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## **Storage properties of brown rice cultivar as affected by milling degree and storage conditions**

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### **Abstract**

Brown rice contains a variety of nutritional and bio-functional components compared to milled rice. However, low consumer preference for steamed brown rice and short shelf life has been implicated as deterrents to the direct consumption of brown rice. This study was undertaken to determine the effect of degree of milling (DOM) on pasting and aging properties of brown rice cultivar. Short-grain (Japonica type) brown rice cv. Boseogchal (BSC), Baegjinju (BJJ), and Hiami (HIAM) were evaluated every month during 4 months storage. Rice cultivar were categorized into waxy (BSC), medium-waxy (BJJ), and non-waxy (HIAM) of which amylose contents were 6.81%, 10.06%, and 16.69~16.72%, respectively. Peak viscosity was the highest in BJJ followed by HIAM, and BSC, showing peak viscosity was lower at low temperature storage. At storage at room temperature from 60 to 120 days, the FFA content significantly increased in the rice samples with DOM1% followed by 3% and 5%, while not significant increase in DOM0% brown rice: at 120 days, the FFA ranged in 28.35~41.48, 111.99~130.06, 76.87~91.99, and 47.13~62.37 mg KOH/100g for DOM 0%, 1%, 3% and 5%, respectively. It indicated that the fat rancidity was the least in the order of DOM 0%, 5%, 3% and 1%. Storage at low temperature could reduce fat hydrolysis with lower FFA release, but rice grain with 1% MD also released more FFA compared to the other samples. It could be assumed that the most outer bran layer, approximately 1~3%, could provide a strong protection from fat rancidity. Pasting viscosity of rice samples also increased with increasing DOM rate. Results indicated that DOM was the most significant factor for lipid rancidity during storage, resulting in high FFA formation. It suggested that brown rice with DOM 0% and/or more than DOM 5% could provide the best shelf life.

Keywords: brown rice, cultivar, degree of milling, storage properties

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