

NATIONAL
DEVELOPMENT
PLAN 2020



EUROPEAN UNION

European Regional
Development Fund

I N V E S T I N G I N Y O U R F U T U R E

Project title: Sustainable Microbial Valorisation of Waste Lipids into Biosurfactants (Waste2Surf)

Project No. 1.1.1.1/19/A/047

Project leading partner: University of Latvia

Project partners: JSC "Biotehniskais Centrs"

Project report on the tasks completed in the period from 01.10.2020. till 31.12.2020.

During the reporting period, the implementation of the project was started with an in-depth analysis of the scientific literature on the use of yeasts for the production of bio-surfactants from primary and used cooking oils and fats. Based on the literature analysis, five yeast strains have been selected for the production of bio-surfactants and work has begun on characterizing their genotypes. In parallel, work has begun on the development of genome-scale stoichiometric models – a set of genome-scale stoichiometric models has been identified for organisms that produce sophorolipids and mannosileritritollipids. Some of the biochemical pathways producing the target products have been identified or implemented in the models. Work has begun on the development of a laboratory experimental methodology for the determination of biosurfactants, as well as several experiments for the extraction of biosurfactants from waste oils and fats. Two standard methods for the total activity of bio-surfactants (CTAB, oil displacement method) have been introduced. The methods have been tested on both, reference substances and extracts obtained from oil fermentations by yeast.

During the reporting period, the development of specifications for the necessary materials and auxiliary equipment for the fermentation of biosurfactants was started, as well as the identification of critical process parameters and relevant measurement principles and the list of key process model parameters on which the mathematical model development will be based. The first attempt of the fermentation process in a laboratory bioreactor with a strain of *S. bombicola* was also carried out.

During the reporting period, a team of researchers began work on a review article on the use of yeasts for the production of biosurfactants from edible oils and fats and an assessment of the environmental impact of the production process. A number of communication activities were carried out, as well as three project team meetings to discuss the overall progress of the project, the risks that may hinder the achievement of the project results, and actions to mitigate these risks.

Information about the project at the partner's website:

<https://www.bioreactors.net/wastetosurf>

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05.01.2021.