

Physicochemical properties and crystallisation behaviour of bakery shortening produced from stearin fraction of palm-based diacylglycerol blended with various vegetable oils

ABSTRACT

The stearin fraction of palm-based diacylglycerol (PDAGS) was produced from dry fractionation of palm-based diacylglycerol (PDAG). Bakery shortening blends were produced by mixing PDAGS with either palm mid fraction, PMF (PDAGS/PMF), palm olein, POL (PDAGS/POL) or sunflower oil, SFO (PDAGS/SFO) at PDAGS molar fraction of $X_{PDAGS} = 0.4\%, 0.5\%, 0.6\%, 0.7\%, 0.8\%, 0.9\%$. The physicochemical results obtained indicated that C16:0 and C18:1 were the dominant fatty acids for PDAGS/PMF and PDAGS/POL, while C18:1 and C18:2 were dominant in the PDAGS/SFO mixtures. SMP and SFC of the PDAGS were reduced with the addition of PMF, POL and SFO. Binary mixtures of PDAGS/PMF had better structural compatibility and full miscibility with each other. PDAGS/PMF and PDAGS/SFO crystallised in β' polymorphs in the presence of 0.4-0.5% PDAGS while PDAGS/POL resulted in β polymorphs crystal. The results gave indication that PDAGS: PMF at 50%:50% and 60%:40% (w/w) were the most suitable fat blend to be used as bakery shortening.

Keyword: Diacylglycerol fractions; Shortening; Stearin; Palm