

Thermal Stability of Triglycerides in Edible Oils & Triolein Model Systems in the Presence of β -Carotene

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Triglycerides are the main components of the edible oils. The nutritional value of edible oils increases with increase of the presence of unsaturation in the fatty acid composition of the triglycerides. However, thermal oxidation influences significantly the fatty acids profile and its quality during cooking and hence the triglycerides chemistry. The presence of the natural antioxidants makes the oil resistant to oxidation. The addition of chain breaking antioxidants like β -carotene can increase the thermal oxidative stability and nutritional level. β -Carotene (50-300 $\mu\text{g/g}$) was added to the edible oils like sunflower, rapeseed and corn oils and triolein model systems of relatively similar triglyceride composition. The samples were oxidized in Rancimat at 110 °C and 20 L/h of air for 14 hours. The samples were analyzed using reversed phase LC-ELSD & LC-MS with propionitrile as eluent. Results suggest that upon increasing the β -carotene content the thermal stability of most of the triglycerides in edible oils increases or remains constant, while TAGs are more stable in the triolein model system. Thus, β -carotene plays a potential role during thermal oxidation, in protecting the useful ingredients i.e. triglycerides from further oxidation.

Key words

β -Carotene, rapeseed oil, sunflower oil, corn oil, triolein, triglyceride oxidation.