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Seminar Title	: Return Seminar-Effect of Ultrasound-assisted Osmotic Pre-treatment on Microwave Drying Characteristics and Quality of Radish Slices
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Venue	: CH 113
Date and Time	: 23 Aug 2024 (17.00)
Abstract	: Radish slices were subjected to ultrasound-osmotic dehydration at three sodium chloride solution concentrations (5, 10 and 15% w/w) and two solution temperatures (30 and 40°C) before microwave drying. The osmotic dehydration was carried out in ultrasonic bath operating at 40 kHz frequency. The model developed by Azuara was used to study the mass transfer kinetics in osmotic dehydration. The ultrasound-assisted osmotic dehydration showed a trend of rapid initial moisture loss followed by a progressive decrease in the rates in the later stages. The increase in moisture loss and salt gain showed a non-linear pattern as the immersion time progressed due to disarranged cell structure with the production of micro channels within cell walls because of osmotic pressure and cavitation. The moisture loss and the salt gain by radish slices increased with the increase in salt concentration in osmotic solution (5-15%) at constant solution temperature. The best condition for osmotic dehydration of radish slices was 15% solution concentration, 40°C solution temperature and 30 min dehydration time. It was selected based on the maximum moisture loss and permitted salt gain level in the radish slices. After the pre-treatment, the sample was microwave (MW) dried at a power density of 1 W/g by using a modified microwave oven of frequency 2.45GHz. The combined ultrasound osmotic dehydration and MW resulted in more homogeneous heating of the product by modification of its dielectric properties due to the salt uptake. Osmotically dehydrated radish slices resulted in shorter MW drying time as compared to untreated radish slices. Ultrasound- osmotic pre-treated MW dried sample retained about 1.7 times more total phenolics (246.028 mg GAE/100g), 1.9 times more total flavonoids (393.351 mg quercetin/100g), and 2.5 times more antioxidant capacity (0.973 m mol TE/100g) than the untreated-MW dried sample. Combining osmotic pre-treatment with ultrasound and MW gives better results in quality with reduced drying time. This combined process can be applied to various fruits and vegetables. Keywords: Ultrasound, osmotic dehydration, microwave, moisture loss, salt gain