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題名 ; An Efficient Production of MLCT Oil by Lipase Reaction

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Lipase catalyzed inter-esterification is an excellent method to make a functional structure lipid. It can be conducted at normal temperature and pressure, so deterioration of reactants can be reduced and side reaction can be controlled. Moreover, characteristic structure lipids can be created by lipase's position specificity of esterification. Examples of practical application include cacao butter equivalent for the purpose of improving physical properties and medium and long chain triacylglycerol (MLCT) for nutritional improvement. However, the inter-esterification reaction using lipase has been practically used only in part. One of the major reasons is the cost. Maintaining stability during prolonged reaction is a major subject, as lowering enzyme stability directly leads to increase in cost. However, enzymatic reactions are delicate, so there are hurdles to fix the proper reaction system and conditions. In these issues, we examined from two points, with a view to manufacturing MLCT. The first plan is to increase the activity of the enzyme itself. We succeeded in enhancing its activity by certain pretreatment to the enzyme. Secondly, by optimizing the reaction system, we were able to suppress the decreasing enzyme stability. We established continuous reaction system by examination of various reaction conditions. We also clarified that the enzyme stability is maintained by pretreating the reaction substrate. From the above studies, we were able to enhance the activity of the enzyme and we achieved the design of the system for stable production. As a result, we have been able to manufacture a high quality MLCT with low cost.