Rice Fortification

WFP Myanmar

Introduction to Rice Fortification

Rice fortification is the enrichment of rice with essential vitamins and minerals post-harvesting to increase its nutritional value. Current available technology can produce fortified rice that is safe, and that looks, tastes and can be prepared the same as non-fortified rice. Consumption of fortified rice increases micro-nutrient intake without requiring consumers to change their buying, preparation or cooking practices. Rice fortification is similar to the fortification of wheat and maize flour or salt, all of which have been proven effective at a large scale and are recommended by the World Health Organization (WHO).

WFP and rice fortification

WFP is committed to support efforts that ensure that every man, women and child enjoy their right to adequate food. Therefore, WFP is dedicated to support rice fortification as one important and effective approach to improve access to adequate food for all. WFP has in-house technical expertise on rice fortification and has been closely involved in introducing and supporting rice fortification in other Asian countries, such as India, Cambodia and Bangladesh. In those countries, WFP works closely with the national Government and relevant stakeholders to strategically and effectively introduce fortified rice. Ensuring sustainable production of fortified rice requires a multi-stakeholder and multi-dimensional approach. Various ministries, private-sector organizations, donors and technical partners each play an important part. Furthermore, the technical, political and business aspects need to be addressed in a comprehensive way. Leadership, ownership and partnerships can be steadily built, while technical issues are addressed and commercial opportunities are utilized. Given the positive experience in other countries, WFP is committed to be a key technical partner in the introduction and eventually scaling up of fortified rice in Myanmar as well.

Coverage

To achieve the full potential of rice fortification as a cost-effective intervention for addressing widespread micro-nutrient deficiencies, it must be feasible to fortify a large proportion of the rice supply, especially the rice consumed by those who can most benefit from its consumption.

Micro-nutrients include vitamins and minerals which each have a specific role in the functioning and processes in our body, such as supporting the nervous system, eye functioning, metabolism, growth or brain functioning.

Landscape analysis for rice fortification

Rice fortification can have a significant public health impact, particularly in a context where rice is a staple food and micro-nutrient deficiencies are widespread. To realize this potential, however, it must be feasible to fortify a large proportion of the rice consumed. It is especially important to fortify the rice consumed by the populations who can most benefit from its consumption. To achieve the full potential of rice fortification, it is important to assess factors which will influence feasibility, sustainability, and potential public health impact. Feasibility and sustainability of rice fortification depends on the structure and capacity of the rice milling industry, the available distribution channels, rice consumptions patterns, consumer preferences, market size, rice supply chain, and the policy and regulatory environment. To assess these factors, WFP promotes conducting a rice landscape analysis in the initial stages of introducing rice fortification. The rice landscape analysis can be used to determine: how to integrate fortified kernel production and blending into the rice supply chain, the most appropriate delivery options, which stakeholders to engage and how to adapt the regulatory and policy environment.

Hidden hunger

Globally, more than two billion people are affected by micro-nutrient deficiencies, also known as hidden hunger. Micro-nutrient deficiencies, defined as the lack of one or more of the essential vitamins and minerals required for healthy growth, development and functioning, affect all ages and socio-economic groups. Micro-nutrient deficiencies occur when a diverse and nutrient-rich diet (one that includes animal-source foods such as meat, eggs, fish, dairy, as well as legumes, cereals, fruits and vegetables) is neither consistently available nor consumed in sufficient quantities. In addition, gut inflammation and illnesses such as diarrhea, malaria, helminthiasis (worms), TB or HIV/AIDS affect a person's ability to absorb micro-nutrients and can lead to deficiencies. In low- and middle-income countries multiple micro-nutrient deficiencies tend to co-exist, as they share common causes.

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Myanmar Context

In Myanmar, many people predominantly eat milled rice and a limited variety of other foods, which leads to insufficient consumption of nutritious foods needed to lead a healthy and active life. Milled rice is a good source of energy, but a poor source of micro-nutrients. In addition, consumption of meat, eggs, dairy, vegetables and fruits is also low in general and highly depending on seasonality. Therefore, there is a high need to improve local production and availability of year-round nutritious foods. Pregnant, lactating mothers and young children need even more (micro) nutrients than average to support the growth and development of the fetus/child. Lack of these necessary nutrients causes disability and, in case of severe deficiency, even death of these children. The Myanmar under 5 mortality rate has decreased substantially over the past decades but is still high at 51 children dying per every 1,000 live births, ranking Myanmar at a 50th place out of 195 countries worldwide (State of the World Children 2015 - UNICEF). With the Myanmar population relying on rice as their staple food, rice fortification offers a unique opportunity to substantially improve nutrition and health status of a large number of people at very low cost. At the same time, it is important to keep in mind that rice fortification cannot eliminate all micronutrient deficiencies. Therefore, it should be part of a more comprehensive strategy to address micro-nutrient deficiencies.

Fortified white rice versus brown or parboiled rice

Fortified white rice can have a significantly higher micronutrient content than non-fortified rice, including brown or parboiled rice. White rice is widely consumed, while brown/parboiled rice is rare and thus, would require a change in existing behavior.

Target populations for rice fortification

The potential for individuals to benefit from rice fortification varies across the course of a lifetime, and depends on the micronutrient requirements, dietary intake, the mount of rice consumed, and the potential of fortified rice to fill micronutrient gaps. For example, women of reproductive age (19 to 45 year old) have moderate to high micronutrient requirements and consume a significant amount of rice. Therefore, they are likely to consume a sufficient quantity of fortified rice to meet their micronutrient needs. However, pregnant women have increased micronutrient needs. Although the fortified rice they consume will help meet these needs, it is unlikely to fully meet them. Therefore, other interventions such as iron/folate multiple micronutrient supplementation will still be required. Young children aged 6 to 23 months, likewise, have relatively high micronutrient needs, yet consume only small quantities of rice. Therefore, fortified rice will not be sufficient to fill their micronutrient gap.

Rice fortification or bio-fortification?

In rice fortification, micronutrients are added *after* the rice has been harvested. In bio-fortification the micronutrient content is increased through breeding or genetic modification (GM) and thus occurs *before* harvesting the crop. Only a limited number of nutrients can be added so far through bio-fortification. In addition, the levels of nutrients that are added to rice can be much higher with fortification than with bio-fortification.

Is rice fortification safe?

The fortification of staple foods and condiments – a strategy used for more than 90 years – has been proven safe and effective in significantly contributing to the reduction of micronutrient deficiencies. As with other food fortification, rice fortification is safe because the type and levels of micronutrients added are calculated based on: (1) the recommended daily intake of specific micronutrients by age group and gender, (2) the highest level of intake that poses no risks in an age and gender group, (3) the level of specific micronutrients typically consumed by the target population, and (4) the daily/regular quantity of rice consumed by the target population. This information is used to calculate the gap between the micronutrients consumed and the micronutrients required by specific groups. This gap is used to determine which and how much of specific micronutrients will be included in the rice.

Based on 15 countries, of which four in Asia, the increased costs to fortify rice is between 1 to 10 percent.

Conclusion

The number of countries introducing rice fortification is growing, with Asian and Latin American countries spearheading the effort. Fortifying rice, a staple food for more than three billion people globally, has the potential to improve population health, increase productivity and promote economic development. Rice fortification has benefitted from the experience of wheat and maize flour fortification. The evolution of cost-effective technologies, combined with data on effective nutrient fortification levels, makes rice fortification safe, feasible, effective, and sustainable. Strong advocacy is needed to further drive the public-private partnerships and the government mandates that help ensure long-term success. The potential impact of improving micronutrient health in Asia and beyond is vast. The time is right – there is great momentum to move forward with rice fortification from a growing number of governments, private sector leaders, and key global health organizations. Asia can seize the momentum and lead the way in building effective and sustainable rice fortification programs.

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