Enzymatic structuring of Triacylglycerols of fat mixtures, containing Medium- and Long-chain Polyenic Fatty Acids from n-3 family, with the application of Non-specific Action Biocatalyst

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Enzymatic structuring of triacylglycerols (TAG) of mixed fats (vegetal and marine) creates the possibilities of obtaining food ingredients for manufacture of health-promoting products and increase of nutritional values of conventional foods. The studies of functional foods, suitable in control of civilization diseases are conducted all over the world. Such foods may be obtained by enrichment of conventional foods in various bioactive components with the effect, favourable for human health, i.e. polyenic fatty acids. These studies on the enzymatic restructuring process, employing the interesterification of the fat mixtures, containing fatty acids of n-3 (omega-3) group (tri-, tetra-, penta- and hexaenoic acids) with a differentiated chain length and degree of saturation were carried out. The experiment was conducted in a model system, on a laboratory scale. The enzyme from *Candida Antarctica* and *Aspergillus Oryzae* not revealing any specificity to the particular positions of triacylglycerol (TAG) was used as a biocatalyst. The research material consisted of rapeseed oil and fish oil mixtures witch had different levels of EPA and DHA acids. The enzymatic processes of interesterification were conducted in a batch system with a stirrer, nitrogen and without solvent. The optimal parameters of the process were determined and the analysis of the obtained product was carried out. Determination of fatty acids composition in TAGs and next in sn-2 position of TAG enabled on percentage participation each KT. Fatty acids composition in sn-2 position of TAG and sn-1,3 positions of TAG was changed, which confirmed reaction inversion. In the case of linolenic acid reduced the final quantity of linolenic acid to 40% in internal position of TAG. In the case of EPA and DHA in the internal position of TAG, the quantity increased to approximately 50% and 23% respectively. In the internal position of TAG the opposite result was observed. The oxidative stabilization obtained product was higher than raw material before reaction. The finally product consist of mainly TAG (90%), DAG and MAG after removing free fatty acids from mixture.