

Operational Stability of *Thermomyces lanuginosa* and *Rhizomucor miehei* Lipase during Interesterification of a Blend of Palm Stearin, Palm Kernel and Olive Oil in Continuous Packed-bed Reactors

Fabiana Andreia Schafer De Martini Soares¹, Roberta Claro da Silva¹, Jessica Mayumi Maruyama¹, Natália de Melo Osório^{2,3}, Luiz Antonio Gioielli¹, Suzana Ferreira-Dias⁴.

¹ Department of Biochemical and Pharmaceutical Technology, FCF/USP, São Paulo, Brazil

² Instituto Piaget, ISEIT de Almada, Portugal

³ Instituto Superior de Agronomia, CEER-Biosystems Engineering, Technical University of Lisbon, Lisbon, Portugal

The operational stability of commercial immobilized lipase from *Thermomyces lanuginosa* ("Lipozyme TL IM") and *Rhizomucor miehei* ("Lipozyme RM IM") during the interesterification of a blend of palm stearin, palm kernel oil and olive oil (45:30:25, wt %) in a continuous packed-bed reactor, was investigated. The aim of this study was to evaluate the operational stability of an immobilized form of these biocatalysts during the interesterification of fat blends, at 65 °C, carried out continuously. The bioreactors operated continuously at 65 °C, for 240h, at a residence time of 7 min. Biocatalyst activity was evaluated in terms of the decrease of the solid fat content at 35 °C of the blends, which is a key parameter in margarine manufacture. The inactivation profile of the biocatalyst could be well described by the first-order deactivation model: half-lives of 88 h and 50 h were estimated when *Thermomyces lanuginosa* and *Rhizomucor miehei* lipases, respectively, were used. The free fatty acid content of the interesterified blends decreased from 5 % to about 2% during the first day of operation, remaining constant thereafter.

Financing: FAPESP, CAPES, CNPq.