

OPTIMIZATION OF PROCESS PARAMETERS FOR MICROWAVE ASSISTED UV STERILIZATION SYSTEM FOR ORANGE JUICE

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ABSTRACT

A microwave assisted ultraviolet light sterilization system (MWUV) was developed to study the synergistic effect in the sterilization of orange juice. This study used Response surface methodology (RSM) based on Box-Behnken design to get the optimum sterilization condition of MWUV and to analyse its effect on viable bacterial count and biochemical properties. Three independent variables; microwave power (200–500 W), flow rate (120–200 mL/min) and treatment time (0–20 sec) were taken for this study. The optimized processing parameters such as total plate count for bacterial load (1.26 log CFU/mL), total phenols (641 mg GAE/L), L* (57.63), a* (6.37), b* (53.81) and Vitamin C (264.2 mg/L) were found at the microwave power (500 W), flow rate (166 mL/min) and treatment time (9.51 sec). The fresh untreated sample was taken as control. The results showed MWUV could be a fast and effective method for sterilization of orange juice and other liquid foods without negotiating the quality of the sample.