

**Production of soft-PMF and Superolein:
Influence of Diacylglycerols on Dry Fractionation Process Efficiency**

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A recent study on the role of diacylglycerols (DAG) in palm olein fractionation is presented. Since DAG form the principal 'minor-components' group present in crude and refined palm olein, their impact on the crystallization is known to be substantial: e.g. inhibition/promotion of nucleation, retardation of crystal growth, formation of eutectics. Previous research and industrial experience show that such effects can be significant during dry fractionation. However, these studies often focus on end product qualities in relation to DAG content, rather than on when and how DAG have an impact. In order to study the effects of DAG and their relative importance during the crystallization stage of the dry fractionation process, refined palm olein was prepared with 5 different DAG concentrations ranging from 1% to 11%, by first removing and then adding the DAG to the purified palm olein. In a first approach, the static crystallization behavior of the blends at fractionation temperatures (14 -17°C) was studied with DSC, p-NMR and PLM to quantify the influence of DAG content on the growth rate and crystal morphology. Secondly, the effects of the DAG on the process characteristics in different cooling conditions were followed (by rheology, PLM, p-NMR, DSC and HPLC) in a lab-scale crystallizer. Finally, complete cooling curves and membrane press filtrations were performed on selected DAG concentrations, resulting in various soft-PMF and superolein qualities. This approach allowed verifying the impact of different DAG contents on both crystallization and filtration stages of the dry fractionation process.