

Accepted Manuscript

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PII: S0260-8774(18)30114-6

DOI: [10.1016/j.jfoodeng.2018.03.011](https://doi.org/10.1016/j.jfoodeng.2018.03.011)

Reference: JFOE 9195

To appear in: *Journal of Food Engineering*



Please cite this article as: Athanasia M. Goula, Polyvios Prokopiou, Nikolaos G. Stoforos, Thermal degradation kinetics of L-carnitine, *Journal of Food Engineering* (2018), doi: 10.1016/j.jfoodeng.2018.03.011

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Thermal degradation kinetics of L-carnitine

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Abstract

The objectives of this work were to study the thermal degradation kinetics of L-carnitine and to develop a procedure for thermal inactivation kinetics determination from dynamic temperature profile experiments. Experiments were conducted at isothermal conditions in a temperature range from 80 to 130 °C. Remaining L-carnitine concentration was measured at predescribed time intervals at each temperature tested. The kinetic parameters $D_{T_{ref}}$ and z were determined after the first order kinetic behavior of L-carnitine thermal inactivation was verified. Furthermore, L-carnitine concentration data were collected during a non-isothermal experiment and the $D_{T_{ref}}$ and z values were determined through appropriate methodology. From the isothermal experiments, the parameters $D_{120^{\circ}\text{C}}$ and z were calculated equal to 50.4 min and 30.8 °C, respectively. Similar values ($D_{120^{\circ}\text{C}} = 52.0$ min and $z = 31.8^{\circ}\text{C}$) were obtained from the measurements during the dynamic temperature profile experiment. Based on the agreement between the parameters estimated using isothermal and non-isothermal temperature profiles, and given the reduced number of

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