

Effect of pre-soaking techniques on cooking of parboiled brown rice

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Rice is the staple food of Sri Lankans with a per capita rice consumption of 114 kg/year in 2010. Parboiled rice is gaining more popularity among Sri Lankans because of its healthier nature than the raw rice. Households waste much of their energy on cooking, and parboiled rice consumes more energy than its raw one. Parboiled brown rice of Bg 406 samples was selected and the optimum pre-soaking duration was calculated based on graphical representation of hydration rate. Hydration was measured from each 30 minutes interval of soaking up to 300 minutes, each soaking interval considered as individual treatment. During soaking, the changes in water quality parameters, TDS, EC and pH were taken into account. The optimum rice to water ratio was determined by cooking rice samples from each soaking treatment with an induction cooker till no opaque core was observed when pressed between two glass plates. Cooking was performed at an hour interval of presoaking to evaluate the required quantity of water, cooking duration, energy consumption and keeping quality with sensory analysis with untrained panelists to observe the quality changes due to pre-soaking process, especially taste and keeping quality. The obtained results (soaked, and un-soaked) analyzed statistically with DUNCAN mean group separation and SAS 9.0 software package. The optimum presoaking duration was found to be 105 min. TDS and EC showed a similar nature of increasing pattern with extended soaking duration. The optimum water for cooking was 700, 680, 630, 610 and 590 ml under different treatments of no soaking, 1 hr, 2 hrs, 3 hrs and 4 hrs soaking respectively. Further, presoaking reduced the cooking time from 45 – 32 min from no soak condition to for 4 hrs soaking. Most importantly, the 4 hour soaking has significantly lower cooking energy (0.16 kW/h) than other conditions. The results of sensory analysis showed that the overall acceptability is best for no soaking, 1 hrs and 2 hrs soaking conditions. At the same time, the best keeping quality also was retained by these same treatments as 11, and 9 hours. By considering energy saving, 2 hrs pre-soaking is the best treatment to get better quality of cooked rice.

Key words: Energy consumption, Hydration, Parboiled, Sensory