

**MONITORING PARAMETER KUALITAS BUAH KLIMATERIK
SELAMA PENYIMPANAN DENGAN VARIASI SUHU RUANG
PENYIMPANAN SECARA NON-DESTRUKTIF MENGGUNAKAN
SPEKTROSKOPI *VISIBLE- SHORTWAVE NEAR-INFRARED* (VIS-
SWNIR)**

INTISARI

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Penilaian karakteristik kualitas buah umumnya diukur menggunakan metode destruktif yang tidak dapat digunakan secara cepat, tidak *realtime*, dan hanya representatif dari kelompok sampel. Penggunaan metode non-destruktif spektroskopi *visible-shortwave near-infrared* (Vis-SWNIR) dengan panjang gelombang 400 – 1000nm lebih baik untuk mengukur parameter kualitas buah karena minimum gangguan molekul air. Metode tersebut menghasilkan data secara *realtime*, sehingga dapat digunakan sebagai metode monitoring kualitas buah. Penilaian secara objektif untuk monitoring perubahan buah selama proses penyimpanan akan sangat membantu optimalisasi proses pascapanen dan distribusi. Namun spektroskopi Vis-SWNIR dipengaruhi oleh beberapa faktor salah satunya yaitu suhu bahan dan lingkungan pengukuran. Penelitian ini bertujuan menganalisis model PLSR untuk monitoring kualitas buah pada suhu penyimpanan selama proses penyimpanan. Sampel dalam penelitian yaitu buah jambu biji, sawo, dan pisang kepok yang disimpan selama 10 hari pada suhu penyimpanan $\pm 8^{\circ}\text{C}$, $\pm 14^{\circ}\text{C}$, dan $\pm 28^{\circ}\text{C}$. Model prediksi parameter kualitas yang digunakan adalah kadar air, total padatan terlarut, dan total asam. Hasil penelitian pada model prediksi saat akuisisi pada suhu penyimpanan $\pm 28^{\circ}\text{C}$ diperoleh R^2 0,726 – 0,939 dan suhu penyimpanan $\pm 14^{\circ}\text{C}$ diperoleh R^2 0,720 – 0,874 dapat diaplikasikan dalam proses monitoring. Kinerja model prediksi mengalami penurunan dengan penurunan suhu penyimpanan sebagai suhu akuisisi. Model prediksi pada suhu penyimpanan $\pm 8^{\circ}\text{C}$ R^2 di bawah 0,66 tidak direkomendasikan untuk proses monitoring.

Kata kunci: spektroskopi Vis – SWNIR; model PLSR; suhu penyimpanan

**NON-DESTRUCTIVE MONITORING OF CLIMATERIC FRUIT
QUALITY PARAMETERS DURING STORAGE WITH STORAGE
TEMPERATURE VARIATIONS USING VISIBLE-SHORTWAVE NEAR-
INFRARED SPECTROSCOPY (VIS-SWNIR)**

ABSTRACT

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Assessment of fruit quality characteristics is generally measured using destructive methods that is time-consuming, not real-time, and only represents a sample group. A non-destructive measurement method using visible-shortwave near-infrared (Vis-SWNIR) spectroscopy at 400 – 1000nm has a better ability to measure fruit quality parameters due to the minimal interference of water molecules. This method generates data in real time, allowing it to be used to monitor fruit quality. An objective assessment to monitor fruit changes during the storage process will greatly aid in the optimization of postharvest and distribution processes. However, Vis – SWNIR spectroscopy is greatly influenced by several factors, one of which is the temperature of the substance and the environment. This study aims to analyze the PLSR model of monitoring fruit quality at storage temperature during the storage process. The samples in this study were guava, sapodilla, and kepok bananas which were stored for 10 days at storage temperatures of $\pm 8^{\circ}\text{C}$, $\pm 14^{\circ}\text{C}$, and $\pm 28^{\circ}\text{C}$. The quality parameter prediction model used is water content, soluble solid content, and total acid. The results of the research on the prediction model during acquisition obtained R^2 0.726 - 0.939 at a storage temperature of $\pm 28^{\circ}\text{C}$ and R^2 0.720 - 0.874 at a storage temperature of $\pm 14^{\circ}\text{C}$, which can be used in the monitoring process. The performance of the prediction model decreases with decreasing storage temperature as acquisition temperature. Prediction models at storage temperatures of $\pm 8^{\circ}\text{C}$ R^2 below 0.66 are not recommended for monitoring processes.

Keywords: Vis – SWNIR spectroscopy; PLSR model; storage temperature