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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 <30 μm, 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 (<10 μm mean size) with a narrower particle size distribution than a hammer mill could. Starch damage increased dramatically at a mean size of <10 μm. Particles of a similar size (<60 μm) 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 ⩾45 μm mean size had similar viscosity curves, but samples of <20 μm had different curves. Peak viscosity and final viscosity decreased sharply at <10 μm. Setback viscosity for particles of 3 μm from both brown rice and white rice were higher than the peak viscosity. Stability to heat and shearing stress were decreased for <20 μm 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 <10 μm.