FOOD MATRIX ARRANGEMENTS BASED ON WATER MOLECULE INTERACTION

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Abstract

Water in food can be treated as an integral part of non-aqueous constituent or bound water molecule. Based on membrane structure and its permeability, a mass and energy model of a water molecule interaction mechanism in chosen condensation and sedimentation processes has been considered.

Several food products were chosen with different wet basis moisture content. The model of water structure together with hydrophobic and hydrophilic strongly and weakly restricted bonds and their interaction in the products has been chosen. To describe the water molecule displacement, and their influences on food microstructure arrangements, two different approaches have been proposed for assessment of the condensed matter's structure: phenomenological-including mass and energy transport, and the molecular dynamic.

Phase diagrams from different computer programmes and numerical results, including comparison between the Lenard-Jones water molecule potential and Janus chain model used for the processes description show that the Janus chain model is more adequate for both the micro- and macroscopic structural information needed to predict the spatial food microstructure arrangements and their rheological properties.

The water molecule models applied to both meat and dairy products indicate that the water molecule interaction mechanism strongly influences food matrix formation process and its properties, which can differ in the character of the water molecules bonds associated with the complex food system.

***Key words**: Food matrix, Water molecule, Microstructure components*.