



## MICROWAVE OSMOTIC DEHYDRATION OF MANGO CUBES UNDER CONTINUOUS FLOW MEDIUM SPRAY CONDITIONS USING SOLUTE MIXTURES

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### Abstract

The research evaluated the influence of solutes such as sucrose (S), sucrose:maltodextrin (S:MD), sucrose:dextrose (S:D) on mass transfer kinetics. The study demonstrated an enhanced ML/SG ratio with S:MD (85:15), which led to further study the various grades of maltodextrin (10, 15 and 18 DE), where MD 10DE was found to perform better than the other two grades in facilitating better ML, limiting SG and improving ML/SG ratio. The Azuara model was also shown to well fit the experimental data for mass transfer kinetics. The MWODS process was optimized with S:MD in the 84:16 proportion showed better mass transfer characteristics as well as higher product quality. Furthermore, a CCRD was employed to optimize the MWODS-air drying process based on mass transfer, quality and physical properties of finished dried product. In addition, the Microwave vacuum drying (MVD) was also evaluated as a finish drying method and the results were compared with air drying, freeze drying and vacuum drying methods, where it was found that the MWODS pre-treated mangoes with S:MD followed by MVD gave the shortest overall drying time, better structural stability as well as quality characteristics positioning itself next to the freeze-drying method (considered as the best). Overall, this thesis research contributes to a better understanding of mass transfer behavior of MWODS employed with different solute mixtures, and for comparing finish drying under conventional air drying, MVD and freeze-drying conditions. Sucrose and maltodextrin mixtures yielded much higher ML, limited SG and improved ML/SG ratio and product quality in dried mango cubes.



### About the Candidate

Bhakti is a Ph.D. candidate in the department of Food Science and Agricultural Chemistry under the supervision of Dr. Ramaswamy. She completed an Honors B. Tech in Food Science from MAU, University, India and her graduate degree in Food Technology from RTMNU, University, India. Her doctoral research focuses on a novel process of microwave osmotic dehydration where she worked with different solute mixtures and studied its influence on dehydration of mangoes with various finished drying methods.