

RELATIONSHIP BETWEEN VISCOELASTIC PROPERTIES OF HIGH-AMYLOSE RICE GEL AND MECHANICAL MIXING CONDITIONS

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In Japan, rice is a staple food has been consumed as cooked rice. However, for change and diversity of dietary habit, it is substituted by wheat products such as bread and pasta. As a result, rice consumption is decreasing by half in 50 years. We developed new rice application, that is, "Rice Gel". Processing high-amylose rice, which is rare cultivar in Japan, by gelatinization and mechanical mixing, we developed rice gel, which is a material for new rice food. The objective of this study is to investigate relationship between viscoelastic properties of high-amylose rice gel and mechanical mixing conditions. Polished high-amylose rice (Momiroman) was prepared in this study. Rice grains were gelatinized with several levels of amount of added water and then were allowed to mechanical mixing at several levels of mixing speed and time. Finally, mechanically mixed gelatinized rice was formed in an acrylic mold at room temperature. Dynamic viscoelastic moduli (G' and G'') of the rice gel samples were measured by using AR-G2 (TA Instruments). Amount of added water decreased G' of the rice gel samples, and increased tangent delta (G''/G'). In addition, Mixing time and speed also decreased G' , but did not significantly affect tangent delta. By controlling these conditions, physical properties of high-amylose rice gel are easily and widely controllable. High-amylose rice gel showed distinctive properties and texture. The experimental results suggest that high-amylose rice gel could be a newly developed rice product and is potentially applicable as a texture modifier.

Keywords: High amylose rice, high-speed shear, dynamic viscoelasticity

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