

# Physical Characterization of Lard Partial Acylglycerols and their Effect on Melting and Crystallization Properties of Blends of Lard with Rapeseed Oil

Lingzhi Cheong<sup>1</sup>, Hong Zhang<sup>1</sup>, Yuan Xu<sup>2</sup>, Xuebing Xu<sup>1</sup>

<sup>1</sup>Department of Molecular Biology, Aarhus University, DK-8000 Aarhus C, Denmark

<sup>2</sup>National Food Institute, Technical University of Denmark, DK-2800 Lyngby, Denmark

Higher nutritional value of diacylglycerol (DAG) attracted the possibility of its incorporation in food applications. To date, most studies done focused on DAG from plant oil sources. This work attempted to produce partial acylglycerols from animal-based fat namely lard and to study its effects on melting and crystallization properties of blends of lard with rapeseed oil (LR) for future applications in meat products. Partial acylglycerols [lard-monoacylglycerols (lard-MAG) and lard-DAG] were found to result in different melting and crystallization properties of LR. Lard-MAG exerted slight inhibitory effect on crystallization of LR. Nevertheless, it was not statistically significant ( $P > 0.05$ ). In fact, presence of lard-MAG did not change the solid fat content (SFC) of LR. Lard-DAG; on the other hand, exerted different effects on crystallization of LR depending on its concentration and degree of supercooling. Presence of low concentration of lard-DAG was found to significantly ( $P < 0.05$ ) delayed nucleation and crystal growth velocity of LR at low degree of supercooling which was reflected in reduced Avrami constant ( $k$ ), SFC and increased half time of crystallization ( $t_{1/2}$ ). Meanwhile, with increased  $k$ , SFC and decreased  $t_{1/2}$ , high concentration of lard-DAG was found to promote nucleation and crystal growth in LR at low degrees of supercooling. The characteristics of the blends may have correlations with their properties in potential meat applications.