

Enzymatic Interesterification of High Oleic Oil with Lauric Fat Blends for Shortening

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Shortening base stock was prepared by blending High Oleic Sunflower Oil/HOSO, Palm Kernel Oil and a hard fat (hard Palm Stearin or Fully Hydrogenated Rapeseed Oil). The ternary blends were adjusted for having the same unsaturated/saturated fatty acid ratios. Physicochemical properties of the fat blend were then compared with those of its interesterified blend. Enzymatic interesterification was carried out using sn-1,3 specific lipase on its optimum condition.

Silver-ion HPLC analysis showed that there was an increment on the degree of unsaturation based on the TAG composition after interesterification. As a result, the process significantly altered fat blend properties, namely solid fat content/SFC, crystallization and melting behaviors, and crystal morphology. Interesterification by including HOSO gave the lowest SFC profile whilst its slope was the sharpest. The slopes of SFC profiles of interesterified blends without HOSO were found to be comparable to that of commercial shortening. Crystallization peaks of the fat blends were also changed after interesterification. The peak at higher temperature was diminished, and as replacement, a broad peak at middle temperature was emerged for both interesterified blends with HOSO and without HOSO. The enzymatic interesterification reduced the melting temperature of the fat blends. However, the interesterified blends with HOSO gave lower melting temperatures than those of the interesterified blends without HOSO. It was also observed from PLM that the size of fat crystals became smaller and dispersed more homogeneously after enzymatic interesterification.