

The Role of the Private Sector in Rice Fortification

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Introduction

The fortification of staple foods with essential vitamins and minerals is a proven, cost-effective and sustainable intervention to prevent micronutrient malnutrition among entire populations, especially where existing food vehicles and local distribution networks are available and can be utilized. As it is the staple food for an estimated three billion people – most of whom reside in developing countries – making rice more nutritious offers a vast opportunity to improve micronutrient intakes and the health status of entire populations. However, to date rice fortification has been an underutilized public health tool, due in part to the need to ensure the slightly higher costs of rice fortification are appropriately absorbed.

Fortunately, there is broad global experience with fortification of staples such as wheat flour, maize flour, oil, and salt, and some experience in rice fortification. The knowledge gained through these is valuable for implementing and scaling up new rice fortification interventions.

The exact role and interests of the private sector in rice fortification differ based on context and the delivery model chosen. This report outlines the various private-sector actors involved in fortification, as well as the interests and role of those actors in rice fortification, and offers case studies which further illustrate what the critical role of the private sector has been in various delivery models. Together, the insights gained can help the food and nutrition community

build, improve and sustain rice fortification programs which achieve impact.

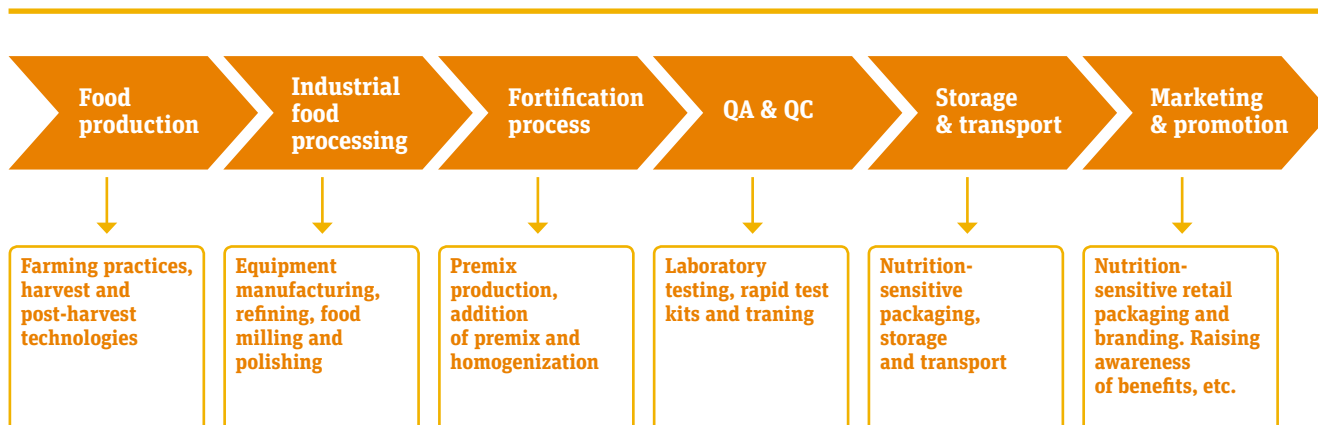
Overview of private-sector actors in fortification

Figure 1 provides a simple “fortification value chain” which outlines: **1)** food production; **2)** industrial food processing; **3)** fortification processes; **4)** quality assurance and quality control; **5)** storage and transport; and **6)** marketing and promotion. Private-sector actors playing various roles in this value chain include: the food processing/rice milling industry; equipment manufacturers; manufacturers and suppliers of vitamins and minerals/multimicronutrient premixes; private food laboratories; and retail organizations (including cooperatives, where these exist).

Addressing the interests of the private sector in fortification

Fortification programs are most successful when driven by partnerships and trust between the public- and private-sector actors as outlined above, with a final public health objective. All actors should collaborate to create an enabling environment for rice fortification, with each stakeholder contributing their individual expertise and sphere of influence. This includes an appreciation and recognition of the important social benefits as well as the economic incentives required to deliver successful and sustainable fortification programming. The public health justifications for food fortification are widely accepted by the public sector, which has a key role to create the legislation and/or standards which support appropriate regulations for rice fortification and to establish clear rules which ensure the public interest.²

Because the private sector is the one undertaking the actual fortification processes, its motivation and interests require a special focus, including the need to see profitability as markets expand, to enhance brand value through improving nutritional content, and to help ensure fortified foods develop a healthy and productive labor force in low-income communities. This ongoing motivation is critical to the success of national, re-

FIGURE 1: Food fortification value chain

gional and global rice fortification efforts – during all phases of the project life cycle – including the “build” phase, when conducting rice landscape analyses to assess feasibility and when selecting points for blending and other critical milestones along the rice fortification value chain.

“There are various tools and guidelines available to help ensure public-private partnerships for nutrition and fortification are set up for success”

There are various tools and guidelines available to help ensure public-private partnerships for nutrition and fortification are set up for success so that these public and private interests are adequately addressed. These include: the 2009 Guidelines on Cooperation between the UN and the Business Sector;³ the 2013 WFP Guidelines for Private-Sector Partnerships;⁴ and the 2015 WHO Consultation Paper on Conflicts of Interest in Nutrition.² The Scaling up Nutrition Movement (SUN) hosts a Business Network which can help private-sector actors to become more engaged in the planning phases of fortification (see **Box 1**). It has produced a guide outlining how businesses can engage more effectively in nutrition programming.⁵

The private sector and delivery models for rice fortification

There are typically three different delivery options from which to choose when looking to roll out rice fortification programs, and each of these influences the role of the private sector: **1)** national, mandatory rice fortification; **2)** voluntary rice fortification, also referred to as commercial rice fortification; and **3)** distribution of fortified rice through social safety nets.

BOX 1: Opportunities to help engage the private sector in rice fortification

Today, 58 countries are actively engaged in the Scaling Up Nutrition (SUN) Movement – an effort which unites all stakeholders, including businesses, in a collective effort to improve nutrition.

SUN Countries in Latin America include Costa Rica, El Salvador, Guatemala, Haiti and Peru. In Colombia, the SUN Business Network (SBN) has partnered with a national business alliance for nutrition.

The role of the SBN is to engage companies, in partnership with the public sector and civil society, to create value for society through developing and producing nutritious products, and fostering demand for more nutritious foods, as well as delivering nutritious products and services to vulnerable populations at scale.

The network has seen rapidly growing engagement. Today, over 300 companies have joined the SBN and 23 SUN Countries have established, or are establishing, national SBNs. These national networks establish a consensus with government on where the private sector can best support national nutrition strategies, develop roadmaps for action and investment with business, and aim to establish partnerships and investments that will support business to mobilize greater action and investment in nutrition.

Of the 32 SUN Countries surveyed, fortification is one of the top two areas where governments are seeking greater

engagement from business and are seeking advice and guidance on best practice through the SBN. There are opportunities to promote rice fortification with the private sector through the SBN, including:

- Work with the global SBN team to identify which SUN Countries would benefit from developing rice fortification programs – and establish a strategy to engage national stakeholders through the national SUN structures;
- Disseminate best practice to national SBNs through the SBN global team; and
- Use the SBN's national membership platforms to reach out to business.

The SBN is co-convened at the global level by the Global Alliance for Improved Nutrition (GAIN) and the UN World Food Programme (WFP).

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Important considerations for selecting a delivery option include defining who covers the majority of the costs. Start-up costs for equipment notwithstanding, the core cost of rice fortification is the production of the fortified kernels, of which the price of raw materials in the form of premix and rice flour (broken rice) are key cost components. It is important to consider how this core cost will be covered when selecting a delivery model (e.g., by government, donor, market/consumer or other means). For example, in voluntary fortification, the role of the private sector in ensuring that costs are covered by the market shifts considerably vis-à-vis demand creation and marketing in comparison to mandatory fortification or distribution through the social safety net. In addition to costs, the structure of the rice industry and the degree of centralization among rice processors and distribution channels are also important considerations when designing large-scale rice fortification programs and selecting a delivery model.

Delivery model 1:

Mandatory fortification and the private sector

Mandatory fortification typically requires food producers to fortify both domestically produced and imported staple foods with specified micronutrients. Governments tend to mandate

BOX 2: The private sector in Costa Rica's successful mandatory rice fortification program

The Costa Rican mandatory rice fortification program has contributed to a reduction in folate deficiency and anemia among the population at large, and has led to reductions of neural tube birth defects and the infant mortality rate.

Background

Rice is the most important product in the Costa Rican food basket. This staple food is consumed in all three daily meals, and per capita consumption of rice is one of the highest in the region. The 1996 National Nutrition Survey showed a need for more essential vitamins and minerals in the country. It should be noted that rice is the only food product for which the price is regulated by the Government. Also because the rice industry is quite consolidated, mandatory rice fortification was more feasible.

Therefore, the Ministry of Health (MOH) decided it was vital that all rice in the country should be fortified. Through Executive Order No. 30031-S, the Presidency of the Republic and the MOH made the “Regulations for the Enrichment of Rice” official, which is used for all rice direct for human consumption in the country, whether of domestic production, donated or imported. Chapter II, Article 3, of that regulation states that “milled rice used for direct human consumption should be fortified with folic acid, vitamin B complex, vitamin E, selenium and zinc.”

The development of this order was done in a step-wise fashion. The MOH had previous experience in the fortification of other foods, and the National Commission on Micronutrients (or CONAMI, the acronym in Spanish) was already established. The CONAMI, in conjunction with the National Association of Rice Producers (ANINSA), which represents 100% of rice mills in the country, held several deliberations to support the design of the fortification program. Technical and scientific studies were carried out early on between the public and private sector that facilitated decision-making. Following fortification trials, the cost of fortification was included in the fixed price of rice set by the government. The total extra cost of fortified rice is less than 1% of the cost of non-fortified rice.

The success of this mandatory rice fortification program was due to strong private-sector engagement from the start, in partnership with government.

Quality assurance or internal control of fortified rice is the responsibility of the producers and rice importers. Importers must show a certificate proving that the product complies with all specifications. Quality control and monitoring of rice fortification is the responsibility of the Ministry of Health at the final point of sale to the consumer.

fortification when micronutrient deficiencies are widespread, and when there is a suitable food vehicle that is consumed in sufficient quantities by most of the population.^{6,7,8} Mandatory fortification requires government will and leadership to create the necessary legislation and monitoring system in order to enforce legislation.⁹

Experience shows that mandatory fortification has the greatest potential for health impact due to the fact that it creates necessary demand and can “level the playing field,” providing assurance to rice millers that competitors are held to the same requirements, incur the same core costs, and will not be disadvantaged.^{1,10} The degree of industry consolidation, size and modernization also contributes to the eventual coverage of the mandated program. Decentralized milling environments face both logistical and quality assurance challenges. The South and Central American regions, which have seen rapid centralization of the rice processing industry, arguably have a more conducive industry structure for implementing national-scale, mandatory rice fortification. Costa Rica has had much success in mandating rice fortification (**Box 2**).

Delivery model 2: Voluntary, market-driven rice fortification and the private sector

Given the barriers to mandatory fortification in many contexts, voluntary market-based approaches are often considered. Fortification is voluntary when the private food industry has the option to fortify its products. It is a business-orientated approach, with rice products marketed as “value-added” products. In countries like Colombia,¹¹ Brazil (**Box 3**)^{12,13,14} and Dominican Republic, large rice millers have successfully pioneered rice fortification voluntarily, launching fortified rice products which improve consumer perception of a company’s brand while providing better nutrition to consumers. However, due to slow build-up of consumer demand, especially among poorer populations, the potential for going to scale and influencing a population’s micronutrient health may be limited. Voluntary approaches to rice fortification have not yet been systematically evaluated to see if health impact has been achieved.

In a voluntary commercial approach, an ecosystem comprising a category brand, a quality management system, social marketing and a governance framework are instrumental.

BOX 3: A voluntary approach to fortification in Brazil

“Magic rice,” a nickname given by Mauricio de Sousa (creator of Mônica, the beloved Brazilian national cartoon character) or *arroz vitaminado* (meaning “vitamin rice”) is fortified with vitamin B₁, folic acid, iron, and zinc. The result of more than 15 years of work, *arroz vitaminado* uses technology developed by PATH, funded by the Bill & Melinda Gates Foundation, and brought to market in partnership with GAIN through a pilot project which ended in 2015.

The aim was to develop a replicable model to scale up rice fortification through commercial channels. The project demonstrated the feasibility of introducing a fortified rice product to the market through a vertically integrated model and reached over 2.5 million consumers, 460,000 of whom were repeat consumers. Some of the lessons learned are discussed below.

Given the barriers to mandatory rice fortification, the pilot model was based on vertical integration, enabling a few upstream rice kernel producers to supply fortified kernels to numerous rice millers. Millers, who generally own the rice brands in Brazil, could then in turn blend the kernels with unfortified rice to market fortified rice to consumers.

Research showed that pricing was not a major barrier to commercializing rice, and should be driven by market forces. Fortified rice was on average 40% less expensive than the average rice of non-fortified rice, when including premium brands. Research showed that only one in five rice consumers has price as the top decision-driver. This environment allowed for the modestly higher costs brought by fortification to be absorbed by producers, retailers, and consumers.

Although the business model tested in this pilot offered an attractive business proposition to the fortified kernel supplier, it also created conflicts of interest for other millers, who felt discouraged to source from a competitor. Creating disincentives for other players to join the market risks generating a monopolistic situation and limits market growth. Program design should be based on careful microeconomic analysis and as far as possible avoid creating conditions that do not favor a competitive marketplace.

In Brazil, fortified rice has become a niche market that represents a single-digit percentage of the overall rice market and may demonstrate that a purely commercial model for

fortified rice is not sufficient to reach meaningful scale and significant public health impact. Public-sector engagement is essential to de-risk fortification and level the playing field in rice fortification programs.



Smiling child, Guatemala 2012

These can help build trust in the positioning and messaging of fortified rice as beneficial to family health, establish a unique, common and visual identifier across fortified rice products represented by a logo, and boost the perceived value of the category, which would increase consumer willingness to pay the premiums for fortification.

“The distribution of fortified rice through social safety nets is seen as an effective delivery option”

Delivery model 3: Social safety nets and the private sector

The distribution of fortified rice through social safety nets is seen as an effective delivery option, especially when mandatory national rice fortification is not feasible due to a fragmented rice milling landscape with many small-scale millers, and policy-makers want to ensure that more vulnerable populations are covered. Furthermore, social safety net programs can have a catalytic effect on voluntary rice fortification efforts. The deci-

BOX 4: Fortified rice for social safety nets in India and the private sector

In India, the public distribution of fortified rice has shown the promise of having a positive public health impact. After two local efficacy studies on the impact of fortified rice on micronutrient status in schoolchildren, a consortium of organizations conducted the first large-scale rice fortification trial in Odisha state, India. A baseline study among schoolchildren aged six to 14 years in Gajapati district (district in South Odisha) found that 19% of the sampled children were stunted (low height-for-age) and 14.5% were wasted (low weight-for-height). The survey revealed that 73% of the boys and 74% of the girls from primary school were affected by anemia.

After the baseline survey, a rice fortification trial started in April 2013 to evaluate the impact of a lunch meal with iron-fortified rice as part of the midday-meal program in Gajapati six times a week. The key objective of the project was to reduce the level of anemia in schoolchildren (by 5%), and establish a sustainable supply chain to fortify the rice in the school meal that can be scaled up in the state of Odisha.

The program reached over 100,000 children with iron-fortified rice. Part of the program was communication on the importance of a diverse diet, good sanitation and healthy nutrition (audience: schoolchildren, teachers, school management boards). The project was implemented by a consortium of stakeholders, including the Government of Odisha, WFP, PEACE (local NGO), SGS (laboratory), rice processing unit SSRM, and evaluating agency SAMBODHI. WFP provided technical support, managed the fortified rice supply chain, and had a coordinating role with the numerous stakeholders. Domestic production of the fortified kernels was a prerequisite of the government to move forward with the program. The NGO PATH was instrumental in ensuring extruded fortified kernels were produced domestically by transferring technical expertise and providing training to a large miller in Andhra Pradesh to produce the fortified kernels.

The set objectives were met, as the rice fortification overall program managed to reduce the prevalence of anemia by 20%, of which 6% could be attributed to the consumption of fortified rice as part of the midday meal.

Some of the challenges and insights included: 1) at the

start there was only one fortified-kernel producer, which was located in a different state – causing pipeline difficulties and near breaks; **2)** batch blending instead of continuous blending of the fortified kernels into the rice, which is labor-intensive and prone to quality issues due to shorter mixing times, caused by capacity limitations; and **3)** success of combining the program with nutritional awareness, including rice bags with messages on the importance of good nutrition that served as a school poster and a pot to grow vegetables in for a more diverse diet.

Because of the positive outcomes, Odisha state government decided to scale up the rice fortification to other districts and introduce multimicronutrient fortification. In addition, other states started projects to implement fortified rice in Public Distribution System (PDS) and Mid-Day Meal (MDM) programs.

In October 2016, the Food Safety and Standards Authority of India (FSSAI) published for the first time rice fortification guidelines for India. Furthermore, additional fortified kernel producers came on stream during 2016 that are interested in supplying the fortified kernels for the social safety net programs, as well as in launching branded fortified rice. All very promising developments after the start of introducing fortified rice successfully in the MDM program.

sion to fortify the rice distributed through social safety net programs is often made through a policy decision by government, UN agency, nongovernmental organization (NGO), or private entity, which normally also bears the costs of fortification, with zero or limited support from donor funding. **Box 4** provides an example on fortified rice for social safety nets in India.

Conclusion

While rice fortification has been an underutilized public health tool to date, the successes outlined in this paper provide important insights into how to ensure the role and interests of the private sector are leveraged appropriately vis-à-vis various delivery models, and that costs are appropriately absorbed. Mandatory rice fortification presents the best means of reaching a high coverage of population, but requires strong public-private partnerships and sustained commitments. Voluntary and market-driven approaches have seen traction, but strong consumer demand as well as government buy-in is crucial to achieve meaningful scale. Social safety net programs are an ideal platform for key partners to collaborate to bring fortified rice to vulnerable groups, and can build sufficient institutional

demand to help ensure the financial viability of rice fortification. All three models require a firm commitment from the private sector and its engagement from start to finish of the project life cycle. Together, these insights can help the food and nutrition community build, improve and sustain rice fortification programs which achieve impact.

References

1. Allen L, de Benoist B, Dary O et al, eds. Guidelines on food fortification with micronutrients. World Health Organization and Food and Agriculture Organization of the United Nations: Geneva, 2006.
2. World Health Organization. Addressing and managing conflicts of interest in the planning and delivery of nutrition programs at country level. Report of a technical consultation convened in Geneva, Switzerland, on 8–9 October 2015. ISBN 978 92 4 151053 0.
3. United Nations. Guidelines on Cooperation between the United Nations and the Business Sector. United Nations: Geneva, 2009.
4. World Food Programme. WFP Private-sector partnerships and fundraising strategy (2013-2017). Rome: WFP, 2013.
5. The Scaling Up Nutrition Business Network. Guide to business engagement for SUN countries. 2016 Aug.
6. Bishai D, Nalubola R. The history of food fortification in the United States: its relevance for current fortification efforts in developing countries. *Econ Dev Cult Change*. 2002;51(1):37–53.
7. Fletcher RJ, Bell IP, Lambert JP. Public health aspects of food fortification: a question of balance. *Proc Nutr Soc* 2004;63(4):605–14.
8. Greiner T. Fortification of processed cereals should be mandatory. *Lancet* 2007;369(9575):1766–8.
9. Luthringer CL, Rowe LA, Vossenaar M et al. Regulatory monitoring of fortified foods: identifying barriers and good practices. *Glob Health Sci Pract* 2015;3(3):446–461.
10. Mannar MG, Van Amerigen M. Role of public-private partnership in micronutrient food fortification. *Food Nutr Bull* 2003;24(4):S151–4.
11. Tsang BL, Moreno R, Dabestani N et al. Public and private sector dynamics in scaling up rice fortification: the Colombian experience and its lessons. *Food Nutr Bull* 2016; DOI: 10.1177/0379572116664897.
12. Manus C, Peiman M, Wolfson J. Marketing for Health. SSIR 2015.
13. Milani P, Spohrer R, Garrett G et al. Piloting a commercial model for fortified rice. *Food Nutr Bull* 2016; DOI: 10.1177/03795721166648447.
14. Milani P, Carnahan E, Kapoor S et al. Social marketing of a fortified staple food at scale: generating demand for fortified rice in Brazil. *J Food Prod Market* 2017; DOI: 10.1080/10454446.2016.1266546.