

ASSESSING THE INFLUENCE OF BEHENIC ACID CONCENTRATION ON THE PHYSICOCHEMICAL PROPERTIES OF STRUCTURED LIPIDS PRODUCED BY ENZYMATIC INTERESTERIFICATION

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The need for effective dietary approaches that act in a non-aggressive way to control obesity has encouraged the production of structured lipids (SLs) that are restructured triacylglycerols obtained by chemical and/or enzymatic interesterification or transesterification. Enzymatic interesterification reaction is advantageous since it allows a great control over the positional distribution of fatty acids in the glycerol backbone. Behenic acid, obtained by the hydrogenation of crambe oil, is a long chain saturated fatty acid widely used as a substrate in the production of these SLs, as it reduces lipid absorption. Peanut and soybean oil are composed of essential fatty acids and present more than 80% of mono- and polyunsaturated fatty acids. Thus, this work aimed at producing structured lipids from varying ratios of peanut oil (P), soybean oil (S), and fully hydrogenated crambe oil – FHCO (C) mixtures by enzymatic interesterification (Lipozyme TL IM) and to evaluate their physicochemical properties. The mixtures ratio varied in order to have samples with 6, 18 and 24 % (m/m) of behenic acid. Interesterification caused an increase in crystallization time and a decrease in the solid fat content for all mixtures. The redistribution of the fatty acids in the glycerol backbone changed the thermal behavior, leading to a decrease in the onset and end temperatures during crystallization, which indicates that new triacylglycerols were formed. As for the classes of acylglycerols, the amount of triacylglycerols was higher than the content of diacylglycerols and monoacylglycerols, inferring that the hydrolysis followed by esterification left a small amount of diacylglycerols and monoacylglycerols. Regarding samples consistency, the higher concentration of behenic acid favored to obtain samples with greater hardness. As conclusion, structured lipids containing different behenic acid concentrations were produced by enzymatic interesterification in order to obtain lipids with antiobesity potential and varied functionalities of technological application.