Abstract

Research Title Rapid determination of aerobic bacteria, yeast and mold in sweet basil by near infrared spectroscopy (NIRS)
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Research Grant Fisical Year 2015 Research and Development Institute, Silpakorn University
Year of completion 2016
Type of research Applied research
Subjects Agriculture and Biology, Sub-group: Agro-industry

The objective of this study was to use near-infrared spectroscopy (NIRS) and hyperspectral imaging (HSI) as rapid and non-destructive techniques to analyze moisture content, total microbial, *E. coli*, yeast and mold in flesh sweet basil. Total sweet basil were taken for spectrum acquisition using an FT-NIR spectrometer (800 - 2500 nm) in reflectance mode with a nominal resolution of 16 cm^{-1} and scan time of 32 and the samples were imaged by reflectance HSI at the wavelength of 400 - 1000 nm. Then sample was examined for moisture contents, total microbial, *E. coli*, yeast and mold in flesh of sweet basil. Calibration and validation models of both techniques were built using a partial least square regression analysis. It was found that NIRS was suitable for determining the moisture content, total microbial, *E. coli*, yeast and mold that provided the coefficient of determination (R^2) of 0.65 and 0.83 respectively and gave the root squares error of prediction (RMSEP) of 0.963 % and $3.18x10^4$ cfu/g fresh weight, respectively. While, the HSI could not be used for determining moisture content, total microb, *E. coli*, yeast and mold in flesh of sweet basil, due to low R^2 of 0.37, 0.29 and 0.11, respectively and high RMSEP of 1.2 $x10^7$ cfu/g 6.1 $x10^8$ cfu/g and 3.9 $x10^5$ cfu/g fresh weight, respectively.

Keywords: bacteria, yeast, mold, sweet basil, contamination, food safety