



“Gheorghe Asachi” Technical University of Iasi, Romania



BIOTECHNOLOGICAL PROCESS FOR THE VALORISATION OF RESIDUAL GLYCEROL FROM THE BIODIESEL INDUSTRY. BROADENING THE BIOREFINERY

Xavier Turon, Sergi Abad, Francesc Padrès

IQS-Institut Químic de Sarrià, Ramon Llull University, via Augusta 390, Barcelona, Spain

Abstract

Crude glycerol is generated in large excess by the biodiesel industry. About 10% of the feedstock is collected as contaminated byproduct, crude glycerol as an output. Purification tends to be economically unviable due to its cost and to the excess of glycerol in the market. In 2009-10 an increase of 233% was achieved in the UE.

Bioprocesses using microorganisms able to metabolize the contaminated glycerol and generating valuable metabolites are explored. In this case, a marine heterotrophic microalgae or protist showed interesting yields using pure glycerol, producing very long chain poly unsaturated fatty acids (PUFA). The current work allows the characterization of the life cycle of this protist in benchtop fermenters, as potential industrial microorganisms. In terms of the metabolite of interest, docosahexaenoic acid (DHA) an omega-3 fatty acid is our main goal. But other valuable chemicals can be obtained as well (i.e: other fatty acids as the eicosapentaenoic (EPA) or arachidonic, and complex molecules as squalene). Currently the primary source is of DHA is fish-oil, carrying bioaccumulated persistent organic pollutants (POP). The current project is willing to contribute to alleviate an industrial/environmental problem and a human food/health problem, applying a biotechnology process.

The added value of such molecules might substantially contribute to the economic viability of a biodiesel biorefinery, broadening the platform as includes chemicals to the liquid fuels obtained. Such large biorefinery platform might enable the economic viability of the biodiesel without any public subsidies.
