

HEALTH | FORTIFIED RICE

# ADDED BENEFITS, HIDDEN COSTS?

MAKING FORTIFIED RICE A NATIONAL STANDARD IS A WELL-INTENTIONED MOVE, BUT EXPERTS WARN OF THE RISKS OF OVERDOSING ON MICRONUTRIENTS

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**INDIA'S 75TH INDEPENDENCE DAY**, Prime Minister Narendra Modi announced that the government will, by 2024, supply rice fortified with nutrients through the Public Distribution System (PDS) and food schemes targeting women and children. As a forerunner, to combat chronic anaemia and undernutrition, the Union ministry of consumer affairs, food & public distribution will distribute fortified rice through the Integrated Child Development Services (ICDS) Scheme and the Mid Day Meal Scheme (MDMS) from 2021-22, with a focus

on 112 aspirational districts (those with poor socio-economic indicators). For this year, the Centre has allocated 32.8 million tonnes of rice for PDS, MDMS and the ICDS Scheme, under the National Food Security Act, 2013. But providing all of it as fortified rice by 2024 appears to be a tall task.

Rice fortification is enrichment of the cereal with micronutrients—commonly iron, Vitamin B12 and folic acid—to provide a nutritional boost to undernourished and vulnerable populations on a mega scale across geographies. According to Food Safety and Standards Authority of India (FSSAI) norms, a kilo of fortified rice will contain 28–42.5 mg of iron, 75–125 mcg of folic acid and 0.75–1.25 mcg of Vitamin B12 (see *Super Rice*).

India bears the largest burden of iron deficiency and anaemia globally, with nearly 59 per cent of children and

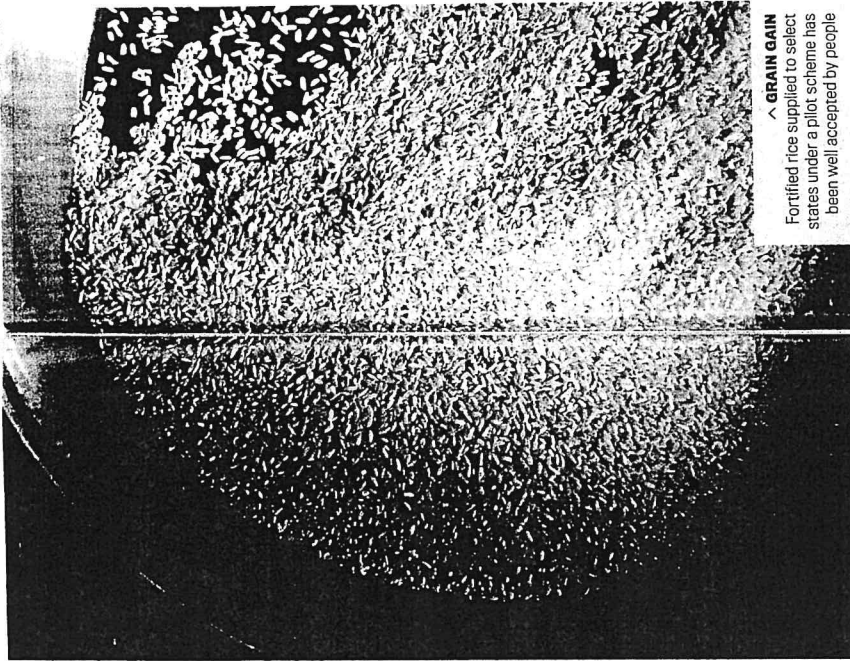
50 per cent of pregnant women anaemic, according to the National Family Health Survey (NFHS-4). Child and maternal malnutrition is responsible for 15 per cent of the country's total disease burden. The NFHS-4, conducted in 2015–2016, found the prevalence of underweight, stunted and wasted children under five years of age to be 35.7, 38.4 and 21 per cent, respectively.

The Union government believes rice fortification is the panacea for malnutrition and has been working on ironing out supply chain and other logistical issues in consultation with the NITI Aayog, FSSAI and non-governmental stakeholders such as Tata Trusts, World Food Programme, PATH and Nutrition International. India produces over a fifth of the world's rice. At a per capita consumption of 6.8 kilos a month, the country is the largest consumer of rice. Rice fortification has been under-

**32.8**  
MILLION TONNES  
Centre's rice allocation for 2021-22 under PDS, MDMS and ICDS Scheme

**350,000**  
TONNES  
Fortified rice kernels required to cover PDS across the country in 2024

**28,000**  
RICE MILLERS  
need to be equipped by FCI for supplying fortified rice



▲ **GRAIN GAIN**  
Fortified rice supplied to select states under a pilot scheme has been well accepted by people

way as a pilot scheme (one district per state) since 2019–20 in Andhra Pradesh, Maharashtra, Odisha, Uttar Pradesh, Gujarat, Tamil Nadu and Chhattisgarh, with plans to extend this to Madhya Pradesh, Telangana, Uttarakhand, Kerala and Jharkhand. Preliminary data suggests that fortified rice is well accepted by the beneficiaries.

Fortification is meant to improve the nutritional quality of food to bring health benefits to people with minimal risks. For this, food additives need to be used in permitted quantities. For example, iodised salt, introduced in 1962 to tackle goitre, has had wide acceptance in the country. However, expert opinion is divided on the health benefits of fortified rice.

## DOES FORTIFIED RICE WORK?

Public health experts say food fortification is one of the most sustainable strategies to address micronutrient deficiencies in people. Not only is it cost-effective, scientifically proven and globally recognised, supplies to the targeted populations can be easily ensured through the ongoing food delivery schemes. Rice has the highest uptake in government food security programmes, such as PDS, ICDS Scheme and MDMS, potentially making it an ideal choice for fortification. It can help tackle the micronutrient deficiencies ('hidden hunger') that endanger the health of vulnerable sections of the population.

Women of reproductive age, children and adolescents are the most vulnerable. "Fortified rice can provide 30–50 per cent (RDA) of iron that adults need daily, based on average Indian consumption", says Mini Varghese, country director, India, Nutrition International, one of the organisations partnering with the government on the pilot project. "Trials in a controlled setting, where 100 per cent RDA of iron was ensured, showed results within 10 months. But with fortified rice, you need a minimum of 24 months to see the impact."

Nutrition International, in collaboration with the government's Food Fortification Resource Centre (FFRC), conducted an acceptability study this February for fortified rice in three districts of Madhya Pradesh. Over 400 beneficiaries of the ICDS Scheme and MDMS were served. *Akhil* and *kheer* prepared with fortified rice.

More than 80 per cent of them liked it and over 60 per cent expressed interest in fortified rice if available through the PDS, MDMS and ICDS Scheme. Self-help groups (SHGs) in the three districts concluded that there was no visible difference between fortified rice and regular PDS rice nor any changes while washing and cooking it. "Multiple studies have shown the efficacy of fortified rice. More than 17 scientific publications in over 25 countries, including India, have demonstrated that consumption of extruded fortified rice is safe and effective in women and children. It can significantly address iron deficiency," says Varghese.

A double-blind, placebo-controlled study in September 2011 by the Hyderabad-based National Institute of Nutrition in the adjacent Raega Reddy district showed that regular intake of Micronised Ferric Pyrophosphate (MFPP) supplied through extruded fortified rice kernels reduces iron deficiency among schoolchildren. A double-blind study is a randomised trial in which neither the participants nor the experimenters know who all are part of the study.

A similar study in March 2012, conducted together by the St. John's National Academy of Health Sciences, Bengaluru, and The Micronutrient Initiative (former name of Nutrition International), indicated that anaemia caused by iron deficiency had reduced from 30 per cent to 15 per cent among children who consumed fortified rice for seven months through a school mid-day meal programme in Bengaluru. The study showed that fortified rice (at 3–5 mg Fe per 100 g) was indistinguishable from natural rice, both in cooked and uncooked forms.

"Food fortification is a good move, but there is a long way to go before the results are visible," emphasises Dr V. Prakash, president, International Union of Food Science and Technology, and former director, Central Food Technological Research Institute, Mysuru. "Rice is a staple food in many parts of India and can provide the required micronutrients on a daily basis along with other foods it is eaten with.