



## Innovative algae and insect processing presentation



Alexander Mathys, Assistant Professor of Sustainable Food Processing Laboratory, ETH Zurich, Switzerland will be addressing Congress delegates on *Innovative algae and insect processing to target a more sustainable food supply*.

The concept of the bioeconomy covers the agricultural economy and all manufacturing sectors and associated service areas that develop, produce, process, handle or utilise any form of biological resources, such as plants, animals and microorganisms. There are five priority fields of action for further development: global food security, sustainable agricultural production, healthy and safe foods, the industrial application of renewable resources and the development of biomass-based energy carriers.

Sustainable food processing as key driver of the bioeconomy covers process-product-operation interactions, where selected examples of innovative thermal, electro-magnetic, mechanical and combined processes will be introduced.

Advanced approaches relying on innovative raw materials from algae or insects and their connected biorefinery concepts could even increase the impact of sustainable food processing. 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.

Modular thermal micro process engineering was effectively applied to investigate functional algae protein inactivation 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 permeabilization, 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.

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.

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