Eawag
Überlandstrasse 133
8600 Dübendorf
Switzerland
Phone +41 (0)58 765 53 61
Fax +41 (0)58 765 53 75
info@eawag.ch
www.eawag.ch

Eawag Seminar Invitation

# Microalgae and Insects - Production Concepts Based on Sustainability Assessment Principles

Speaker ***Prof. Alexander Mathys,***
*Institute of Food, Nutrition and Health IFNH, ETH Zurich, Switzerland*

When **November 3, 11.00 – 12.00 a.m.**

Where **Forum Chriesbach, room C20, Eawag Dübendorf**

Abstract Sustainable food processing as key driver of the bioeconomy covers process-product-operation interactions, where selected examples of innovative production processes aligned with sustainability assessment principles will be introduced.

Advanced approaches relying on innovative raw materials from algae or insects and their connected zero waste biorefinery concepts could innovate our global food system. Such innovative value chains could be linked to novel opportunities to value alternative protein sources. By using novel proteins from algae and insects, food security and sustainability of the protein supplies can be significantly improved. If compared with other promising alternative proteins, the main benefit in terms of improved food production sustainability is cultivation on non-arable land without competition to other crops in the food value chains. Modular thermal micro process engineering was effectively applied to investigate functional algae protein thermostability and upscaling of microbial inactivation processes. Electro-magnetic based pulsed electrical field processing enables an efficient use of biomass and energy within several value chains. Membrane permeabilisation based on pulsed electric fields PEF could generate cell stress and at higher energy inputs a gentle disintegration for the release of heat sensitive ingredients such as functional proteins. Field-driven aqueous pore formation in the phospholipid bilayer is suggested to be the major mechanism during the electric pulse.

Holistic life cycle sustainability assessment, aligned with the introduced process innovations, can evaluate the suggested solutions on a multi parameter base, in terms of improved food production sustainability. Current industry data of the insect value chain could be integrated into a detailed environmental life cycle assessment and demonstrated the potential as well as hot spots of insect based food and feed applications.