



Coop Research Program | Call 4

New sustainable food formulations based on algae proteins

Background

Algae is a promising emerging protein source, as it contains up to 70 percent protein by dry mass, essential amino acids, and high amounts of micronutrients such as iron. For example, *Arthrospira* (commonly known as Spirulina) biomass is a beneficial protein source containing all essential amino acids. When compared to the proteins of meat, eggs, and milk, Spirulina contains less of some amino acids like methionine, cysteine and lysine; however, its amino acid profile is superior to typical plant protein, such as from legumes. Unfortunately, the exact composition of most algae protein is still largely unknown. Also, low efficiency along the value chain of algae products results in limited economic feasibility for this interesting biological protein source. Consequently, only limited algae based food products are available on the market.

Objective

The main objective of the project is to facilitate process innovation in the food industry focused on algae protein. This project will focus on process innovation along the algae value chain, leading to product development. Considering the enormous biodiversity of microalgae, this group of organisms represents one of the most promising sources for new products and applications.

Research Approach

This project will deliver technological insights on boosted cultivation and detailed characterization of functional and bulk proteins from algae. Utilization of innovative up- and downstream approaches will improve algal production

efficiency, which can help optimize economic feasibility and foster new food formulations. Innovative technologies such as pulsed electrical field, gentle extraction by natural solvents, micro process engineering, and tailor-made high moisture extrusion will be applied.

Relevance and Expected Outcomes

This project aims to enhance efficiencies of algae value chains via higher yielding production and new products. By improving production of a nutritious protein source, these activities support global food and nutrition security.

Food System Challenges Addressed

Sustainable production of healthy proteins, Innovative technologies for food product improvement, Effective food value chains.

www.worldfoodsystem.ethz.ch/research/research-programs/CRP

Principal Investigator Prof. Alexander Mathys,
Sustainable Food Processing

Co-Investigator Dr. Wolfgang Frey, KIT
Karlsruhe

Postdoctoral Researcher Dr. Martín Caporgno

Partners Swiss Food Research, German Institute
of Food Technologies, HighTech Europe Network,
Hilcona AG, Buhler AG, GNT Europa GmbH

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