



## CLASSIFICATION OF THE ENERGY AND EXERGY OF MICROWAVE DRYERS IN DRYING KIWI USING ARTIFICIAL NEURAL NETWORKS

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### ABSTRACT

This investigation uses the artificial neural network model to classify the energy and exergy of the kiwi drying process in a microwave dryer. In this experiment, classification was carried out separately for various pre-treatments and microwave powers using three pretreatments (oven, ohmic, and control treatments) and microwave power values (360, 600, and 900W), and the artificial neural network model. Classification was done using 5 different input data groups. The first group included the overall data (energy efficiency, special energy loss, exergy efficiency, and exergy loss), while the second to fifth groups included the data on the exergy efficiency, special energy loss, energy efficiency and special exergy loss in the order mentioned, which served as the classification inputs. Considering the results, the best R and Percent Correct values for the oven (Percent Correct=90 – R=0.709) and ohmic (Percent Correct=83.33– R=0.846) pretreatments were obtained. The values of this parameters were also calculated for the control (Percent Correct=71.43 – R=0.843), the 360W power (Percent Correct=92.86 – R=0.9975), the 600W power (Percent Correct=100 – R=0.9124), and the 900W power (Percent Correct=100 – R=0.9685). The overall data was used in the classification phase. In addition, the maximum correctly detected data for the oven, ohmic, and pretreatment was 18 (20 items), 15 (18 items), and 5 (7 items), respectively. The maximum correctly detected data for the 360W power, 600W power, and 900W power levels was 13 (14 items), 15 (15 items), and 16 (16 items), respectively. In sum, the neural network using the overall data input displayed acceptable efficiency in classifying the energy and exergy data of the kiwi drying process in microwave dryers

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