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Drying kinetics and mechanical strength of wet fermented cocoa beans using the microwave laboratory dryer

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Drying procedure of wet fermented cocoa beans was carried out using a specially fabricated microwave laboratory dryer. Fermented cocoa beans normally contain between 50 to 55% moisture and need to be dried to 6 to 8% (wet basis, wb) moisture levels for safe storage. Three levels of microwave power were used to dry the wet fermented cocoa beans. The moisture content of the beans was found to decrease rapidly. The increase in microwave power resulted in the increase drying rate of the cocoa beans. The experimental drying data were fitted to seven different theoretical drying models to predict the drying kinetics. Logarithmic model was found to be the best in describing the microwave drying characteristics of wet fermented cocoa beans with $R^2 > 0.9958$. The characteristics of the drying curve of the wet fermented cocoa beans for each microwave power level were compared between the experimental and the predicted model. The mechanical strength of the beans was found to be less when dried at higher microwave power.

Biography

Hidayatullah Bin Hj Hussein has completed his Master's degree in Agricultural Machinery from Universiti Putra Malaysia. He has held various posts in Malaysian Cocoa Board amongst others as a Manager in the Cocoa Innovation and Technology Centre in Nilai Negeri Sembilan, Malaysia. His area of specialization is mechanization and machinery design, food process engineering and chocolate making process and cocoa production. Currently he is a Senior Research Officer working in the area of cocoa drying.

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