

# WASTEWATER REMEDIATION FROM OLIVE OIL MILL USING MICROALGAE: A TECHNO-ECONOMIC ANALYSIS OF AN INDOOR TUBULAR PHOTOBIOREACTOR FOR FOOD GRADE PRODUCT

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## Abstract:

Microalgae cultivation is a very ancient activity. Nevertheless, especially in recent years, this activity has achieved attention due to the great variety of products that can be obtained (feed, food, biofuels, etc.) and offer an alternative for the treatment of wastewater (urban, industrial or agricultural effluents) (Christenson and Sims, 2011).

Wastewater by olive oil mills is offering to microalgae several opportunities to boost its competitiveness and growth across the Europe, thanks to the scale up and further commercialisation of a new eco-innovative process. The amount of olive wastewater generated represents a key environmental problem in Europe, with particular focus in Mediterranean areas and due to considerable concentrations of phenols, lipids and organic acids, it is also highly phytotoxic (Hodaifa et al., 2013). Traditional olive oil processing methods are estimated to produce between 400 and 1000 liters of wastewater for each tonne of processed olives. The pollution of 1 m<sup>3</sup> of wastewater has been estimated to be equivalent to 200 m<sup>3</sup> of urban sewage. However, these residues, contain valuable resources, that can be used as nutrients for microalgae production.

The aim of this work is to evaluate the techno-economic feasibility of microalgae cultivation using olive oil mill wastewater, ensuring that microalgae biomass can then be used on food industry. For this reason the production plant is divided into two, one to pretreat the wastewater and an indoor horizontal tubular photobioreactor for microalgae production.

## Keywords:

Wastewater, olive oil mill, microalgae

## References:

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