Thakul Kukiatikul 2009: Shelf Life Prediction of Pasteurized Drinking Yogurt by Centrifugation. Master of Engineering (Food Engineering), Major Field: Food Engineering, Department of Food Engineering. Thesis Advisor: Ms. Sukanya Wichchukit, Ph.D. 156 pages.

The goal of this research was to study the prediction of phase separation in pasteurized drinking yogurt, using an artificial neural network with physical and bio-chemical properties. Three brands of pasteurized drinking yogurts were stored at 4-7°C for 28-35 days. Physical and bio-chemical analyses were conducted at days 0, 7, 14, 21, 28, and 35. The data obtained were: total bacteria count, pH value, total acidity value, and centrifugal separation value. Two types of centrifuges were used: a fixed angle rotor centrifuge and a swing-out rotor centrifuge. The relative centrifugal force (RCF) values used for the fixed angle rotor centrifuge were 60 g, 112 g, 201 g, and 314 g; the RCF values used for the swing-out rotor centrifuge were 77 g, 168 g, and 350 g. An artificial neural network simulation was performed using MATLAB software. The network was feed forward and used a Backpropagation algorithm for the training-learning process and used a sigmoidal transform function for the activation function. The network architecture consisted of input layers, hidden layers, and an output layer. To construct the network, the data were divided into 2 groups. 70% of data set was used for the training and learning process; 30% of the data set was used for the validation process.

The overall prediction models, which used the data of every brand, were less accurate than the single prediction models, which used the data of a specific brand and drinking yogurt type. For the accuracy test, the prediction models for overall drinking yogurts obtained from a fixed angle rotor centrifuge and a swing-out rotor centrifuge gave coefficients of determination (R^2) of 95.92 and 88.67 %, respectively. The accuracy of the models might be increased by choosing appropriate input data and adding more input data in the network structure.

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