



EVALUATION OF QUALITY PARAMETERS OF PARBOILED AND NON-PARBOILED ZINC BIOFORTIFIED BRRI DHAN84 RICE VARIETY IN BANGLADESH

Tanjina Akter^{1,2}, Md. Shihabul Awal¹, Md. Abdul Wazed³, Anwara Akhtar Khatun¹, Md. Shakil², Md. Murtuza Kamal⁴, Md. Hasan Al Banna⁵, N. H. M. Rubel Mozumder¹✉

¹Department of Food Science and Nutrition, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh.

²Department of Food Technology, Chulalongkorn University, Bangkok-10330, Thailand.

³Department of Food Engineering and Technology, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh.

⁴Department of Food Processing and Preservation, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh.

⁵Faculty of Nutrition and Food Science, Patuakhali Science and Technology University, Bangladesh.

✉ rubel.infs@hstu.ac.bd

<https://doi.org/10.34302/crpjfst/2023.15.3.6>

Article history:

Received: 11 September 2022

Accepted: 10 August 2023

Keywords:

*Biofortification,
BRRI dhan84,
Parboiling,
Quality parameters,
Zinc rice.*

ABSTRACT

Zinc deficiency is a global public health problem in developing countries, including Bangladesh, where rice is the primary consumed staple food. To combat zinc deficiency in Bangladesh, BRRI dhan84 (paddy) has been released as a zinc-biofortified and high-yielding rice variety. Therefore, the objective of this study was to evaluate the changes in physicochemical properties, nutritional attributes, and contents of zinc in newly released rice variety after parboiling and cooking using standard methods. Significant differences were noted among different properties. The study revealed that the parboiling method increased fat (2.36%), protein (9.42%), and zinc (2.741%), whereas those not using parboiling methods resulted in 1.72% fat, 6.68% protein and 2.732% zinc. In contrast, other components like fiber, carbohydrates, ash, and iron decreased after parboiling. Physicochemical analysis showed that parboiled rice was found to be slightly higher in length (6.507 mm), broader in width (2.032 mm), lower in solid gruel loss (0.090%), and also higher in head rice yield (80.09%) than non-parboiled rice. A prolonged cooking time of approximately 39.41 minutes was observed in parboiled rice as compared to non-parboiled rice. However, the cooking process negatively affected the nutrient contents of both parboiled and non-parboiled rice than uncooked or raw rice. Zinc content was generally similar between parboiled and non-parboiled rice after cooking (2.264-2.344 mg/100g). The sensory test further revealed that the parboiled rice obtained more overall acceptability, although the rice color was darker than that of non-parboiled rice. The study concluded that, depending on desired physicochemical and nutritional properties, the zinc-biofortified BRRI dhan84 rice variety could be the important option for improving rice grain nutritional quality to overcome the micronutrient problem in Bangladesh.