Introducing Fortified Rice through Public and Private Sector: Global Experience and the Way Forward

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Outline

• Micronutrient malnutrition

• Rice fortification

• Global experience on introducing fortified rice through public and private sector

• Way forward
MICRONUTRIENT MALNUTRITION
MICRONUTRIENT DEFICIENCIES PLACE A HEAVY BURDEN ON THE HEALTH AND ECONOMY OF NATIONS

2 billion
People worldwide suffering from micronutrient deficiencies

136,000
Yearly deaths of women and children due to iron-deficiency anemia

190 million
Preschoolers affected by vitamin A deficiency

300,000
Global birth defects due to maternal folate deficiency

1.1 million
Yearly deaths due to vitamin A and zinc deficiencies

45%
Child deaths caused by undernutrition

-11%
Gross Domestic Product (GDP) lost in Asia and Africa as a result of undernutrition

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Prof Robert E Black MD, Prof Cesar G Victora MD, Prof Susan P Walker PhD, Prof Zulfiqar A Bhutta PhD, Prof Parul Christian DrPH, Mercedes de Onis MD, Prof Majid Ezzati PhD, Prof Sally Grantham-McGregor FRCP, Prof Joanne Katz ScD, Prof Reynaldo Martorell PhD, Prof Ricardo Uauy PhD, the Maternal and Child Nutrition Study Group. Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet.* 3 August 2013; Vol. 382, Issue 9890: Pages 427-451.

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Ending Undernutrition: Our Legacy to the Post 2015 Generation. Lawrence Haddad, IDS in partnership with the Children’s Investment Fund Foundation.
Micronutrient malnutrition – India

75%  Prevalence of Iron Deficiency Anaemia (IDA) in children < 5 years

55%  Prevalence of IDA in women (15 – 49 yrs old)

22,000  Maternal deaths due to severe anemia (Annual)

57%  Children < 5 yrs with sub-clinical vitamin A deficiency

26%  Population at risk of inadequate zinc intake

43%  Stunting in children < 5 years of age

50,000  Neural tube birth defects (annual)

Addressing micronutrient malnutrition requires an integrated strategy that includes fortification.

<table>
<thead>
<tr>
<th></th>
<th>Diet Diversification</th>
<th>Supplements/ Micronutrient Powders</th>
<th>Fortification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>Long term</td>
<td>Short term</td>
<td>Medium term</td>
</tr>
<tr>
<td><strong>Change of Habits/ Compliance</strong></td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
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Food fortification provides a population-based safety net against micronutrient malnutrition especially relevant to children and women of reproductive age.
RICE FORTIFICATION
Rice is an ideal fortification vehicle at the heart of a key value chain in many developing economies

- Staple food for over 2 billion people
- Staple food for 65% of Indian population
- Largest source of calories in many developing countries
- Core component of agriculture and nutrition in most of Africa and Asia
- Important element of many food security initiatives
## Understanding rice fortification: a few key terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Fortificant</td>
<td>Selected micronutrient in a particular form to fortify selected food (e.g., rice, flour, salt)</td>
</tr>
<tr>
<td>Fortificant mix (premix)</td>
<td>Blend that contains several fortificants (vitamins and minerals)</td>
</tr>
<tr>
<td>Fortified kernels</td>
<td>Rice-shaped kernels fortified with the fortificant mix</td>
</tr>
<tr>
<td>Fortified rice</td>
<td>Non-fortified rice blended with the fortified kernels (at 0.5 – 2% ratio; typically 1%)</td>
</tr>
</tbody>
</table>
The process to fortify rice comprises two main steps

- **Fortifying rice**: making rice more nutritious by adding essential vitamins and minerals

- Fortifying rice is a **two-step process**:

- Low cost high quality production facility (Usher Agro ltd) for producing fortified rice enabled in India
Rice fortification has come a long way since the 1930s.
GLOBAL EXPERIENCE INTRODUCING FORTIFIED RICE THROUGH PUBLIC AND PRIVATE SECTOR
FORTIFIED RICE DELIVERY OPTIONS

- Mandatory
- Voluntary
- Social safety nets
# Current Status of Mandatory Rice Fortification

<table>
<thead>
<tr>
<th>Country</th>
<th>Legislation year</th>
<th>Rice Source, Fortified Kernel Source &amp; Milling Industry</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costa Rica</td>
<td>2001</td>
<td>40% imported; 2 domestic fortified kernel producers; 11 mills</td>
<td>100% fortified</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>2009</td>
<td>80% rice domestically grown; 40+ mills, many small</td>
<td>Limited implementation</td>
</tr>
<tr>
<td>Panama</td>
<td>2009</td>
<td>40% rice imported; initial plan for government to pay for kernels</td>
<td>Not being implemented yet</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>2007</td>
<td>All rice imported; fortified with imported kernels or in country of origin</td>
<td>At least 80% fortified (market share of largest importer)</td>
</tr>
<tr>
<td>Philippines</td>
<td>2001</td>
<td>Fortified kernels imported plus 3 domestic producers. SSN rice 13% imported; ~11,000 mills.</td>
<td>1-2% total rice fortified 2006-2013. Currently &lt;1%</td>
</tr>
<tr>
<td>Country</td>
<td>Start Year</td>
<td>Rice, Kernel Source &amp; Milling Industry</td>
<td>Implementation</td>
</tr>
<tr>
<td>--------------------</td>
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<td>--------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Brazil</td>
<td>2006</td>
<td>0 imports; 2 domestic producers of kernels; multiple rice millers</td>
<td>About 1-2% coverage</td>
</tr>
<tr>
<td>Colombia</td>
<td>2002</td>
<td>20% rice imported; rice is sprayed with vitamins; &lt;100 millers; ~7 have ~75% market share</td>
<td>Several brands fortifying; about 50% total rice</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>2011</td>
<td>3% imported; unknown kernel source; assume multiple rice millers</td>
<td>Unknown</td>
</tr>
<tr>
<td>South Africa</td>
<td>2011-2014</td>
<td>100% imported rice; imported fortified kernels; multiple large mills</td>
<td>1 brand fortifying about 4% of total rice</td>
</tr>
<tr>
<td>USA</td>
<td>1998</td>
<td>21% imported; multiple large millers</td>
<td>About 90% coverage Mandatory in 6 states</td>
</tr>
</tbody>
</table>
CURRENT STATUS OF SOCIAL SAFETY NET RICE FORTIFICATION

- Bangladesh
  - Government programmes: Vulnerable Group Feeding/Development
  - WFP school feeding
  - Garment factory rice ration for workers

- Indonesia: RASKIN rice for the poor (pilot)

- Philippines: National Food Authority sells lower grade subsidised rice, intended for poor

- School feeding programme in India
Strategies for public and private sector introduction and scale up of fortified rice rests on four pillars

- Supply chain
- Distribution channels
- Advocacy
- Demand generation
Enabling technologies to ensure quality across the fortified rice supply chain

Low-cost extrusion technologies

Rice-shaped fortified grains

Blending technologies

Fortified grains

Milled rice

High-quality fortified rice

Verify micronutrient content

Validate appropriate blend ratio (1-5%)

Quality-control tools
Introducing fortified rice in India through the public-sector

World Food Programme distributing fortified rice through the Mid-day Meal Program in Gajapati district of Odisha reaching 98,000 children.

WFP pilot and Usher production facility showcased as top innovation in leading English news channel.
Introducing fortified rice in India through the public-sector: New Initiative

- Introducing fortified rice in the MDM program through Akshaya Patra kitchen in Karnataka

- Reaching 450,000 thousand children in 2600 schools

- Integrating WASH and de-worming intervention with fortified rice feeding

- Scaling up WFP implemented fortified rice feeding program by the government of Odisha through the MDM program into additional districts
Bringing together nutritional and economic impact in Myanmar

**Purpose:** To reduce micronutrient deficiencies in the population while creating income-generation opportunities for supply-chain and distribution actors through the introduction of fortified rice in Myanmar

**Project goals**

- 500,000+ fortified rice consumers (population-based approach)
- Reduced select micronutrient deficiencies
- 29 local supply chain and distribution actors (70%+ with increased income)
Leveraging public-private partnerships to scale up rice fortification in Brazil

Federal University of Viçosa (UFV)
Center of Excellence in Food Fortification

Technical support

Fortified grain producers

Other companies

Fortified grains

Millers

Other millers

Commercial products

Quality verification

Brazilian rice miller association
Leveraging public-private partnerships to scale up rice fortification in Brazil (cont.)

- Millers
  - Commercial products
  - Other millers
- Retail
  - National chains
  - Regional chains
  - Distributors
- Public Sector
  - School lunches
  - Other programs
- Exports
  - Africa
  - Latin America
- Consumers
Social marketing is essential for scale up in non-mandated environments like Brazil and Myanmar

Hundreds of thousands of households in Brazil reached through a strategic social marketing campaign

- Developed fortified rice as a category brand
- Partnered with the “Brazilian Walt Disney” and his iconic characters
- Promoting nutrition education through traditional and social media
WAY FORWARD
KEY STRATEGIES TO SCALE-UP RICE FORTIFICATION

• Working with local food regulatory agencies to ensure appropriate standards/guidelines

• Identify key delivery channels for fortified rice

• Local capacity building

• Advocacy
KEY STRATEGIES TO SCALE-UP RICE FORTIFICATION: POLICY CONSIDERATIONS

- Mandatory rice fortification offers the best opportunity for achieving high coverage and a public health benefit

- Voluntary rice fortification has only achieved high coverage in special circumstances

- Social safety nets that distribute rice provide an excellent opportunity to reach vulnerable groups with fortified rice

- However considerations of feasibility of implementation are important for both mandatory and social safety
RICE FORTIFICATION IS READY FOR A QUANTUM LEAP IN SCOPE AND IMPACT
Thank you