

**PENGEMBANGAN MODEL PREDIKSI KADAR AIR, GLUKOMANAN,
DAN KALSIUM OKSALAT PADA TEPUNG PORANG SECARA
NON-DESTRUKTIF MENGGUNAKAN METODE
SPEKTROSKOPI *NEAR INFRARED***

INTISARI

Oleh:

KHOIRUNNISAA

20/456390/TP/12685

Tepung porang merupakan salah satu produk turunan umbi porang yang sedang digencarkan sebagai komoditas ekspor. Kualitas tepung porang ditentukan dari kadar air, glukomanan, dan kalsium oksalat. Pengujian kualitas tersebut umumnya dilakukan dengan metode destruktif sehingga membutuhkan waktu yang lama, tidak *realtime*, dan hanya representatif dari sekelompok sampel. Metode nondestruktif spektroskopi *Near Infrared* dengan Panjang gelombang 700—2500 nm cocok dilakukan untuk pengujian kualitas tepung porang karena memerlukan waktu yang singkat dan hasilnya *realtime*. Penelitian ini dilakukan untuk membangun model prediksi kandungan glukomanan, kalsium oksalat, dan air pada tepung porang dengan melakukan *preprocessing* dan analisis menggunakan metode *Partial Least Square Regression* (PLSR). Sampel tepung porang yang digunakan untuk analisis kadar air yaitu sampel yang disimpan pada tempat lembap dengan variasi waktu penyimpanan selama 20 hari, sedangkan sampel untuk analisis kadar glukomanan dan kalsium oksalat yaitu dari 54 jenis tepung porang. Hasil penelitian model prediksi kadar air diperoleh nilai R^2 0,983, kadar glukomanan diperoleh nilai R^2 0,861, dan kadar kalsium oksalat diperoleh nilai R^2 0,789. Dari hasil R^2 tersebut dapat disimpulkan bahwa metode *preprocessing* yang digunakan dapat memperbaiki model, dibuktikan dari perhitungan nilai $F_{\text{test}} > F_{\text{tabel}}$.

Kata kunci: Tepung porang, Spektroskopi NIR, PLSR, *Preprocessing*

DEVELOPMENT OF PREDICTIVE MODELS FOR WATER, GLUCOMANNAN, AND CALCIUM OXALATE CONTENT IN KONJAC FLOUR NON-DESTRUCTIVELY USING NEAR INFRARED SPECTROSCOPY

ABSTRACT

By:

KHOIRUNNISAA

20/456390/TP/12685

Porang flour is one of the derivative products of porang tubers that is being promoted as an export commodity. The quality of porang flour is determined by the water content, glucomannan, and calcium oxalate. The quality testing is generally carried out using destructive methods so that it takes a long time, is not real-time, and is only representative of a group of samples. The non-destructive method of Near Infrared spectroscopy with a wavelength of 700-2500 nm is suitable for testing the quality of porang flour because it takes a short time and the results are real-time. This study was conducted to build a prediction model for the content of glucomannan, calcium oxalate, and water in porang flour by preprocessing and analyzing using the Partial Least Square Regression (PLSR) method. The porang flour samples used for water content analysis were samples stored in a humid place with a storage time variation of 20 days, while the samples for glucomannan and calcium oxalate content analysis were from 54 types of porang flour. The results of the water content prediction model obtained an R^2 value of 0.983, glucomannan content obtained an R^2 value of 0.861, and calcium oxalate content obtained an R^2 value of 0.789. From the R^2 results, it can be concluded that the preprocessing method used can improve the model, as evidenced by the calculation of the F_{test} value $> F_{table}$.

Keywords: Porang flour, NIR spectroscopy, PLSR, *Preprocessing*