

**Abstract of a major presentation at the
International Conference**

Forging Effective Strategies to Combat Iron Deficiency

**Atlanta, GA USA
7-9 May 2001**

**Organized and sponsored by:
ILSI Center for Health Promotion
Centers for Disease Control and Prevention
Emory University
Micronutrient Initiative**

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Experiences on Rice Fortification in the Philippines

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Interest in rice fortification in the Philippines was revived in the early 1980s with the recognition of the serious consequences of iron deficiency anemia. Consequently, FNRI modified the coating technology originally developed by Hoffman la Roche. The revised technology involves the coating of ordinary rice with an alcoholic solution of ferrous sulfate and a suitable coating mixture to produce a premix, which is then mixed with ordinary rice at 1:199 dilution to produce iron-fortified rice (IFR). Satisfactory acceptability and sensory tests, followed by a field trial in one municipality, formed the basis for a clinical trial in 1995 involving 218 school children who were randomly assigned into experimental and control groups. The results indicated a significantly greater increase in mean hemoglobin and a significant reduction in the prevalence of anemia in the experimental group after 6 months of feeding compared to the control subjects. *In vivo* bioavailability studies using radio-iron revealed iron bioavailability from a mixed meal of 5.4%. Subsequent *in vivo* studies showed that the iron bioavailability of NaFeEDTA- and ferrous sulfate-fortified rice in a mixed meal were not significantly different. Other studies showed the effect of binder and fortificant on the color, cost and iron retention of the premix.

Recently, an iron-fortified rice subsidy program was piloted by the Department of Social Welfare and Development and the National Food Authority (NFA) using the FNRI coating technology in two provinces among 2,100 poorest-of-the-poor families. Consumer acceptability was good. A pre-post evaluation among 467 randomly selected children age 8-12 yr showed significant increase in mean Hb and serum ferritin levels among anemic children after 6 months of the intervention. Currently, iron-fortified rice is being distributed nationwide under the auspices of the Department of Education, Culture and Sports and NFA as part of a subsidized breakfast among ~45,000 grade II public school children. Unfortunately, no effort to evaluate its effectiveness is being conducted. Meanwhile, a food fortification bill was recently approved into law, mandating the fortification of all rice sold in the country, along with wheat flour, cooking oil, and sugar, within 4 years. The plan is to initially produce iron-fortified rice in the government-controlled rice mills that sell rice at low cost mainly to the low-income group of the population. Efforts to improve the technology are currently underway with the objective of reducing cost and minimizing losses during storage and washing. Alternatively, a strategy of putting the iron fortificant in sachets to be included in every pack or bag of rice when sold is being contemplated.