UpWaste

SUSTAINABLE UP-CYCLING OF AGRICULTURAL RESIDUES: MODULAR CASCADING WASTE CONVERSION SYSTEM

3° Call:	2019
Project period:	01/04/2020 – 31/03/2023
Topic:	Sustainable intensification of food and non-food biomass production and transformation systems, including biorefinery concepts
Keywords:	Insects, microalgae, food waste, LCA, modular technology
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Total funding:	1.354.000 €
Website:	Faccesurplus.org

FACCE SURPLUS
SUSTAINABLE AND RESILIENT AGRICULTURE FOR FOOD AND NON-FOOD SYSTEMS

UpWaste

BACKGROUND

The UpWaste project tackles the interconnected challenges of agriculture as well as the sustainable intensification of the agricultural sector, efficient use of resources and lower GHG emissions by developing a flexible and modular system for the conversion of agricultural residues into heterotrophic microalgal (Galdieria sulphuraria) and insect (Hermetia illucens) biomass.

OBJECTIVE

The objective is to create an industrial blueprint of the UpWaste modular biorefinery system application. Such a system will create new market opportunities and determine the feasibility of new products and services generated through integrated food and non-food systems.

METHODOLOGY

UpWaste relies on metabolic modelling with experimental calibration at lab and pilot industrial scales.

The UpWaste system, based on selected species, converts residues, which are diverse and difficult to characterize (e.g. manure, food waste, straw, and hull), into high-quality biomass with defined composition. Following cascading principles, produced biomass will serve as a substrate for the development of various products ranging from food to chemicals by relevant industries (creation of innovation potential for the associated industrial stakeholders). Focus is further on detection and avoidance of biological contaminations for assuring the safety of produced biomass and even identifying the potential for the application as food and feed.

Socio-economic and environmental impact analyses of supply chains will be performed to assess social acceptance, economic and environmental feasibility of the envisaged system.

Holistic sustainability assessment of UpWaste integration in existing agri-food chains (agricultural and food waste and side-streams treatment) will indicate trade-offs not only between different sectors (e.g. agri-food and energy) but also between different aspects of sustainability (e.g. production and environment).

Furthermore, UpWaste will define potential risks of rebound effects associated with the application of UpWaste modular system, when the application of side-streams or wastes for new product generation may result in higher production rates of such wastes .