

COMBINED EFFECT OF THERMAL AND NON-THERMAL PROCESSING TECHNOLOGIES IN ENHANCING THE LYCOPENE *IN VITRO* BIOACCESSIBILITY OF TOMATO JUICE

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Low lycopene bioaccessibility/bioavailability is an identified worldwide issue; therefore there is a focused interest in ways of increasing the uptake of lycopene from the human diet. This study was conducted to test the lycopene bioaccessibility using different thermal and non-thermal processing technologies. The influence of moderate intensity pulsed electric field (MIPEF) processing on enhancement of the lycopene bioaccessibility of whole tomato fruit, and the combined effect of thermal blanching, ultrasonic (US) and high intensity pulsed electric field (HIPEF) processing on further enhancement of the lycopene *in vitro* bioaccessibility of tomato juice, were investigated. The maximum total lycopene bioaccessibility content (9.6%) of whole tomato was achieved by a 4 μ s (at 1 kV/cm) treatment after a 24 h holding period. The results of juice processing revealed that all treatments enhanced the total lycopene content. Tomato juice subjected to blanching alone and blanching followed by US and TP treatments decreased the release of total lycopene content from tomato matrix during digestion, while blanching followed by HIPEF treatment showed significant impact achieving five times higher total lycopene bioaccessibility (15.60%) compared to the thermally processed juice (4.95%).

Keywords: *Lycopene, Bioaccessibility, Pulsed electric field*