



XVIIth World Congress of the International Commission of Agricultural and Biosystems Engineering (CIGR)

Hosted by the Canadian Society for Bioengineering (CSBE/SCGAB)
Québec City, Canada June 13-17, 2010



STABILITY OF NANO-EMULSIFIED LYCOPENE UNDER THERMAL PROCESSING

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CSBE101357 – Presented at Section VI: Postharvest Technology, Food and Process Engineering Conference

ABSTRACT The stabilization of lycopene in food preparation and processing is a challenge for the development of functional foods and ingredients in the food industry. Soy-protein was used as emulsion carrier, and a non-emulsified lycopene sample was used as control sample in the present study. The stability of lycopene by nano-emulsion technology was evaluated under different thermal conditions. The first order kinetic model was used to monitor and reveal the changes of stability and antioxidant properties of nano-emulsified lycopene during thermal processing. The samples were heated for 5, 10, 15, 20, 25 and 30 min at temperatures of 60, 70, 80, 90, 100, and 120°C, respectively. The experimental data showed best fitting on the first order kinetic model with coefficient constant value (R^2) greatly than 0.91. The degradation of both contents and antioxidant properties of lycopene were observed during thermal process at high temperatures and long process times. In comparison of non-emulsified samples, the nano-emulsified samples were significantly more stable in both their content and antioxidant properties during thermal processing. Moreover, no significant changes were observed to their stability in regards to nano-emulsified samples under treatment at temperature of 60 to 80°C for 5 to 30 min. The results showed that the stabilization of lycopene by nano-emulsion showed a great potential for functional food applications.

Keywords: Lycopene, nano (micro) emulsion, stability