INTISARI

ANALISIS TEKNIS PENGARUH VARIASI SUB – SPESIES dan DISTRIBUSI UKURAN PARTIKEL TERHADAP SIFAT FISIK DAN MEKANIS BERAS *(Oryza Sativa L.)*

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Beras *(Oryza Sativa L.)* adalah salah satu makanan pokok masyarakat Indonesia. Kebutuhan konsumsi beras yang cukup tinggi memerlukan ketersediaan beras dengan jumlah dan mutu yang tinggi. Dalam perancangan alat dan proses pengolahan beras dibutuhkan informasi sifat fisik dan sifat mekanis agar kualitas dan kuantitas produk yang dihasilkan optimal.

Tujuan penelitian ini adalah mengetahui pengaruh variasi jenis *Indica, Japonica, Javanica* dan distribusi ukuran partikel kelas premium, medium 1, dan medium 3 terhadap sifat fisik dan mekanis beras. Kelas mutu beras premium terdiri dari 100% beras utuh, medium 1 terdiri dari 83% beras utuh; 15% beras patah; dan 2% menir, sedangkan kelas mutu beras medium 3 terdiri dari 65% beras utuh; 30% beras patah; dan 5% menir. Sifat fisik dan mekanis yang dikaji yaitu dimensi, *mean geometric*, kebulatan, *apparent density*, *tapped density*, porositas, berat satuan partikel, kecerahan, derajat keputihan, kekerasan, kecepatan terminal, *angle of internal friction,* dan *angle of wall friction.*

Berdasarkan hasil anova dua arah diperoleh bahwa jenis dan distribusi ukuran partikel mempengaruhi nilai semua parameter sifat fisik dan mekanis beras, tetapi jenis tidak mempengaruhi nilai *angle of wall friction.* Sedangkan interaksi antara kedua variasi mempengaruhi nilai dimensi, *mean geometric*, kebulatan, berat 1000 butir, *tapped density*, *apparent density*, berat satuan partikel, porositas, kecepatan terminal, dan *angle of wall friction.*

Kata kunci : beras, distribusi ukuran partikel, jenis, kelas mutu beras, sifat fisik, sifat mekanis.

ABSTRACT

ENGINEERING ANALYSIS THE EFFECT OF TYPE VARIATION AND PARTICLE SIZE DISTRIBUTIONS ON PHYSICAL AND MECHANICAL PROPERTIES OF RICE (*Oryza Sativa L.*)

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Rice *(Oryza Sativa L.)* is one of the staple food in Indonesia. The high consumption rate of rice in Indonesia, requires to increase rice production in both quality and quantity. For the development of equipments and processing of rice need the information of physical and mechanical properties of rice to get an optimum quality and quantity.

The purpose of this research was to identify the physical and mechanical properties of rice grain based on sub-species variation (Indica, Japonica, Javanica) and particle size distribution (premium class, medium 1, and medium 3). Premium class consist of 100% whole rice, medium 1 consist of 83% whole rice; 15% broken rice; 2% small broken rice (menir), while medium 3 consist of 65% whole rice; 30% broken rice; and 5% small broken rice (menir), Physical and mechanical properties that being identified are dimention, mean geometric, sphericity, apparent density, tapped density, porositas, particle density, lightness, whiteness index, hardness, terminal velocity, angle of internal friction, and angle of wall friction.

Based on the result of two ways anova indicated that the variation of sub-species and particle size distribution affected the physical and mechanical properties of rice, however the variation of sub-species did not affecting the value of angle of wall friction. While interaction between both variable affected the value of dimention, mean geometric, sphericity, weight of 1000 grains, tapped density, apparent density, particle density, porosity, terminal velocity, and angle of wall friction.

Keywords : mechanical properties, particle size distribution, physical properties, rice, rice classes, sub-species.