

Solar drying characteristics of palm fruitlet under natural convection

ABSTRACT

Heating is a post-harvest treatment for palm fruitlets that halts enzymatic activities that causes the rise of free fatty acid (FFA) in palm oil-related end-products and prevent deterioration of materials due to microbial contamination. Microwave heating has been extensively utilized for this process. However, due to limited access to electricity in rural areas, solar drying is proposed as an alternate method to perform the process. A proven solar drying system (UMS EcoSolar Dryer) developed by Universiti Malaysia Sabah was used to perform the drying of palm fruitlet. This study focused on identifying the drying characteristics of palm fruitlet upon reaching its equilibrium moisture content (EMC) in an indirect type solar dryer under natural convection. Cumulative moisture loss of 17.05% was identified at EMC in 168 hours. An experimental drying curve of the drying process was established at the temperature range of 32.6 to 50.5 °C. The average air velocity measured at the drying chamber inlet was 0.26 m/s. Four mathematical models were used to describe the drying curve. Quadratic and logarithm equations are the best model to describe the constant rate period and falling rate period respectively.