

## Characterization of ternary blends of vegetable oils with optimal $\omega$ -6/ $\omega$ -3 fatty acid ratios

An optimal ratio of omega-6 to omega-3 ( $\omega$ -6/ $\omega$ -3) polyunsaturated fatty acids (PUFA) in the diet prevents the pathogenesis of many inflammatory diseases. This study aimed to synthesize and characterize ternary oil blends with optimal  $\omega$ -6/ $\omega$ -3 ratios using olive (OL), sunflower (SU), and cress (CR) oils. The oxidative stability, thermal profile, fatty acid (FA) and tocopherol compositions, and the physicochemical properties of the blends were used to determine their quality. Oil mixtures were prepared with 2, 3, 4, and 5  $\omega$ -6/ $\omega$ -3 ratios. FA composition and tocopherol content were the most important factors affecting the oxidation and thermal stabilities of the oils. All oil mixtures showed good quality indices. Thus, synthesized oil blends with high oxidative stability, high antioxidant content, optimal  $\omega$ -6/ $\omega$ -3 ratios, and recommended FA compositions can influence human health. The composition of healthy oil blends with optimal  $\omega$ -6/ $\omega$ -3 ratios was expressed mathematically and depicted graphically in a ternary diagram.

**Keyword:** Oxidative stability; Ternary diagram; Ternary oil blends; Tocopherols;  $\omega$ -6/ $\omega$ -3 fatty acid ratio