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Notes

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Biological efficacy of consuming rice biofortified with iron

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The World Health Organization estimates that 3.5 billion people in the developing world are affected by iron-deficiency anemia. Given the need for a sustainable solution to reduce this number, biofortified rice (variety IR68144) was used to test the feasibility of high-iron rice as a source of dietary iron. We conducted a double-blind longitudinal (9 months) intervention study with religious sisters from 10 convents in and around Manila, Philippines. Some 317 religious sisters were randomly assigned to consume either an iron-enhanced (high-iron) rice or a local variety of rice (control). Rice preparation and distribution were standardized. The sisters consumed their assigned rice at every meal and food intakes were weighed on 3 days every 2 weeks for each woman. Blood samples were collected at baseline, mid-point, and end-point and used to determine serum ferritin, the transferrin receptor, and hemoglobin, among other indicators of iron status. The efficacy trial indicated that the high-iron rice provided an additional 1.41 mg of iron per day, representing a 17% increase in dietary iron in the diets of these women. Ferritin and body iron levels were sig-

nificantly different at the end of the 9-month trial for the nonanemic women who consumed the high-iron rice instead of the control after controlling for baseline values, amount of rice consumed, and convent. The greatest changes in ferritin and body iron were observed in the women who consumed the most biofortified rice and the calculation of the amount of iron transferred from the diet to iron stores is consistent with the observed changes in body iron. Therefore, it is possible to conclude that there was a significantly positive effect of consuming biofortified rice on the iron status of women with an iron-poor diet.

Notes

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Radical-scavenging activity of red and black rice

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Rice (*Oryza sativa*) is widely consumed in the world, and the most common type (>85%) has a white pericarp. Other types have a colored pericarp, and the most common are green, black, and red. The black and red varieties are planted mainly in South Asia and other countries, such as Italy, Greece, and the United States (Simmons and Williams 1997). Rice with a colored pericarp has long been consumed in Japan and China and is considered to be a healthy food. We are especially interested in

the antioxidative and radical-scavenging properties of rice because of their potential to provide health protection against reactive oxygen species and free radicals, which have been implicated in more than 100 diseases (Halliwell 1992).

On the other hand, there have also been some reports concerning the antioxidative compounds found in rice. Gamma-oryzanol, which is a mixture of ferulate esters of triterpene alcohol, is well known as an antioxidant in rice bran (Xu et al