

Category	: International Rice Research Conference
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Endorsement email	:
Keyword 1	: Biofortification
Keyword 2	: Nutrient-dense rice
Keyword 3	: Community interventions
Title of Entry	: Retention of zinc and iron in biofortified rice after parboiling and milling
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Abstract : The dietary zinc intake in children from Bangladesh is below the recommended levels due to the reliance on staples foods with low zinc density such as rice. To improve the zinc in deficient populations, biofortified rice varieties with up to 28 µg/g of zinc (after parboiling and polishing) are being developed in Bangladesh, 12 µg/g (75%) higher than common commercial varieties. Two varieties of biofortified rice and a commercial non- biofortified variety were soaked, either at room temperature or at 63 °C, parboiled and polished. Zinc and iron concentration was measured by XRF. Zinc and iron concentration of non- parboiled brown rice was 22.5–32.1 µg/g and 12.5–17.6 µg/g, respectively. After parboiling, zinc and iron concentration was 22.8–36.2 µg/g and 15.6–20.2 µg/g, respectively. Zinc concentration after 7.5±0.5% degree of milling was 17.4–28.7 µg/g (78–89% retention) for non- parboiled rice, 16.8–24.6 µg/g (75–77%) for parboiled rice soaked for 24 h at room temperature, and 13.9–21.9 µg/g (59–68%) for parboiled rice soaked for 4 h at 63 °C. Iron in non- parboiled milled rice was 7.7–9.8 µg/g (56–62%) whereas in parboiled milled rice was 9.9–11.6 µg/g (64–83%). During parboiling zinc from inner endosperm moved towards the outer layers which were removed during milling, especially when rice was soaked at high temperature. Zinc was lost at a lower rate than iron in non-parboiled rice, at the same rate as rice soaked at room temperature, and at a higher rate than rice soaked at 63 °C (p<.05). Also, higher zinc and iron losses (p<.05) were observed when the degree of milling was 15%. These results suggest that paddy rice soaked at room temperature could provide higher zinc to the diet compared to paddy rice soaked in hot water, and parboiled rice should not be over- polished to ensure a higher intake of zinc form rice.

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