



Mid-term evaluation

Title of the programme: **FOOD FOR FUTURE**

Acronym of the programme: **F4F**

S4 priority area: **Sustainable Food Production**

Evaluator:

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1. Introduction

The review comprises an assessment of the progress made to date of the project funded under *S42 Priority Area: Sustainable Food Production* entitled '*Food for Future (F4F)*'. The programme targets the development of next generation foodstuffs, each addressing a key health/nutrition issue within food safety and human wellbeing.

The organisation of the review was planned excellently with summary presentations detailing progress against original targets and more crucially in terms of the assessment, the showcasing of unequivocal evidence of rapid progress through the TRL levels to the stage that actual foodstuffs are in the safety validation phase before penetrating the market.

The importance of this sector must never be underestimated and the investment in this Consortium is without doubt of the greatest value to the citizens of Slovenia. The Food and Agriculture Organisation (FAO) of the United Nations predicts that the global population will



grow to around 10 billion by 2050 and that consequently food production must increase by up to 70% to meet that need. The target has to be achieved in spite of the limited availability of natural resources such as arable lands, the increasing need for fresh water (agriculture consumes 70% of the world's fresh water supply) and other less predictable factors, such as the impact of climate change which leads to variations to seasonal events in the life cycle of plant and animals. Self-sufficiency in the provision of quality and safe food for citizens is an uncontested obligation for all sovereign Governments.

Consequently, innovation in food is evolving rapidly, a major strand of a global strategy to produce enhanced foods that target the nutrition and health from the same resources. The pressing need to secure food supplies ensures that the adoption of new generation of food will continue to gather pace. One of the major barriers to innovation in the sector is the entrenched practices inculcated within a highly traditional sector over many years.

F4F is an exemplar of the supply chain operating coherently from the research phase through to real products, meeting the prime objective of the funding to accelerate innovation through to higher TRL levels.

2. Assessment of Progress

2.1 General

The project has progressed excellently and has met and exceeded the Deliverables stated in the original submission. There is clear evidence of marked progression through the TRL levels and the spectrum of outputs is to be commended.

A number of key challenges are targeted on the open collaboration of scientist and commercial organisations. The route to market is the one of the most critical challenges of the project and there is undeniable evidence that each selected target foods has a robust impact route primarily as enhancement to an existing product portfolio.

The scope of the target outputs from the outset has been extensive and in the vast majority of similar activities normally creates issues of resource allocation as a consequence of pursuing multiple goals. In F4F, there has been neither tension nor dilution of each individual work stream through resolute development all of the targets stated in the original project. Thus the level of impact of the overall project is extremely high.

2.2 Key Highlights

A number of major Deliverables has been achieved to date. It is difficult to place a classification in order of impact as each is addressing a global market segmented by a specific nutrition or health objective. An uninformed classification is not of deep value as each of the new foodstuffs/additives has an established route to exploitation. The route to revenues is unambiguous as the market presence of the Consortium Companies in the sector is undoubted.



The validation phase for each new innovation – and hence movement up the TRL evolution – has been executed through the engagement of the appropriate consumer groups. One of the major strengths of the Consortium is that partners operate across the Supply Chain. Furthermore, cross-disciplinary projects often suffer from an initial phase of understanding the contribution from each grouping hindered by such factors as inculcated differences in cultures/behaviours and commercial practices. *The success of F4F is enabled by the respect shown for each partner's role within the project from the outset and that each stage of the supply chain is represented and has delivered on their tasks.*

Quality of taste/texture and safety are central to highly functional food innovation. The Consortium's ready access to consumers from the target market segments has not only been core to the developments but also from a commercial perspective, ensures these key requirements are met in so doing reducing the barriers to accelerated market adoption.

2.3 Changes to Workplan

In many multi-faceted, multi-institution projects such as F4F, the formulation of the original submission makes the most informed 'Case for Support' to secure the award. The major Work Packages are from necessity well-articulated but the detail of the execution although following a proposed viable methodology, lacks the highest granularity. This has not been the case for F4F as each partner has delivered on its stated contributions and the resources/facilities have been deployed in such a manner as to optimise the delivery of outputs. *The project has been managed excellently.*

2.4 Future Workplan

Given that the project is nearing the end of the funding period, the major outstanding activity is to validate the safety of the range of foods that have been developed. Notwithstanding taste/texture, the long term effects on the health/wellbeing of the consumer owing to the new foods must be validated before the ramp-up to significant sale. The side effects of any additives must be understood and guarantees be given on any negative impacts of the products. In this respect, there are legislative requirements to be met also.

The Consortium has demonstrated progress through the TRL levels for all of the development strands under consideration but some factors remain outstanding before the complete verification of attaining TRL 6.

3. Role of the Partners

The composition of the Consortium is excellent comprising both scientific expertise in food sciences; a proven methodology to define and design new foods; the 'prototyping', test and validation of the new products through the early engagement of consumers; translation to manufacturing; and established routes to commercialisation.

A significant advantage in effective development within complex projects is that Slovenia is a relatively small country with a strong sense of unity. This is highly relevant in many projects as the spectrum of disciplines and partner organisations originate from different cultures,



practices, terminologies and methodologies. F4F has demonstrated that a community that hitherto has not been collaborating extensively has taken this opportunity with openness and clarity of objectives.

Overcoming differences between partners can typically consume a significant period post-start and often detracts valuable time from attaining notable achievements before the end of the project. The F4F Consortium has debunked this characteristic of similar projects by deriving the maximum benefit from the funding through being respectful of all partners, their contributions and supporting each other to reach the overall goals of enhancing the ability of the Slovenian food supply chain to meet the modern needs of nourishing the local communities.

4. Internal

The Consortium has harnessed the relative strengths of the spectrum of industry and academic partners. The major drive for the project has, from the outset, originated from the industry groupings. The academic input was nevertheless of immense value in the selection of the strategies to reach the target food composition.

The project is a classic example of the translation of fundamental science through to consumer defined products. The early engagement of the target consumers has been central in this respect. The bulk of the developments was certainly not 'pushed by technology' and has followed the objective of the funding diligently. The packaging technology is a fundamental development and was rightly driven by the academic partners. The external communication of the project has been effective.

5. Dissemination and Exploitation

In a majority of similar developments publication, presentation and showcasing of the project outputs in advance of protecting the Intellectual Property (IP) that yields the competitive differentiator restrict the ability to gain rapid market traction and delays the time to initial sales. F4F has adopted a more direct route to mining the commercial benefits by focusing on creating the products 'quietly' and gaining market traction as quickly as possible.

There is a clear acceleration in the dissemination activities. The strong relationships with target consumer groups were critical in the development of the products but are also a spine in respect of the showcasing of project innovation and collaboration. The showcasing environment must be planned to ensure that not only are the products marketed but that a community hitherto not renowned for co-creating new products has been highly successful nevertheless, placing their duty of provisioning healthy and nutritious foodstuffs to its community paramount. Both these excellent achievements should be broadcast more widely through the press and television.



6. Scientific Achievements

The project has developed over 40 new innovations, will have delivered 20 new technological and organisational solutions and 15 groups on new products by the end of the project. Moreover, the funding has stimulated additional private investment in research and development as well as new capital investment in support of new product manufacture. The bulk of the developments are at the prototype stage moving to production in 2019 and 2020.

The scope and degree of scientific achievements is difficult to assess as the volume of research is large and continually changing globally. There have a notable number of publications; I would recommend that the highest impact journals should now be targeted since the maturity of the developments has increased and in turn the advances on the state-of-the-art. The quality of the publications also serves to corroborate the benchmarking of the project globally. The benchmarking should assess the level of innovation both in terms of the science but also in estimating the long term impact of the commercial offerings. It is acknowledged that the latter is a very difficult to achieve but the foundation established during F4F is ideal for the Consortium to secure further support in order to continue the innovation in the sector for many more years.

The recommendation is that the Consortium be supported in the future as the outputs generated during F4F demonstrate an ability to innovate and excellence in delivery.

6. Partner Co-operation

All partners have participated and contributed to project activities. The range of partners is excellent and the conclusion that all are co-operating is easy to draw based on listening to the presentations and viewing the project outputs.

The active engagement of the target consumers has been a key enabler to the success of F4F. This is a testament of the standing the main industry partners who operate globally and have established suppliers supporting manufacture and sales. The project has been championed by a number of very impressive industry leaders who through track records, have earned the right to make core decisions on the direction and execution of the project.

7. Conclusions and Recommendations

There is overwhelming evidence that supports the conclusion that F4F is a highly successful project that has delivered on the original goals and more importantly on the objectives of the funding. Despite the limited time to the end of the project, the Consortium are well aware of the final phase activities and priorities. I have no recommendations of note that will enhance what is already an excellent group delivering impactful outputs which bring benefit to the citizens of Slovenia.

Dissemination activities should now accelerate and extensive showcasing events should be planned utilising an extended range of broadcast channels. The benchmarking of the quality and excellence of the impacts is challenging in terms of social/wellbeing, economic and environmental.



The Lead Industry Company has been central to project success owing to an enviable track record of executing on product development and success in securing international market traction.

The role of the Ministry should also be highly commended. Two observations support the commendation;

- the forceful assertion was made 'that the Consortium would not have collaborated if the seed funding from the Ministry was not available'. *That assertion was made by the partners themselves.*
- until recently, the Ministry has not offered funding to the food sector. *The recent change in policy is not only enlightened as the sector is often neglected due to an entrenched – and mistaken – view that it does not innovate but also vindicated as the project is an exemplar on how to optimise co-creation between industry and academia to accelerate translation of innovation through the TRL levels.*