



Good IDEA – the algal value chain

The IDEA project is investigating the use of algae as a viable food, animal feed and care product ingredient.

You may unknowingly be familiar with *Spirulina* and *Chlorella*, two microalgal species that are often consumed today in smoothies and other health drinks. However, these microalgae are a rich protein source. Today, 70% of proteins in the European Union are imported. Clearly an alternative to this situation is needed. Due to their high growth rate and the small land area required, algae could become that alternative. However, we're not at that stage just yet. The challenge is to optimise the algae value chain, from local production to storage and handling, in such a way that it becomes a viable, economically relevant industry. That's the aim of the IDEA project, funded by the European Interreg North-West Europe programme, with partners in Belgium, the Netherlands, France, Germany and Ireland. In Ireland, Teagasc and Dr Maria Hayes and Caoimhe Gargan, both based at the research centre in Ashtown, Dublin, are leading the downstream processing and bio-refining work package.

Algae value chain

When we think of algae production, southern countries with warm climates spring to mind. However, northwest Europe is also suitable for commercial algae cultivation using in-house closed algal cultivation systems. IDEA focuses on the complete value chain of algae production.

At the moment, the various steps all exist separately, as there is not yet a full chain that can continually guarantee the supply of high-quality algae on an industrial scale. In concrete terms, IDEA will work on the cultivation and harvesting of different types of algae, all year round (Figure 1).

The project will also investigate how water can be reused to make cultivation more viable, in both ecological and economical terms. In addition, IDEA will look into the various possibilities for storage and transportation of algae. Finally, the bio-refining of the algae will be studied, to ensure that it reaches the end user in optimal workable condition. In the IDEA algae value chain, this end user is not the consumer in the shop, but the producer of algae-based care products, food or high-quality animal feed, to name a few examples. IDEA's partners come from a range of different backgrounds: academics, SMEs and scientists.

They will all bring their specific expertise to the project, in order to develop the algae value chain and take it to a higher level, because there is demand for it, not least from the professional field.

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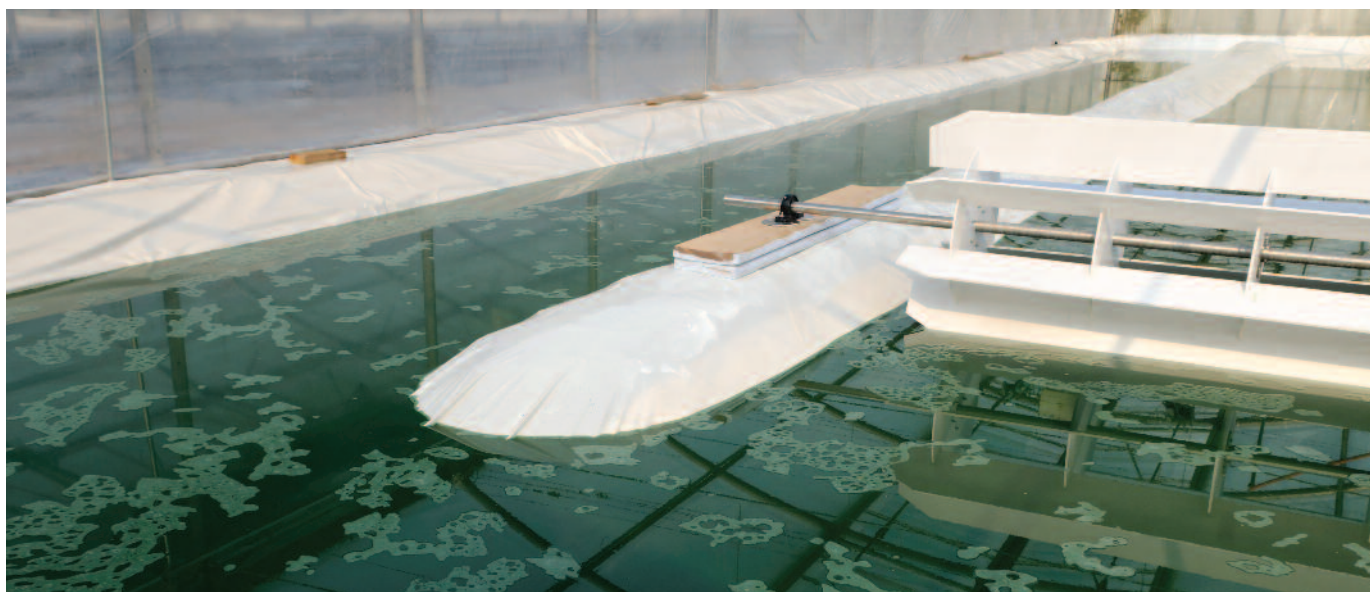


FIGURE 1: A Spirulina growth plant.

Multiple opportunities

Microalgae are rich in proteins and vitamins, and can be used to produce high-quality fish food for aquaculture, for example. The entire sector is still being developed and the IDEA project is extremely important for the dissemination of knowledge. Financiers want to have guarantees. This international grouping helps by enabling us to expand and reinforce our skills by means of collaboration. Partners include industries that are looking for algae for use as raw materials for cosmetics, food protein blends and pharmaceuticals. The role of Teagasc in the IDEA project is the characterisation of different compounds in microalgae supplied by partners in Germany, and the isolation, characterisation and application of algae-derived ingredients, including proteins,

peptides, lipids and carbohydrates in different food products. To date, Teagasc has looked at four different microalgae and carried out initial proximate analysis of these algae to determine which ones are suited for further characterisation work. **Figure 2** details the protein, ash and lipid content of algae supplied by IDEA research partners in Germany. It is hoped that IDEA will lead to the development of new and nutritional protein blends: food ingredients with added health benefits and new sources of animal and aquaculture feed that could help to reduce production costs on farms on both land and sea, and improve the overall health of the Irish and European populace.

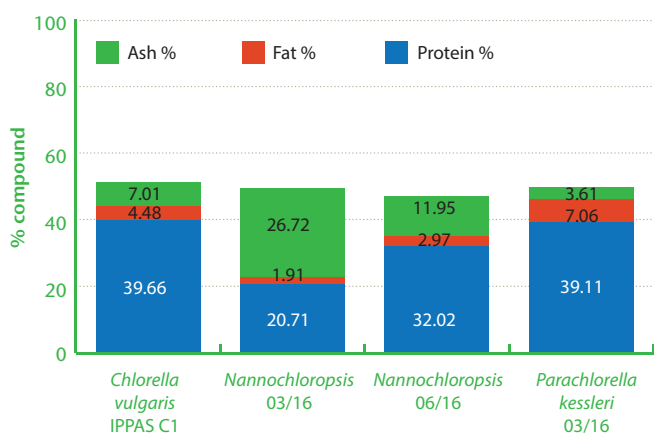


FIGURE 2: Proximate analysis including protein, ash and lipid content of microalgae analysed to date. Protein was measured using the AOAC method 968.06, 15th edition, Dumas method using LECO FP628; fats were measured using the total fats by acid hydrolysis filter bag technique, using Ankom hydrolysis and fat extraction; ash was measured using the furnace at 600°C.

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