

Design, development and testing of Universiti Malaysia Sabah (UMS) eco-solar dryer

ABSTRACT

Utilization of solar drying for food preservation would be a step towards sustainable food processing. Even today, most of the agricultural and marine products are dried under open sun-drying. However, this method is associated with several drawbacks, which then leads to the use of solar dryer. Universiti Malaysia Sabah (UMS) has developed a solar drying system with loading capacity of 50kg to enhance the drying process of various food products. Design parameters particularly focused in this project includes the air movement pattern in drying chamber, heating system employed, air circulation ventilation and the airflow configuration in solar heat collector. Results revealed that solar dried products attained desired moisture content in shorter drying time. Temperature profile in updraft and downdraft drying mode indicated that no temperature fluctuation occurred when switching in between. Maximum temperature achieved under complete solar mode were 65°C and 83°C for single-pass and multi-pass solar heat collector, respectively. Under solar-hybrid mode, higher temperature was attained under intermittent ventilation mode. It can be concluded that UMS Eco-Solar Dryer is an environmentally and economically efficient drying system for the food processing industry.