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Performance evaluation of flat bed drying system for pepper drying

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Drying is the most important step of the pepper processing for a good quality final product. Sun drying produces poor quality final product with mould growth and contamination with dust, dirt, insect and other animal excreta. Quality is the necessary factor to enter international market. Though there are mechanical dryers in the market they are very expensive and mostly operated by electricity or fossil fuel. Hence their operation costs are very high. The study was to develop an appropriate dryer to overcome the all these issues in the pepper industry in Sir Lanka. The research was conducted at Post Harvest Technology Research Division, Research station of the Department of Export Agriculture, Matale. The dryer was an indirect heated batch type flatbed dryer operated with biomass (firewood) energy. The dryer consist with a simple drying chamber and hot air generator including furnace and heat exchanger.

Blanched pepper was used for the performance evaluation. Temperature fluctuation, moisture reduction and drying costs were considered for evaluation. The ambient temperature was fluctuated between 23 ^{o}C 31 ^{o}C during the tested period. The heated air temperature in plenum chamber was low at the beginning of the trials and increased up to 80 ^{o}C, but the drying bed temperature was not exceeded 60 ^{o}C. The moisture content of fresh pepper was raised up to 80 % after blanching. Three drying trails, 3 cm, 6 cm, and 9 cm of bed thickness were 50 kg, 100 kg and 150 kg capacities respectively. The final moisture content of three trails was reduced to 12 % within 9 hours, 10 hours, and 18 hours respectively. The drying cost of three trails was Rs. 13.86, Rs. 8.66 and Rs.10.21 respectively. Economical drying capacity of the dryer was 100 kg with 6 cm thickness. This dryer is suitable to introduce for medium scale pepper producing farmers. Further massive modification is needed to increase the capacity up to 500 kg.

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