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Physicochemical and Rheological Properties of Butter Made from Supercritically Fractionated Milk Fat

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A milk fat fraction enriched with high melting triglyceride was extracted by using a continuous, pilot-scale supercritical CO_2 system and recombined into butter. Compared with market butter, the high melting butter had higher contents of unsaturated long-chain fatty acids, high melting triglycerides, and -carotene; higher intensity of yellow color; and lower cholesterol content. At similar temperatures, the high melting butter exhibited higher solid fat contents, complex viscosities, and power law consistency indices for viscoelastic parameters, indicating that its behavior is more like that of solids. The viscoelastic properties of high melting butter at 32 °C were comparable with those of market butter at 22 °C. The high melting triglyceride butter revealed higher emulsion stability without oiling off at 34 °C. Because of its stable behavior at high temperatures, the product also offers good potential for application in bakery, chocolate, and confectionery industries in which stability of fat is a desired characteristic. Water activities were lower for high melting triglyceride butter than for market butter at similar temperatures, which should enhance microbial stability as well. Lower cholesterol and saturated fatty acid contents should also make high melting butter more attractive to consumers.

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