

Mathematical Modeling of Carotenoids and Polyphenols Content of Faba Beans (*Vicia faba* L.) during Microwave Treatments

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Abstract : Given the importance of the preservation of polyphenols and carotenoids during thermal processing, we attempted in this study to investigate the variation of these two parameters in faba beans during microwave treatment using different power densities (1; 2; and 3W/g), then to perform a mathematical modeling by using non-linear regression analysis to evaluate the models constants. The variation of the carotenoids and polyphenols ratio of faba beans and the models are tested to validate the experimental results. Exponential models were found to be suitable to describe the variation of carotenoid ratio ($R^2 = 0.945, 0.927$ and 0.946) for power densities (1; 2; and 3W/g) respectively, and polyphenol ratio ($R^2 = 0.931, 0.989$ and 0.982) for power densities (1; 2; and 3W/g) respectively. The effect of microwave power density Pd(W/g) on the coefficient k of models were also investigated. The coefficient is highly correlated ($R^2 = 1$) and can be expressed as a polynomial function.

Keywords : microwave treatment, power density, carotenoid, polyphenol, modeling

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