Hydrothermal treatment to increase head rice yield and improve palatability characteristics of rice

W A H Champa*, M D Fernando and K B Palipane
Institute of Post Harvest Technology, Research and Development Center, Jayanthi Mawatha, Anuradhapura

A major loss occurring in rice during post harvest operations is the breakage of kernels during processing, which involves conversion of paddy (rough rice) in to edible rice. Broken kernels are essentially a loss, because they have much lower market value than head rice. Parboiling of paddy reduces the level of breakage of rice during milling. However, some consumers, especially those who are used to eating raw (non-parboiled) rice, dislike the colour and also the cooking and eating qualities of parboiled rice. The present study was carried out to develop a mild hydrothermal treatment that could be applied to paddy, by controlling soaking and steaming times, which would minimize grain breakage during milling and, at the same time, preserve the whiteness, cooking and palatability characteristics of raw (non parboiled) rice.

Freshly harvested paddy belonging to the variety BG 352 was used for the study. Experimental samples were subjected to different soaking times namely 2, 4, 6, 8, 10 and 12 hours by immersing in water at ambient temperature (28 ± 2 ^{0}C). The paddy soaked for different periods was then steamed, with non pressurized steam at 100 ^{0}C, for different time periods namely, 15, 20, 25, 30 and 35 minutes. The treated paddy samples were dried in the shade until the moisture content was reduced to 14% and then analyzed for the following : total milling yield, grain breakage and whiteness. Only the treatments that had higher whiteness and lower percentage of grain breakage were selected to the sensory evaluation to test the palatability characteristics.

Acceptable values for grain breakage were observed in the treatments of soaking 2 hours and steaming 25 minutes; soaking 2 hours and steaming 30 minutes; soaking 2 hours and steaming 35 minutes; and soaking 4 hours and steaming 20 minutes and the values were 7.4%, 3.7%, 2% and 5.5% respectively. Their whiteness percentages were 36.5%, 33.8%, 30.5% and 32.7% respectively. Among the treatments selected the treatment of soaking for 2 hours and steaming for 25 minutes had the best palatability characteristics.

The results of this study showed that subjecting paddy to a hydrothermal treatment of soaking for 2 h at room temperature and steaming for 25 minutes could minimize grain breakage during milling while retaining a high of grain whiteness and palatability characteristics comparable to raw rice.

*rprdc@sltnet.lk Tele: 025 2225765/6