

## Physical properties of *Pseudomonas* and *Rhizomucor miehei* lipase-catalyzed transesterified blends of palm stearin:palm kernel olein

### ABSTRACT

The physical properties of *Pseudomonas* and *Rhizomucor miehei* lipase-catalyzed transesterified blends of palm stearin:palm kernel olein (PS:PKO), ranging from 40% palm stearin to 80% palm stearin in 10% increments, were analyzed for their slip melting points (SMP), solid fat content (SFC), melting thermograms, and polymorphic forms. The *Pseudomonas* lipase caused a greater decrease in SMP (15°C) in the PS:PKO (40:60) blend than the *R. miehei* lipase (10.5°C). Generally, all transesterified blends had lower SMP than their unreacted blends. *Pseudomonas* lipase-catalyzed blends at 40:60 and 50:50 ratio also showed complete melting at 37°C and 40°C, respectively, whereas for the *R. miehei* lipase-catalyzed 40:60 blend, a residual SFC of 3.9% was observed at 40°C. Randomization of fatty acids by *Pseudomonas* lipase also led to a greater decrease in SFC than the rearrangement of fatty acids by *R. miehei* lipase. Differential scanning calorimetry results confirmed this observation. *Pseudomonas* lipase also successfully changed the polymorphic forms of the unreacted blends from a predominantly  $\beta'$  form to that of an exclusively  $\beta$  form. Both  $\beta$  and  $\beta'$  forms existed in the *R. miehei* lipase-catalyzed reaction blends, with  $\beta$  being the dominant form.

**Keyword:** DSC; Lipase; Palm kernel olein; Palm stearin; Polymorphic forms; *Pseudomonas*; *Rhizomucor miehei*; Slip melting points; Solid fat content; Table margarines; Transesterification