply chain actors, identifying a viable route to meeting the poultry and pig sector need. This resulted in production of a policy brief and road map for delivery, which contributed to the Scottish Government hosting a national hemp conference and the submission of a proposal to fund the necessary infrastructure and coordination. This work has also received high-level media attention including national coverage on BBC Breakfast.

"Duncan Farms are thrilled to have been part of this project alongside the Rowett Institute implementing diet changes to include hemp at varying levels in the diet of our laying hens. By successfully replacing soy with hemp seed cake, we observed no detriment to the health of our hens or the sensorial properties of the eggs. It was very encouraging to see that the eggs tested as part of the trial saw significantly increased levels of vitamin E, as well as omega-3 and omega-6 fatty acids. This improvement is crucial from both a health and climate perspective. If fully implemented, the enhanced nutritional profile of our eggs would contribute to better health for our consumers. Additionally, reducing reliance on soy, especially given its association with deforestation, aligns with our commitment to environmental sustainability. This shift would not only help combat climate change but also position us well against the anticipated rising costs of soy due to bans from countries involved in deforestation activities. Working with the Rowett institute has been an absolute pleasure. The expertise and support throughout this trial has been invaluable."

“ We are proud to have worked alongside the Rowett Institute to help develop a more sustainable and nutritious egg. ”

Duncan Farms

(Poly)phenols and probiotics to improve menopausal symptoms via the gut-brain axis

Ana Rodriguez-Mateos: King's College London, in partnership with The University of Roehampton and Invivo Healthcare

PROJECT SUMMARY

SymptoGut is a business interaction voucher project supported by the i-NutriLife innovation hub with King's College London, Roehampton University and Invivo Healthcare as partners. A 20-week, double-blind, randomised crossover trial in 16 postmenopausal women investigated whether a targeted combination of dietary (poly)phenols and specific probiotic strains can modulate gut-brain axis signalling to support menopausal health.

PROJECT OUTCOMES SO FAR

The findings indicate benefits relevant to menopausal wellbeing following daily consumption of both a combined (poly)phenol-probiotic and a (poly) phenol only formulation. Both interventions were feasible, well tolerated and associated with no reported side effects. The combined approach improved thinking, learning, memory and concentration, accompanied by marked increases in plasma and urinary (poly)phenol metabolites, consistent with enhanced bioavailability when probiotics are included. The (poly)phenol-only formulation led to improvements in energy/fatigue, sexual activity, and opportunities for acquiring new information and skills. Microbiome profiling revealed distinct signatures for each intervention. The combined formulation increased taxa involved in short-chain-fatty-acid production, including *Phascolarctobacterium* spp., whereas the (poly) phenol-only intervention reduced selected opportunistic genera such as *Clostridium* spp., increased *Fusicatenibacter* spp., abundance and produced shifts within *Lachnospiraceae* groups. Together, these observations support synergistic interactions between probiotics and (poly)phenols in modulating gut-brain pathways. An early-career researcher led method development in metabolomics and microbiome analysis, expanding analytical capacity within the team.

FOLLOW-ON ACTIVITIES

Project partners are now preparing a grant application to validate mechanistic markers, evaluate long-term symptom trajectories, and explore the co-development of a prototype nutraceutical and personalised intervention strategies.

“ This funding has enabled us to generate pilot evidence suggesting that plant bioactives and probiotics may support menopausal and women's health, helping us translate early findings into larger clinical studies. ”

Ana Rodriguez-Mateos, King's College London



Food4PD – validation of a novel functional food designed to meet the nutritional needs of people living with Parkinson’s disease

Catherine Hughes: Ulster University, in partnership with University of Leeds, University of Auckland, ABC Nutritionals Ltd and My Moves Matter Ltd



Parkinson's Disease (PD), the second most common neurodegenerative disease globally, is associated with significant motor and non-motor symptoms. Gastrointestinal (GI) symptoms, particularly constipation, are highly prevalent and emerging evidence highlights the role of gut microbiome dysbiosis and nutritional deficiencies in PD progression, yet dietary interventions remain underexplored. The Food4PD project aimed to address this gap. In collaboration with the industry partner, ABC Nutritionals, the team developed a bespoke functional drink (enriched with chicory inulin, B-vitamins, and vitamin D) tailored to address the needs of people living with PD. The effectiveness of this functional drink in alleviating constipation, improving nutritional status, and microbiome profiles in people living with PD was then evaluated through a randomised controlled trial. The project also enabled the research team to establish stronger working relationships with the Parkinson's community, including charities, support groups, and individuals living with the condition. These interactions have provided us with valuable insights into the lived experiences of people living with PD, ensuring that the project and all follow-on activities remain aligned with the needs and priorities of people living with PD. Building on the success of Food4PD, the team has secured additional funding, through the NILAB BBSRC-funded doctoral training programme, to further explore the role of nutrition, and its interactions with other biological and environmental risk factors, in the development and management of PD using AI approaches. We were also successful in obtaining additional funding from the OIRC INFORM Hub to produce an impact report that explores the potential beneficial effects (both health and economic) of implementing prebiotic supplementation in people with PD on a UK-wide scale. Overall, this project and related follow-on activities are aimed at increasing our understanding of the role of nutrition in PD and ultimately improving the quality of life for people living with PD.

“ This funding was instrumental in establishing a multidisciplinary team dedicated to improving the lives of people with living with Parkinson’s disease, enabling us to build a strong track record and to partner with the food-industry to develop high-quality food product aimed at alleviating constipation and improving nutritional status in people living with PD. The project has also helped raise awareness about the nutritional issues faced by people living with PD and established the foundation for further research in this area. ”

Catherine Hughes, Ulster University



Diet and Health Innovation: early-stage feasibility project abstracts



Nettle (*Urtica dioica* L.): drying, processing and encapsulation to preserve organoleptic characteristics and health benefits

Project partners: Cleobury Project Management Ltd, Swansea University, PhytoQuest Ltd



Urtica dioica

This feasibility project explored how drying, processing and encapsulation of *Urtica dioica* (nettle) can retain organoleptic and bioactive properties for use in functional food and drink applications. The work addressed the UK's challenge to deliver sustainable, nutrient-dense foods that promote healthy ageing and reduce diet-related disease.

Using advanced spray drying and encapsulation methods, nettle powders were optimised for infusion and incorporation into convenience products such as baked goods, teas and oat-based drinks. Analytical work demonstrated strong retention of polyphenols and antioxidant capacity following encapsulation, alongside other bioactives. We found inhibitions of alpha- and beta-glucosidases and beta-glucuronidase and hexosaminidase (N-acetyl-beta-D-glucosaminidase). Promotion of alpha-galactosidase and Cerezyme (recombinant human glucocerebrosidase) activities was seen.

Consumer insight (via a visual focus group, conjoint experiment and follow-up engagement sessions) shaped the innovation journey, particularly with respect to the feasibility of a natural carrier ingredient such as pea protein or potato starch, which was overwhelmingly favoured by consumers. This evidence-led design process guided formulation, messaging, and the selection of carriers aligned with consumer expectations of clean-label, plant-based products.

The project delivered standard operating procedures (SOPs) for botanical encapsulation, identified sustainable local supply chains, and validated the feasibility of incorporating encapsulated powders into functional foods. Outcomes include improved understanding of processing impacts on bioactive retention and clear commercial pathways for sustainable UK-grown botanicals.

Partnership outcomes include a Nuffield Farming Scholarship, participation in the Agri-Tech 'Land x Launch' incubator, Further Innovate UK and SBRI funding and dissemination through international forums such as NHT summit, EuroDrying, BDTG conference and Vitafoods Europe, as well as a publication in 'Foods'.

“ This funding has been transformative in connecting science and application – enabling us to combine academic insight with industry expertise to create sustainable, bioactive-rich food ingredients from UK-grown nettle. The collaboration has accelerated innovation in natural encapsulation, supporting healthier diets and adding value to local agricultural supply chains. ”

Amanda Lloyd, Cleobury Project Management Ltd

Superior synbiotics for healthy ageing

Project partners: NCIMB Ltd, University of Aberdeen

Aging is associated with a progressive decline in gut microbiome diversity and functionality, contributing to a state of low-grade chronic systemic inflammation and immunosenescence. These changes compromise host defence mechanisms, rendering elderly individuals more susceptible to infections and age-related diseases. We are developing an advanced synbiotic formulation tailored to support gut microbial homeostasis and enhance immune function in the elderly population. The proposed synbiotic seeks to restore microbial diversity, reduce inflammatory signalling, and reinforce mucosal immunity. Central to the formulation is a robust, butyrate-producing *Clostridium butyricum* strain. Selected bifidobacterial species will serve as acetate- and lactate-producing anchor strains, with a prebiotic compound that promotes cross-feeding of strains for optimal short-chain fatty acid (SCFA) production. The formulation will be evaluated for its compatibility, stability, and immunomodulatory effects, to deliver a clinically effective intervention to promote resilience and longevity in aging populations.

Using co-culture techniques, we have identified four synbiotic combinations that show compatibility and optimal SCFA production. These combinations show consistent production of acetate, lactate, and butyrate, indicating a synergised population. Whole-genome sequencing of the selected strains showed a lack of antibiotic resistance and virulence factors, supporting their safety for human applications. To better simulate the gut microbiota, the synbiotic consortia were introduced into mixed ecosystem batch cultures primed with faecal slurries from elderly donors, which more closely reflects age-associated microbial dynamics. Interim results show stable growth and compatibility among the strains. Further analyses, including SCFA profiling, anti-pathogen assays, and immunomodulatory evaluation, will indicate if the consortia provide a benefit above the strains or prebiotic alone.



Milk-free production of recombinant osteopontin to enable supplementation in baby, elderly, and sports nutrition

Project partners: Better Dairy Ltd, The Biorenewables Development Centre Ltd



Osteopontin (OPN) is a multifunctional protein found in many tissues including bone, skin, and kidneys, with the highest concentration occurring in milk. OPN has been the subject of extensive investigation due to its therapeutic and nutritional potential, driven by its multifaceted physiological roles. These include immune system development, wound repair, modulation of bone and tissue mineralisation, and calcification prevention. Consequently, OPN is a high-value target for functional ingredients, with clear roles in infant immunity, elderly nutrition, and bone health. However, the current supply chain is not sustainable: isolation from bovine milk is inefficient and costly, with approximately 40,000L of bovine milk required for 1kg of OPN. These barriers have prevented OPN from becoming a standard ingredient in mass-market nutritional products.

To address this, Better Dairy is utilising precision fermentation to establish a recombinant production platform for OPN and other dairy proteins. OPN bioactivity is distinctive in its reliance on complex post-translational modifications (PTMs). By combining Better Dairy's expertise in synthetic biology with the Biorenewables Development Centre's (BDC) process optimisation capabilities, we are successfully engineering yeast cells to synthesise fully functional OPN, and optimising fermentation conditions to achieve high titres. This project demonstrates a scalable fermentation process that achieves high product titres with significant potential to reduce water usage and greenhouse gas emissions. By decoupling OPN production from bovine sources, this work enables the development of sustainable, cost-effective, and bioactive nutritional products.

BiomeBakery

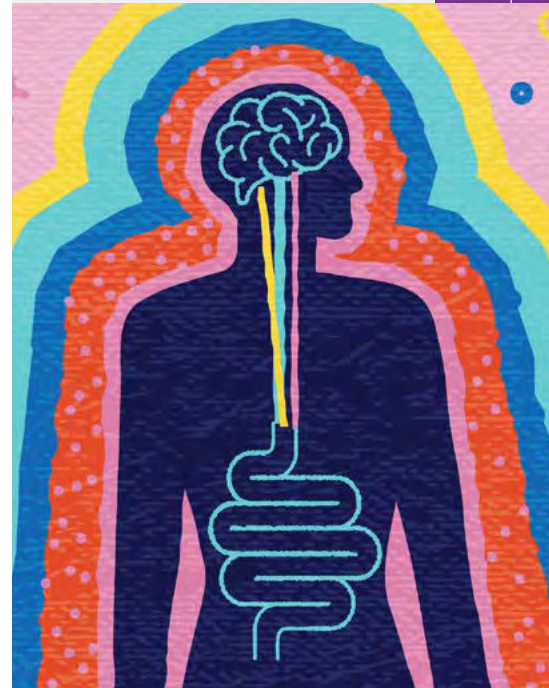
Project partners: Myota Ltd, University of Reading, Puratos Ltd, Thriva Ltd

In the BiomeBakery project, we have developed a novel prebiotic-fortified bread roll designed to support cognitive and mental health for the ageing UK population. Acting via the gut microbiome, this innovation represents the first product of its kind worldwide. Cognitive decline is a leading concern in ageing and imposes substantial personal, societal, and economic burdens. With cases of cognitive decline doubling in the past decade in the UK, there is increasing recognition of the need for preventive strategies in midlife, before symptoms arise.

Recent research, including collaborative studies by Myota, Thriva, and the University of Reading, has demonstrated that prebiotic fibre – the primary food source for gut microbiota - can slow cognitive decline, improve mood, and reduce inflammation in older adults (Hall et al., 2024). Despite these benefits, over 90% of UK adults fail to consume sufficient prebiotic fibre, with intakes particularly low in older populations, where dietary habits are more resistant to change.

To address this, the project adopted a fortification approach, creating a product that is familiar, trusted, convenient, and palatable. Partnering with Puratos, a world-leading bakery manufacturer, we successfully developed a bread roll containing 10g of prebiotic fibre per serving.

We are currently conducting a 12-week, double-blind, placebo-controlled randomised trial to evaluate whether daily consumption of this prebiotic-fortified bread roll improves cognitive function, mental health, and reduces markers of inflammation in healthy older adults, compared to a standard bread roll. This work represents a novel, food-based strategy to support healthy cognitive ageing and provides a scalable approach to improving dietary prebiotic intake in older populations. Results are anticipated from this trial end of March.



FORTYEAST

Project partners: Biopower Technologies Ltd, University of Leeds, Agrifood X Ltd



The production of renewable feedstocks for sustainable bioprocessing and biofuel development is a current topic of commercial interest. Food production comes with inherent waste production such as the disposal of avocado kernels, mango peel and others which are normally sent for animal feed, anaerobic digestion or burnt. The consortium research is focused on the conversion of these food wastes into a media capable of supporting yeast fermentation. Conversion of the food waste has focused on the use of commercial vinegars for the hydrolysis of the long-chain polymers such as starch, cellulose and pectin into fermentable sugars (glucose, fructose). The conversion of these sugars into higher value compounds in yeast fermentation has been determined analytically by nuclear magnetic resonance (NMR) and the impact of the media on the mineral content of the yeast cell determined. This analysis has revealed that food waste such as mango peels and avocado nuts can after hydrolysis support yeast fermentation and produce high value compounds such as fatty acids, medically relevant sugars, antioxidants and chromophores suitable for dyeing textiles.

This project has started to reveal the complexity of the products made by yeast as it ferments these complex and challenging components. The project has identified some commercially relevant compounds with a view to scale-up and future project applications. Led by BioPower, the project has reinforced the relationships between the consortium partners of the grant and the academic partner to gain an understanding of valorising food waste in the UK and beyond.

Microencapsulation of probiotic strains to improve the performance of probiotic products, therefore their impact on human health

Project partners: Xampla Ltd, Quadram Institute Bioscience

To qualify as a probiotic, a strain must be well-defined, present and alive in significant numbers in the gut, and deliver a proven health benefit. One key challenge is ensuring probiotics survive product manufacturing, shelf life and reach the gut in a viable state.

Probiotics are highly sensitive to factors such as oxygen exposure, pH imbalance, and pasteurisation, making it challenging to maintain their viability during production, shelf-life and digestion.

To date, the industry has been limited by the products they can add probiotics into, and the strains they can use. Xampla's microencapsulation technology aims to protect probiotics throughout manufacturing, transit, and storage, ensuring they reach consumers with full efficacy.

This innovation aims to extend the shelf-life of refrigerated and ambient probiotics while ensuring enteric release once consumed and enabling the addition of other beneficial strains to a much wider range of products. This will increase the accessibility and diversity of available strains, maximising the health benefits.

Xampla's microencapsulation technology has proven effective in protecting vitamin D in fortified drinks for Britvic. This technology utilises natural plant polymers to create innovative, high-performing microcapsules, ensuring product stability even under challenging conditions.

The global probiotics market is expected to see rapid growth in the coming years, projected to increase from £77 billion in 2024 to £170 billion in 2030. This surge in demand underpins the importance of innovative solutions, which address key challenges in probiotic delivery and offer new opportunities for product development and consumer health benefits.

“ The funding brings together the expertise of Xampla and Quadram Institute to accelerate this exciting innovation of microencapsulated probiotics. Quadram's existing data demonstrates the enteric release of our microcapsules. We are excited about the results and future impact of their study of our encapsulated probiotic in an in-vitro colon model. ”

Xampla Ltd

Digestibility and gut health of plant-based food ingredients

Project partners: SPG Innovation Ltd, University of Leeds

Textured vegetable proteins (TVPs) are versatile ingredients dominating the UK alternative protein industry; added to provide meat-like texture and commonly made with highly processed protein isolates (typically soy/wheat). There has been minimal research to date on the impact of plant based proteins on gut health.

Our goal has been to shift from using highly processed commodity isolates to less processed ingredients, diverse/underutilised crops and food industry by-products. With a pilot scale extruder in-house, we have a wealth/depth of knowledge in this area. Blending proteins for optimal amino acid, digestibility and functionality has been pivotal in this project.

The key to this project has been understanding digestibility and health impacts of our TVPs on microbiota. SPG's blended TVPs, that offer more than just a protein source, are commercially unique.

We have developed ingredients that have reduced antinutrients, enhanced digestibility and protein quality for MiGut analysis (non-digested/soluble fraction assessment).

MiGut is a novel high-throughput gut model capable of measuring the interaction between nutrients and human gut microbiota. This model consists of three linked vessels that mimic the physiochemical conditions (pH, peristalsis, flow rate, temperature, and anaerobicity) of the human proximal, medial, and distal colon. The model is continuously fed media that can mimic the intake of different diets and nutrients, or supplements, can be added at specific times during the day. The purpose is to distinguish the effect on the microbiome when shifted to the plant-based diet. The impact of this dietary change will be linked to potential (positive/negative) health impacts.

“ We started this project with a review of current science and found that there was very little data on the impact of plant-based proteins, especially TVPs, on gut health. This project has allowed us to accelerate the studies needed to evidence the impacts; without funding SPG Innovation, an SME, would not have been able to access the MiGut model and expertise within the University of Leeds. This project has enabled us to further the science as well as our commercial offering as plant protein experts. The collaboration has enabled us to be part of the NAPIC centre and boosted our scientific activity. ”

Sarah Gaunt, SPG Innovation Ltd

Smarter food – the development of a biofortified functional and accessible convenience bar for improved metabolic health

Project partners: The Smarter Food Company Ltd, Norwich University of the Arts

This project explored the feasibility of designing and developing an innovative nutritional snack, fortified with broccoli-derived glucoraphanin (GR), a stable precursor to sulforaphane, a compound known to provide a range of sustained health and wellbeing impacts including antioxidant production, inflammation reduction and improved cell repair. Based on a proven link between sulforaphane and improved glycaemic control, the product will initially target the UK's 7 million prediabetics and 4.3 million Type-2 (T2D) diabetics, to support improved adherence to sustainable healthy eating behaviours. The concept builds on 30 years of research demonstrating the benefit of sulforaphane for supporting metabolic health. However, adding sulforaphane to our diet in high enough doses to be effective represents a critical challenge. As such, The Smarter Food Company (TSFC) has developed GRextra, a unique strain of biofortified broccoli containing ~5x more glucoraphanin than traditional varieties, providing a rich source of vitamins, nutrients, bioactive molecules and dietary fibre.

In collaboration with Norwich University of the Arts (NUoA), TSFC has conducted a feasibility study around user-centred product design to establish the optimum presentation and organoleptic profile for a snack product, including development and trialling of prototype formulations combining GRextra with a blend of other functional and compatible ingredients. Project outcomes will provide TSFC with a new product that can capture a wider market share (potential 5-year cumulative revenue of over £34 million), appealing to customers who struggle to sustain healthy eating behaviours and support improved vegetable/fibre consumption.



SPINLife: sustainable polyphenols for improved nutrition across the lifespan

Project partners: AgriFood X Ltd, University of Leeds, Biopower Technologies Ltd



SPINLife aims to evaluate the feasibility of reducing the incidence and severity of inflammation-driven disorders, such as irritable bowel disease, through biofortification of widely consumed foods with polyphenol-rich ingredients to improve gut health. The challenges to be addressed include:

- cost-effective, production of shelf-stable, polyphenol-rich ingredients
- incorporation into widely consumed food products without impacting manufacturing processes or finished product sensory attributes
- retention of beneficial effects, while ensuring affordability, palatability and consumer acceptance

The consortium prepared a range of polyphenol-rich materials from agri-food by-products using methods such as mechanical cavitation and solid phase extraction. These have been stabilised by encapsulation (through use of by-product derived proteins) and then spray-dried or freeze-dried to generate polyphenol-rich dry powders, suitable for use as ingredients for food biofortification. Encapsulation efficiency ranged from 83-99% for betalains and anthocyanins, while for all powders moisture content was <5% and water activity <0.3, indicating a low susceptibility to microbial growth. Polyphenol-rich powders have been successfully incorporated into baked goods (muffins for example) often without significant impact on consumer acceptance. Fortified food products are currently being tested to determine polyphenol stability and bioaccessibility using in vitro digestion, while in vitro gut models are being used to assess anti-inflammatory activity and impact on gut integrity.

SeaFibre – development of high-fibre food products with gut health benefits using innovative seaweed fibre ingredient

Project partners: Oceanium Ltd, University of Reading

Dietary fibre consumption supports overall health and normal function of the digestive system. Evidence shows adequate consumption can lower blood pressure and glucose levels, support gut bacteria, immune function and aid in weight management. Unfortunately, many UK adults fail to meet the daily recommended dosage of 30 grams per day, consuming instead only 15 to 20g due to fibre shortfalls within the typical Western diet.

Although atypical of the Western diet, seaweed is consumed in many parts of the world for its health-related benefits and nutritious properties such as its bioactive components and high fibre content. Fibre from brown seaweed, specifically fucoidan has been reported to modulate both pro and anti-inflammatory responses in animals and is currently approved for human consumption. Brown seaweed extracts may prove advantageous in increasing/ fortifying the fibre content of commonly consumed foods in the UK diet or lend prebiotic benefits to the host.

This study aimed to investigate the impact of Oceanium's seaweed fibre formulation 'Ocean Health Nutra', on human gut microbiota using an in-vitro three-stage continuous-flow colonic/gut model system that simulates the proximal, transverse and distal areas of the human colon.

METHODS

Gut models (n=3) inoculated with faecal material from one of three different donors were used to ferment the sea-fibre formulation. Samples taken were subjected to bacterial enumeration and identification by FISH-flow cytometry. Short-chain fatty-acids (SCFA) were quantified with gas chromatography (GC).



Feasibility study to determine the potential for a food fortification platform to provide population scale mitigation of heart disease risk

Project partners: Iona Therapeutics Ltd, Queen Mary University of London

Concept:
Hypertension treatment
for the whole population



Approximately 1 in 4 adults have high blood pressure and are at risk of developing heart disease. Even more concerning however is that high blood pressure is known as the 'silent killer', 5.5 million people in England alone have undiagnosed high blood pressure (hypertension) and are hence unaware that they face significantly increased risk of future serious ill health (heart attacks, strokes, heart failure, and kidney disease).

Challenge: how do we treat a public health risk in a population that is unaware of their personal health risk/condition?

Idea: use our diet to mitigate the health risk of the entire population.

Fortification product family



Via prior studies, the applicants have demonstrated the health benefits for regular consumption of inorganic nitrate to improve vascular function and reduce hypertension. These benefits are now widely recognised and foods containing naturally high levels of inorganic nitrate, such as beetroot, have gained prominence. However, encouraging the public to consume large quantities of beetroot-based foods has numerous technical, practical, economic and personal choice-related challenges.

Common foods



The objective of this project is to understand if a cheap and industrially convenient inorganic nitrate-based food fortification solution can be developed and added to commonly consumed foods (such as cereal and breads). This project has already demonstrated that nitrate-fortification of commodity foods is achievable, without adversely affecting food taste and appearance. Clinical testing (near-completion) of these products assessing whether these interventions effectively raise circulating nitrate levels a cohort of healthy volunteers to those associated with a physiologically significant impact on blood pressure and vascular function.

“ This project has enabled proof-of-principal for nitrate-fortification and connected us with industry partners who can help to realise our long-term goals. ”

Amrita Ahluwalia FMedSci, Iona Therapeutics Ltd

Population scale intervention

Please note: we have endeavoured to provide accurate information in this publication but cannot guarantee that it is free of errors.

Further information

You can access web pages for the Diet and Health Open Innovation Research Club and each Hub with the web addresses or by using the QR codes.



Diet and Health Open Innovation Research Club
oirc.org.uk/



Biofortification Hub
biofortificationhub.org/



Consumer Lab
consumer-lab.bristol.ac.uk/

i-NutriLife



i-NutriLife
i-nutrilife.org/

INFORM Hub



INFORM Hub
research.reading.ac.uk/inform-innovation-hub/



RIPEN Hub
ripenhub.co.uk/



STAR Hub
surrey.ac.uk/start-healthy-stay-healthy-star-hub



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