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**Development of Fractional Viscoelastic Model for Characterizing Viscoelastic
Properties of Food Material during Drying**

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Abstract

Mechanical properties, specifically, viscoelastic properties of food materials are the most important characteristics which change significantly while drying is in progress. These changes of the viscoelastic properties have a great impact on the deformation of food material during drying. Understanding of the nature of this changing viscoelastic property is crucial for developing a realistic mathematical model for deformation during food drying. The viscoelastic properties of fresh food samples have been predicted using classical models such as Maxwell model and Burgers model. However, due to the diverse nature of food material, these models cannot predict various viscoelastic properties accurately (relaxation modulus, relaxation time, stiffness, coefficient of viscosity and creep compliance) during drying as conditions are continuously changed. In this context, the fractional viscoelastic model is proposed in this study as a new approach for predicting the accurate viscoelastic behaviour for food materials during drying. Therefore, the main aim of this paper is to develop and validate a viscoelastic model for characterizing viscoelastic properties of food material during drying using fractional viscoelastic model. The proposed model is used to capture the

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