INTELLIGENT SYSTEM FOR PASTEURISED MILK QUALITY ASSESSMENT AND PREDICTION

Marimin¹, Winnie Septiani², Sukardi¹ and Tatit K. Bunasor¹

¹Department of Agroindustrial Technology, Faculty of Agricultural Technology

Bogor Agricultural University (IPB), Bogor, Indonesia

Email: marimin@indo.net.id

²Department of Industry Engineering, Trisaksi University, Jakarta, Indonesia

Email: win-nie@lycos.com

ABSTRACT
The aim of this research was to develop an intelligent system for pasteurised milk quality assessment and prediction that could help the quality decision makers to assess and predict the pasteurised milk quality. Utilizing Expert System and Artificial Neural Network (ANN), which called SINKUAL-SP, did these analyses. The reasoning strategy used was “Forward Chaining” and the tracing method used was “Best First Search”. Certainty Factor (CF) was used for handling uncertainty.

Multi-layer neural network architecture was used. The suited activation function was Sigmoid Bipolar, which gave the best performance network with learning rate 0.005 and momentum 0.9 together with RMSE, MSE and SSE as an error criterion. The validation for neural network indicated the conformity between the output of neural network and the goal output with RMSE value of 0.0099.

The system was verified and validated by using real data collected from pasteurised milk and milk Products Company at West Java, Indonesia. In this company, the quality of fresh milk was at grade B (good), the quality of process was at grade A and the quality of packaging and storage was at grade B. This system suggested the user to always improve the quality of pasteurised milk to achieve grade A quality.

Based on the system output, quality system reconstruction was the highest priority strategy. The quality improvement system seemed to be a way to improve the process quality of pasteurised milk.

Keywords: Neural Network, expert system, pasteurised milk, quality system, soft system.
August 2007.