110th AOCS Annual Meeting & Expo　発表

題名；Efficient Production of MLCT Oils by Lipase Reactions

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Lipase catalyzed inter-esterification is an excellent method to make functional structure lipids. 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. Since a decrease in lipase stability leads to an increase in cost, maintaining stability during prolonged reaction is a major subject. However, enzymatic reactions are delicate, so there are hurdles to fix the proper reaction system. In these issues, we examined from two points, with a view to manufacturing MLCT oils. At first, we searched lipases suitable for production. We compared reactivity of lipases from commercialized to original ones, and we identified stable lipases. Secondly, we tried to suppress the decreasing lipase stability by optimization of reaction system. Specifically, we adjusted reaction conditions and reaction mode (batch or continuous) thereby establishing a stable reaction system. We also clarified that lipase stability is maintained by pretreating the reaction substrate. From the above studies, we were able to enhance the lipase activity and achieve the design of stable production system. As a result, we have been able to manufacture a high quality MLCT oils with low cost.