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**Above:** Amit Kapoor, Chair, Institute for Competitiveness, India and lecturer, Stanford University**Below:** Mukul Anand, researcher, Institute for Competitiveness, India

Enriching Rice with Essential Nutrients

ENSURING access to proper nutrition is a crucial component of public health and a fundamental role of the welfare state. In a resolute move on Independence Day 2021, Prime Minister Narendra Modi announced a strategic initiative to counter micronutrient deficiencies and malnutrition by mandating the fortification of rice across all social safety net programmes by 2024. A significant span of three years has transpired post the announcement, positioning fortified rice for distribution in every district of each state, barring those mainly reliant on wheat consumption. The principal objective is to enrich rice with essential nutrients, particularly in regions where rice serves as a dietary cornerstone, thus concurrently mitigating micronutrient deficits.

Rice, being a staple sustenance for 65 per cent of India's populace and a staple within government safety net

programmes, holds immense potential for enhancing nutrition by incorporating essential vitamins and minerals. The concept of nutrition access encapsulates various dimensions, including Accessibility, Availability, Acceptability, Affordability, Adequacy, and Awareness. Together, these aspects shape the convenience and effectiveness individuals experience when accessing and utilising these vital services.

Accessibility involves the ease of accessing a service based on its location, considering both proximity and time. India's efforts in social assistance target vulnerable segments, leveraging three existing programmes to enhance nutrition via food fortification: Public Distribution System (PDS) for 800 million individuals, PM Poshan School Lunch Programme for 118 million students, and Integrated Child Development Services (ICDS) for 110 million recipients. Integrating fortified rice into these schemes combats micronutrient deficiencies at



scale, improving accessibility. Proximity of ration shops, provision of school meals, and availability of nutrition centres enhance access. These initiatives, well-tuned at the grassroots level, exhibit India's administrative efficiency and sustainable resource use, ensuring ample service provision.

Adequacy involves optimising the structure for smooth service delivery. Af-

filiated institutions like the Department of Food and Public Distribution, state food and civil supplies departments, and district rice millers ensure streamlined service. These are backed by the FSSAI, setting food standards, and the FFRC, providing technical support and promoting awareness. This coordinated effort ensures overall service adequacy.

The acceptability of fortified rice is evident as 134 LMT (lakh metric tonne) were procured in 2022-23, with the second phase completed early, covering 269 districts. This indicates societal acceptance, supported by a pilot programme in 15 Aspirational districts and FSSAI and other studies. Gradual implementation aligned with public expectations showcases fortified rice's acceptability and value.

Affordability is essential for rice fortification's accessibility, covering service delivery costs and consumer expenses like travel. Influenced by industry complexity, supply chain, policies, and programme scale, fortification expenses range from Rs 35-40 lakh for budget-friendly extruders to Rs 13.5 crore for higher-quality versions. Extra costs for fortified rice (1-10 per cent of retail price) approximate Rs 0.45 per kilogram, contingent on added nutrients. As production expands, economies of scale can reduce costs, making rice fortification a practical solution.

However, a lack of focus dissemination of information and behavioural change renders wide-scale government interventions ineffective. For instance, the 'Anaemia Mukht Bharat' programme, ongoing since 2018-19, aims to provide iron and folic acid (IFA) supplements to pregnant women, regardless of their anaemia status, for a minimum of 180 days starting from the fourth month of pregnancy. Surprisingly, according to NFHS 5 data, less

than 50 per cent of pregnant women in 19 major states adhered to the complete course, despite the availability of tablets. This underscores the importance of raising awareness to ensure access. Awareness entails effectively conveying the goals, objectives, and vision of service policies to both consumers and stakeholders. This becomes especially crucial for marginalised communities, which might lack official communication channels. Furthermore, within the organisational structure, it's imperative to ensure that the supply side is well-informed about

tribution Department of the Ministry of Consumer Affairs has also devised a Standard Operating Procedure (SoP) to ensure adherence to Quality Assurance (QA) and Quality Control (QC) protocols during the production and distribution of fortified rice or Fortified Rice Kernels (FRKs).

The FSSAI, acting as the regulatory and licensing authority for food fortification, has formulated standards for FRK, Pre-mix, and has issued directions to all stakeholders for the immediate operationalisation of these draft standards.

While India has had tremendous success in reducing stunting and anaemia among children over the last decade, current data reveals a rise in anaemia levels among women and children in 16 of 22 states/UTs (NFHS-5) due to a lack of iron, Vitamin B12, folic acid, and other nutrients. Micronutrient deficiency is a major impediment to human capital development, labour productivity, and future social and economic growth. In this context, fortifying rice emerges as a viable, preventive, and supplemental strategy for resolving anaemia and vitamin deficiency-induced malnutrition quickly.

Staple food fortification approach was attempted by mandating iodised salt in 1962, and the CNNS Report 2016-18 quietly underscored the victory of universal salt fortification by exposing iodine as the lone exception to micronutrient deficiencies in the sample examined. We are now resolutely embarking on a journey toward becoming a healthier nation through rice fortification. The momentum for food fortification in India is gaining traction, and with unwavering commitment and continuous efforts, this strategic approach holds the potential for significant enhancement in the overall nutritional well-being of the population. **BW**



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the service's availability and its potential beneficiaries.

Ongoing efforts are being dedicated to promoting public knowledge about the nutritional advantages of fortified rice through informative campaigns, involving the Food Safety and Standards Authority of India (FSSAI), experts, and Development Partners. The number of FSSAI-notified, NABL-accredited laboratories for fortification testing has increased from 20 to 48 as of August 2021. This expansion aims to instil public confidence in the safety of fortified rice.

Additionally, the Food & Public Dis-