Narumon Chomboonmee 2010: Raw Material Characteristic Prediction for Packing Media Preparation in Canned Pineapple Production Line. Master of Science (Agro-Industrial Technology Management), Major Field: Agro-Industrial Technology Management, Department of Agro-Industrial Technology. Thesis Advisor: Assistant Professor Parthana Parthanadee, Ph.D. 134 pages.

Packing medium (PM) preparation is an important process in canned pineapple production lines, as the cut-out strengths of the canned pineapple products depend on the strength of the PM filled in the cans, the total soluble solids (TSS) of the raw material (RM) juice, and the ratio of RM to PM. The TSS, measured as degree Brix, is an estimate of sugar content in the fruit juice, which greatly depends on the ripeness and succulence of the fruits. The PM, which matches with the degree Brix of the RM, needs to be prepared in advance in order to reduce the delay in the production process. The accurate RM degree Brix prediction would support this advance PM preparation greatly. This research presented the developments of RM degree Brix prediction models and a simple decision support system (DSS) for PM degree Brix preparation for canned pineapple production lines of the Malee Sampran PCL plant. The models considered consisted of multiple regression models, artificial neural network (ANN) models and decision trees models, including the classification and regression tree (CART) and Chi-square Automatic Iteration Detector (CHAID). The results showed that the ANN model with Month (indicating the season of cultivation), Color grade of the pineapples (indicating the pineapple ripeness), Amphoe and Supplier of raw materials (indicating the pineapple source) input as independent variables was found to be the best prediction model. However, there were no significant differences among the prediction errors obtained from all considered models. The DSS was therefore developed to present all the predicted RM degree Brix values from all models. To enhance the program ability in predicting the values from any other data inputs, the prediction reliability was classified into five levels. The very high and high reliability levels were resulted from the inputs of the independent variables that matched with the data sets used to construct the prediction models, hence yielding high prediction accuracy. The medium reliability level was resulted from the data inputs in which the Amphoe and Supplier variables were alternated from those presented in the actual data. The low and very low reliability levels were presented when raw materials were supplied from new sources, hence giving high prediction error values. This developed DSS program also showed the best prediction value and other important statistics, along with the required PM degree Brix calculation, to support the users' decisions.

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