

## Microfluidized Fiber Based Oleogels for Encapsulation of Lycopene

**Authors :** Behic Mert

**Abstract :** This study reports a facile approach to structure soft solids from microfluidizer lycopene-rich plant based structure and oil. First carotenoid-rich plant material (pumpkin was used in this study) processed with high-pressure microfluidizer to release lycopene molecules, then an emulsion was formed by mixing processed plant material and oil. While, in emulsion state lipid soluble carotenoid molecules were allowed to dissolve in the oil phase, the fiber material of plant material provided the network which was required for emulsion stabilization. Additional hydrocolloids (gelatin, xhantan, and pectin) up to 0.5% were also used to reinforce the emulsion stability and their impact on final product properties were evaluated via rheological, textural and oxidation studies. Finally, water was removed from emulsion phase by drying in a tray dryer at 40°C for 36 hours, and subsequent shearing resulted in soft solid (ole gel) structures. The microstructure of these systems was revealed by cryo-scanning electron microscopy. Effect of hydrocolloids on total lycopene and surface lycopene contents were also evaluated. The surface lycopene was lowest in gelatin containing oleo gels and highest in pectin-containing oleo gels. This study outlines the novel emulsion-based structuring method that can be used to encapsulate lycopene without the need of separate extraction of them.

**Keywords :** lycopene, encapsulation, fiber, oleo gel

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