

Research Title: The Use of Image Processing and Statistical Techniques for Process Control in Food Industry

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ABSTRACT

The objective of the study is to construct the measurement instrument for detecting color quality using image processing and statistical process control. The color of sausage plays a physically-critical role to customer decision and satisfaction. However, the current inspection of the product is performed by human. Tiredness and boredom might lessen their performance. In addition, inspection results are not recorded for further analysis; good or bad results are shown.

The instrument acquires the image of sausage then extract the color quality from RGB system to L*a*b* system by MATLAB coding. The gage repeatability and reproducibility study are used to analyze the variation of the instrument system. The result indicates that the instrument is capable of distinguishing sausage product.

Next, the image data collected are investigated their characteristics namely normality, independency, and autocorrelation. It appears that the data are not independent and leads to the violation of Shewhart's chart family assumptions. Then, Hotelling T^2 is used with the test of spike and mean shift abnormality. The individual control chart for all three L*a*b* are also recommended. These three charts assist engineers to investigate the cause of out-of-control signal for further process improvement.

Keywords : Color inspection, Image processing, L*a*b* system, Sausage production, Statistical process control