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## Abstract

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### Starch Damage and Pasting Properties of Rice Flours Produced by Dry Jet Grinding


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Milling method and particle size affect some properties of rice flour. To prepare ultra-fine rice flour of <math><30\ \mu\text{m}</math>, hammer and dry jet grinding methods were examined and the effect of particle size on starch damage and pasting properties of the flour were elucidated. A jet mill could make finer flour (<math><10\ \mu\text{m}</math> mean size) with a narrower particle size distribution than a hammer mill could. Starch damage increased dramatically at a mean size of <math><10\ \mu\text{m}</math>. Particles of a similar size (<math><60\ \mu\text{m}</math>) had different levels of starch damage between mills. Not only the particle size, but also the milling method affected the level of damaged starch. Flour samples of <math>\geq 45\ \mu\text{m}</math> mean size had similar viscosity curves, but samples of <math><20\ \mu\text{m}</math> had different curves. Peak viscosity and final viscosity decreased sharply at <math><10\ \mu\text{m}</math>. Setback viscosity for particles of <math>3\ \mu\text{m}</math> from both brown rice and white rice were higher than the peak viscosity. Stability to heat and shearing stress were decreased for <math><20\ \mu\text{m}</math> flours as the breakdown viscosities decreased. Starch damage and pasting properties of flour ground from the nonwaxy japonica cultivar Koshihikari changed dramatically at a mean size of <math><10\ \mu\text{m}</math>.

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