

Effect of enzymatic transesterification with flaxseed oil on the high-melting glycerides of palm stearin and palm olein

ABSTRACT

The effects of enzymatic transesterification on the melting behavior of palm stearin and palm olein, each blended separately with flaxseed oil in the ratio of 90:10 and catalyzed by various types of lipases, were studied. The commercial lipases used were Lipozyme IM, Novozyme 435, and myceliumbound lipases of *Aspergillus flavus* and *A. oryzae*. The slip melting point (SMP) of the palm stearin/flaxseed oil (PS/FS) mixture transesterified with lipases decreased, with the highest drop noted for the mixture transesterified with Lipozyme IM. However, when palm stearin was replaced with palm olein, the SMP of the palm olein/flaxseed oil (PO/FS) mixture increased, with the commercial lipases causing an increase of 41 to 48% compared to the nontransesterified material. As expected, the solid fat content (SFC) of the transesterified PS/FS was lower at all temperatures than that of the nontransesterified PS/FS sample. In contrast, all transesterified PO/FS increased in SFC, particularly at 10°C. Results from DSC and HPLC analyses showed that the high-melting glycerides, especially the tripalmitin of palm stearin, were hydrolyzed. Consequently, 1,3-dipalmitoylglycerol was found to accumulate in the mixture. There was no difference in the FA compositions between the transesterified and nontransesterified mixtures.

Keyword: DSC analysis; High-melting glyceride; Palm olein; Palm stearin; Slip melting points; Solid fat content