

Physicochemical Properties of Minimally Milled Brown Rice in Relation to Cooked Brown Rice Texture

Induck Choi^{1*}, Hye-Sun Choi¹, Jiyoung-Park¹, Nangeul Kim¹, Seuk-Ki Lee¹, Sang-Ik Han¹, Dong-Soo Choi²

¹National Institute of Crop Science, Crop Post-harvest Technology Division

²National Institute of Agricultural Science, Post-harvest Engineering Division

The cuticle layer of outermost bran layer, about 1~2% of whole kernel, was composed with mostly waxes, which prohibit entry of water into the kernel, resulting in lower eating qualities due to the hard texture of cooked brown rice. This work was conducted to investigate the physicochemical properties and texture of cooked brown rice from five rice cultivar. Removing cuticle layer resulted in mostly no significant difference ($P<0.05$) in ash, protein and fat content in brown rice and 1% milled brown rice except a few samples. Whereas, grain color became blighter due to 1% milling, which would be desirable for cooked brown rice. Among 5 rice cultivar, Josaengheugchal (JSHC), black colored waxy-rice, showed very low Hunter's L-values compared to the other 4 cultivar. Pasting viscosities were differed by the cultivar as well as 1% milling. In general, 1% milling increased peak and final viscosities, which affected the breakdown and setback viscosities. The texture properties of cooked brown rice were significantly differed due to 1% milling treatment. The 1% milled brown rice of 5 cultivar showed a significant decrease in hardness, but an increase in adhesiveness and stickiness ($P<0.05$). In specific, the JSHC reduced the hardness by 4 times, and Baegjinju (BJJ), medium-waxy rice, by 2 times. Whereas, the adhesiveness and stickiness were significantly increased in JSHC and BJJ, which would improve the eating qualities of cooked brown rice.

*Corresponding author: Tel. 031-695-0605, E-mail. ichoi829@korea.kr