

Physical Blending of Fractionated Bambang Kernel Fat Stearin and Palm Oil Mid-Fraction to Formulate Cocoa Butter Equivalent

ABSTRACT

In this study, the physicochemical properties, composition, thermal properties, and crystal microstructure of fractionated bambangan kernel fat stearin and palm oil mid-fraction blends were investigated with respect to a potential cocoa butter equivalent. The blends were prepared in five ratios, and all of the blends exhibited similar physicochemical properties to cocoa butter. Although all of the blends had similar physicochemical properties, the blend containing 70% bambangan kernel fat stearin and 30% palm oil mid-fraction showed remarkable similarity to cocoa butter. The blend had similar fatty acid and triacylglycerol content to cocoa butter with 18.74% palmitic acids, 38.26% stearic acids, 34.05% oleic acids, 15.20% 1,3-dipalmitoyl-2-oleoyl glycerol, and 29.74% 1,3-distearoyl-2-oleoyl glycerol with improved thermostability (high solid fat content at 30 °C but reaching 0% at 40 °C). It also exhibited spherulite crystals with a needle-like crystal structure of 50 µm. This mixture showed good compatibility with cocoa butter at all mixing ratios; hence, it is suggested as a potential cocoa butter equivalent.