

A High Amylose-Content and High-Yielding Elite Line Is Favorable to Cook 'Nanhan' (Semi-Soft Rice) for Nursing Care Food Particularly for Serving Aged Persons

Authors : M. Kamimukai, M. Bhattarai, B. B. Rana, K. Maeda, H. B. Kc, T. Kawano, M. Murai

Abstract : Most of the aged people older than 70 have difficulty in chewing and swallowing more or less. According to magnitude of this difficulty, gruel, "nanhan" (semi-soft rice) and ordinary cooked rice are served in general, particularly in sanatoriums and homes for old people in Japan. Nanhan is the name of a cooked rice used in Japan, having softness intermediate between gruel and ordinary cooked rice, which is boiled with intermediate amount of water between those of the latter two kinds of cooked rice. In the present study, nanhan was made in the rate of 240g of water to 100g of milled rice with an electric rice cooker. Murai developed a high amylose-content and high-yielding elite line 'Murai 79'. Sensory eating-quality test was performed for nanhan and ordinary cooked rice of Murai 79 and the standard variety 'Hinohikari' which is a high eating-quality variety representative in southern Japan. Panelists (6 to 14 persons) scored each cooked rice in six items viz. taste, stickiness, hardness, flavor, external appearance and overall evaluation. Grading (-3 ~ +3) in each trait was performed, regarding the value of the standard variety Hinohikari as 0. Paddy rice produced in a farmer's field in 2013 and 2014 and in an experimental field of Kochi University in 2015 and 2016 were used for the sensory test. According to results of the sensory eating-quality test for nanhan, Murai 79 is higher in overall evaluation than Hinohikari in the four years. The former was less sticky than the latter in the four years, but the former was statistically significantly harder than the latter throughout the four years. In external appearance, the former was significantly higher than the latter in the four years. In the taste, the former was significantly higher than the latter in 2014, but significant difference was not noticed between them in the other three years. There were no significant differences throughout the four years in flavor. Regarding amylose content, Murai 79 is higher by 3.7 and 5.7% than Hinohikari in 2015 and 2016, respectively. As for protein content, Murai 79 was higher than Hinohikari in 2015, but the former was lower than the latter in 2016. Consequently, the nanhan of Murai 79 was harder and less sticky, keeping the shape of grains as compared with that of Hinohikari, which may be due to its higher amylose content. Hence, the nanhan of Murai 79 may be recognized as grains more easily in a human mouth, which could make easier the continuous performance of mastication and deglutition particularly in aged persons. Regarding ordinary cooked rice, Murai 79 was similar to or higher in both overall evaluation and external appearance as compared with Hinohikari, despite its higher hardness and lower stickiness. Additionally, Murai 79 had brown-rice yield of 1.55 times as compared with Hinohikari, suggesting that it would enable to supply inexpensive rice for making nanhan with high quality particularly for aged people in Japan.

Keywords : high-amylose content, high-yielding rice line, nanhan, nursing care food, sensory eating quality test

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