

Microwave Assisted Blanching and Novel Freezing Methods of Fruits.

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Fruits and vegetables are mainly seasonal and they are characterized as perishable food matrices due to their short shelf life as several deterioration mechanisms are being involved. Prior to the common preservation methods like freezing or canning, fruits and vegetables are being blanched in order to inhibit subsequent deteriorative enzymatic mechanisms. Both conventional blanching pretreatments and conventional freezing methods hide drawbacks behind their beneficial impacts on the extension of the self-life of those matrices. Conventional blanching methods may require longer processing times, leaching of minerals and nutrients due to the contact with the warm water which in turn leads to effluent production with large BOD. As fruits and vegetables have very sensitive microstructure, an important issue of freezing technologies is the size of the formed ice crystals which is also critical for the final quality of the frozen food as it can cause irreversible damage to the cellular structure and subsequently to degrade the texture and the colour of the product.

Herein, the developed microwave blanching methodology and the results regarding enzyme inactivation will be presented. Moreover, heat transfer phenomena, mass balance, temperature distribution, and enzyme inactivation (such as Pectin Methyl Esterase and Ascorbic Acid Oxidase) of our microwave blanching approach will be evaluated based on measurements and computer modelling. The present work is part of the COLD μ WAVE project which aims to the development of an innovative environmentally sustainable process for blanching and freezing of fruits and vegetables with improved textural and nutritional quality.

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