

## **Application of artificial neural network to predict colour change, shrinkage and texture of osmotically dehydrated pumpkin**

### **ABSTRACT**

The objectives of this study were to use Artificial Neural Network (ANN) to predict colour change, shrinkage and texture of osmotically dehydrated pumpkin slices. The effects of process variables such as concentration of osmotic solution, immersion temperature and immersion time on the above mentioned physical properties were studied. The colour of the samples was measured using a colorimeter and the net colour difference changes,  $\Delta E$  were determined. The texture was measured in terms of hardness by using a Texture Analyzer. As for the shrinkage, displacement of volume method was applied and percentage of shrinkage was obtained in terms of volume changes. A feed-forward backpropagation network with sigmoidal function was developed and best network configuration was chosen based on the highest correlation coefficients between the experimental values versus predicted values. As a comparison, Response Surface Methodology (RSM) statistical analysis was also employed. The performances of both RSM and ANN modelling were evaluated based on absolute average deviation (AAD), correlation of determination ( $R^2$ ) and root mean square error (RMSE). The results showed that ANN has higher prediction capability as compared to RSM. The relative importance of the variables on the physical properties were also determined by using connection weight approach in ANN. It was found that solution concentration showed the highest influence on all three physical properties.