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Effect of sugar type and water content on the physical properties of marshmallows

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Marshmallow is an aerated confectionery product with a characteristic foamy structure created when air and moisture is incorporated into a sugar mixture containing gelatin. The air entrapped in the marshmallow matrix is responsible for its fluffy texture. Moisture absorption/loss of marshmallows during storage and transportation is one of the most important quality defects that make the product unacceptable. In this study, marshmallows prepared at different compositions were examined. Sugar type, concentration and initial moisture content of the samples were adjusted at different values. Sorption isotherms provide valuable information to decide the appropriate storage conditions for a product. There is no much literature about the sorption isotherms of marshmallows. As the first step, moisture sorption isotherms of the products were determined. Marshmallows were kept in a climacteric chamber at 6 different relative humidities at 25°C, 35°C and 45°C. Moisture contents of the samples were measured using a vacuum oven at 70°C after incubation and the absorption data was fitted to GAB and BET models. To understand the effect of different formulations on the shelf life of the products, (T_g) of the samples were measured using a Differential Scanning Calorimeter (DSC). T_g of the samples decreased as the water content decreased. The results showed that the type of the sugar and initial water content changed the T_g and thus the degree of crystallinity of samples as it is known that [T-T_g] is positively correlated with crystallinity.

Biography

Emrah Kirtil has earned his BS from Middle East Technical University Food Engineering and started his Postdoctoral studies in 2012 at the same department. He has also been working as a Research Assistant there for the last 2.5 years. He has published 3 papers in reputed journals.

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