

Warangkana Roobvichat 2008: Study and Development of Cassava Leaf Drying by Rotary Dryer Utilized Cassava Root Stem as Energy Source with Gasifier. Master of Engineering (Food Engineering), Major Field: Food Engineering, Department of Food Engineering. Thesis Advisor: Associate Professor Prapasri Singrat, M.App.Sc. 146 pages.

The objective of this study is to develop the process of cassava leaf drying by rotary dryer utilized cassava root stem as energy source with downdraft gasifier. The experiment was divided into 2 parts. Firstly, in order to investigate the possibility of gasification from cassava root stem with the downdraft gasifier, therefore, the size of cassava root stem (before chopping and after chopping by rough feed chopping machine.) was investigated. Result of performance test shown that the size reduction of cassava root stem to bulk density of approximately 140-155 kg/ m³ gave the continuous produced gas of 35.04 m³/hr and 70.07 °C before leaving the burner's head with 47.49 m³/hr inlet air flow rate and utilization 11.25 kg cassava root stem/hr. The compositions of produced gas were 1.64 % O₂, 43.60 % N₂, 14.05 % H₂, 24.04 % CO, 14.66 % CO₂ and 2.02 % CH₄ (% Vol). The thermal efficiency of the studied gasifier was about 59.24 %. Finally, The drying of cassava leaf by rotary drum dryer utilized cassava root stem as energy source with downdraft gasifier was studied. The variables for this study were fresh cassava leaf preparation (fresh cassava leaf chopping and fresh cassava leaf chopping after 12 hrs shading in the air) , fresh cassava leaf feeding weight (2, 4 and 6 kg) and the humid air exit diameters (20 and 30 cm) at fixed rotating drum speed of 4 rpm. The results of the experiment showed that the cassava leaf chopping after 12 hrs shading in the air with feeding weight of 6 kg and the humid air exit diameter of 20 cm, gave the shortest drying time. The dried cassava leaves contain 20.89 % crude protein in the dry matter, HCN 35.82 ppm (%db) and Tannin 15.22 ppm (%db). The HCN and Tannin contents are in the level of non-toxic to the animal.

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