MASS TRANSFER RATE AND OSMOTIC TREATMENT EFFICIENCY OF PEACHES

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ABSTRACT

The highest quality peaches *[Prunus persica* (L.) Batsch] are cultivated in areas with sunny summers, therefore the territory of the Autonomous Province of Vojvodina is a favorable region for their production. Peaches are usually consumed fresh, canned, or dried and represent a great source of important nutrients, including fiber, vitamins, and antioxidants. Osmotic dehydration is a well-known preservation method that relies on mild temperatures and low energy requirements. The Faculty of Technology Novi Sad research has introduced sugar beet molasses as an efficient osmotic solution for drying various food samples of animal and plant origin. In this experiment, peach samples were osmotically treated in sugar beet molasses solutions (60, 70 and 80% w/w), under atmospheric pressure, at different temperature regimes (20, 35 and 50°C) for 1, 3 and 5h. The goal was to investigate the impact of different osmotic solution concentrations, temperatures, and immersion time on the mass transfer rate and the efficiency of osmotic treatment. To follow the mass transfer change throughout the treatment, loss-RWL, rate of solid gain - RSG, weight reduction WR, rate of weight reduction - RWR, and dehydration efficiency index - DEI, were calculated based on previously determined the most significant process variables (moisture content, change in weight, and change in dry matter). To describe the structure of the research data that would offer a better perception of connections among diverse peach samples, PCA Principal Component Analysis (PCA) was applied. The results have shown that the mass transfer rate during osmotic treatment of peach samples in sugar beet molasses was the most intensive at the beginning of the process, at the highest solution concertation and the highest temperature. In accordance with the results, diffusion occurred most rapidly during the first 3 hours of the process; therefore, processing time can be reduced.

Keywords: osmotic dehydration, mass transfer rate, sugar beet molasses, peaches