CLASSIFICATION MODEL OF CASSAVA QUALITY BASED ON NEAR-INFRARED SPECTROSCOPY (NIRS) AND CHEMOMETRY METHOD REVIEWED FROM AMYLOSE, AMYLOPECTIN, AND HCN CONTENTS

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ABSTRACT

Cassava is one of Indonesia's local carbohydrate sources that contains amylose, amylpectin and cyanide acid (HCN). Based on several studies stated that the difference of varieties, age, and geographical area affect the chemical content. A rapid and non-destructive method for cassava roots (n=25) classification was carried out using near-infrared spectroscopy (NIRS) couple with chemometrics. The purpose of this study was to develop a NIRS method couple with chemometric for cassava classification. The Chemometric method used for classification are linear discriminant analysis (LDA) and principal component analysis (PCA). The reference method used in amylose and amylpectin measurements is spectrophotometry UV-VIS, whereas HCN is an argentometric titration. The result of LDA model correctly classified 100% of the cassava roots based on varieties, age, and geographical area. PCA model has been successfully classified being four group areas on amylose with wavenumbers combination of 4052-4108 and 4264-4892 cm⁻¹, four group areas on amylpectin with wavenumbers combination of 7856-7912 and 8316-8356 cm⁻¹, and three group areas on HCN with wavenumbers combination of 4496-4544 and 6752-6804 cm⁻¹. The classification method using NIRS couple with chemometric demonstrate the potential use of the classification method established as quality control technique of cassava roots.

Keywords: cassava root, linear discriminant analysis, near-infrared spectroscopy, principal component analysis