

Introduction to micronutrient fortified rice

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ILSI and ILSI Japan

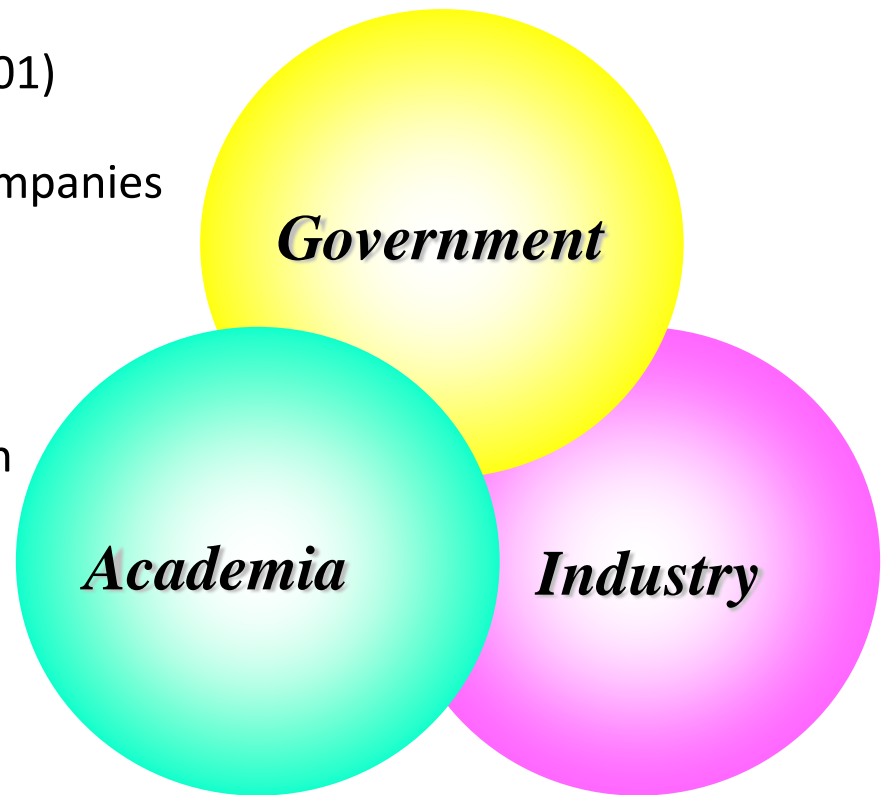
International Life Sciences Institute Japan

- ILSI: Founded in 1978 (Washington, D.C.)
- Nonprofit, worldwide organization
- 17 Regional branches

- ILSI Japan: Funded in 1981 (NPO in 2001)
- Supporting companies: 63
food, pharmaceutical and chemical companies

- Four thematic areas provide focus:
 - Nutrition, health and well-being
 - Food and water safety
 - Sustainable agriculture and nutrition security
 - Toxicology and risk science

- Scientists from:
 - Academia
 - Government
 - Industries



gather in a neutral forum to advance scientific understanding

ILSI **PROJECT** IDEA

Iron Deficiency Elimination Action

- Began in 1997 as a focused effort to reduce the global problem of iron deficiency through food fortification
- Aims to reduce iron deficiency anemia by adding iron to commonly-consumed and commercially-produced condiments and staples based on the dietary patterns unique to each country
- Consists of research efforts from technology development to implementation
- Has been implemented in five countries: China, Vietnam, Cambodia, the Philippines and India.

Condiment fortification

Country	China	Vietnam	Cambodia
Partner	China CDC	NIN	RACHA
Food	Soy sauce	Fish sauce	Fish / Soy sauce
Fortificant	NaFeEDTA	NaFeEDTA	NaFeEDTA
Progress	<ul style="list-style-type: none"> - Stability - Efficacy - Effectiveness - National launch in 2004 	<ul style="list-style-type: none"> - Stability - Efficacy - Effectiveness - National launch in 2005 	<ul style="list-style-type: none"> - Stability - Efficacy - Effectiveness - National launch in 2011 - A mandatory standard for iron fortified fish sauce and soy sauce was issued in 2015

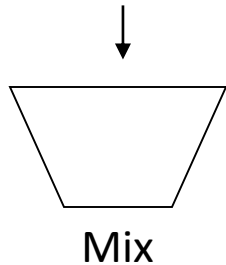
Staple food fortification

Country	Philippines	Vietnam	India	Cambodia
Partner	FNRI	NIN	St. John's Research Institute	RACHA
Food	Rice	Rice	Rice	Rice
Fortificant	Micronized ferric pyrophosphate	Iron and Zinc	Iron, lysine and others	Zinc , Folic Acid, thiamin
Progress	<ul style="list-style-type: none"> - Stability - Efficacy - Effectiveness - Market trial - Regional-wide launch in Mindanao Island in 2013 	<ul style="list-style-type: none"> - Stability - Efficacy - Effectiveness 	<ul style="list-style-type: none"> - Pilot study on lysine and iron - Estimation of lysine intake 	<ul style="list-style-type: none"> - Preliminary study in May 2017

Rice Fortification Process

The first step

Rice powder, micronutrients and others



The second step



Fortificants of Taiyo Kagaku

- Minerals (iron and zinc)
 - ✓ Super dispersion technology
 - ✓ High bioavailability
 - ✓ High stability
 - ✓ Minimize color change
 - ✓ No unpleasant flavor

The Cost of Rice Fortification

- Estimated incremental cost of fortifying rice
 - ✓ A 1.5-10% increase in the current retail price of rice

[Muthayya 2012 and Milani 2014]

- Affordability
 - ✓ Consumers in the Philippines accept a 5% increase in the current retail price of rice

[Agdeppa 2011]

Micronutrient deficiencies

- Micronutrient (vitamin and mineral) deficiency affects more than 2 billion people globally

In Cambodia

- The most important micronutrients in global public health and their prevalence among women of reproductive age in Cambodia

[CDHS 2014, UNICEF 2015]

Significant

Public Health problems

- ✓ Zinc: 62.8%
- ✓ Folate: 19.2%
- ✓ Thiamin (vitamin B1): 18.0-38.0%
- ✓ Iodine: 78.0%

Not significant

public health problems

- ✓ Vitamin A: 3.2%
- ✓ Iron: 2.6%

Health consequences of micronutrient deficiencies

- Mothers and children: increased maternal mortality, prematurity, early neonatal mortality
- Young children: delays in physical and cognitive development
- Adults: reduced physical endurance and productivity

Etiology of micronutrient deficiencies

- Inadequate dietary intake
- Poor dietary diversity
- Others: Infections, genetic, etc

Poor dietary habits of women of reproductive age

- High consumption of rice often reflects,
- Poor dietary diversity which results in,
- A high risk of micronutrient deficiencies
- Lower priority on meal times

Garment factory workers

- have limited time for lunch, thus,
- Consume sugary desserts or packaged food as snacks and/or meals

[FNG-WFP, 2017]

Nutrition Policies

- Sustainable Development Goals: Goal 2
End hunger, achieve food security and improved nutrition and promote sustainable agriculture (2016-2030)
- Cambodia: National Strategy for Food Security and Nutrition 2014-2018
Council for Agricultural and Rural Development (CARD)
 - ✓ Objective 2: Improve use and utilization of food
 - ✓ iii Expand fortification of food

Workplace Nutrition Project in Cambodia

Objective:

To improve the nutritional status of female factory workers by providing fortified rice at lunch time and nutrition education

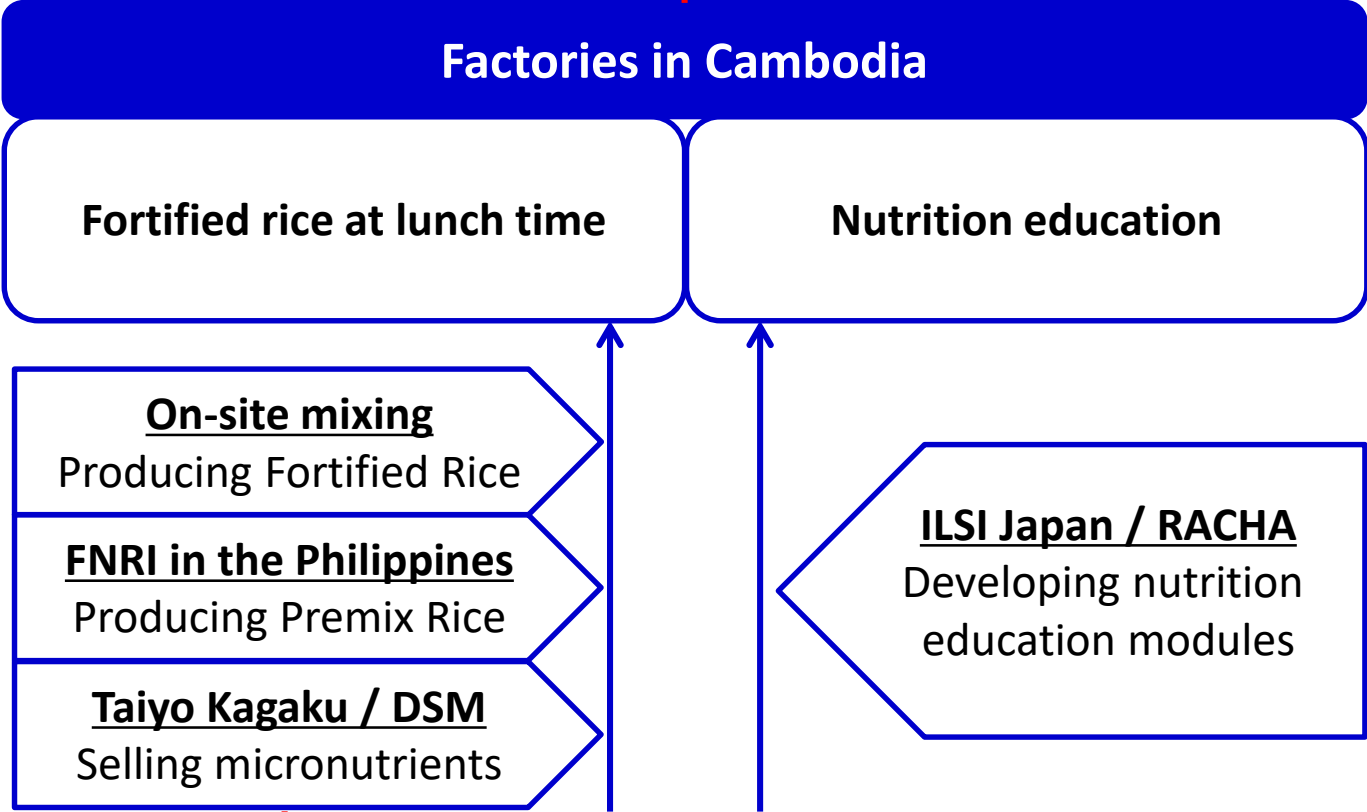
- Rice fortification
 - ✓ Vehicle: Rice (823g of cooked rice /day /person)
 - ✓ Fortificants: Zinc, Folic acid and Thiamin
 - ✓ Population group: Women of reproductive age
- Nutrition education
 - ✓ Improve dietary diversity (Minimum Dietary Diversity for Women)
 - ✓ Improve general knowledge of nutrition

Partners

- Ministry of Planning - NSCFF
- GMAC
- Reproductive and Child Health Alliance (RACHA)
- Nutrition Japan Public Private Platform (NJPPP)
- International Life Sciences Institute Japan (ILSI Japan)
- Taiyo Kagaku Co., Ltd.
- DSM Japan K.K.

Business Model

Increasing productivity
Reducing the rate of absenteeism
Improving nutritional status



Increasing the sales of micronutrients

Schedule

2017	Feasibility study <ul style="list-style-type: none">✓ Identifying partners✓ Discussion with partners on the project✓ Economic study
2018	Pilot study <ul style="list-style-type: none">✓ Producing premix rice and fortified rice✓ Blending test (homogeneity)✓ Storage test✓ Developing nutrition education modules
2019	✓ Effectiveness study (1 year)
2020	Implementation <ul style="list-style-type: none">✓ Advocacy✓ Implementation of the rice fortification and nutrition education program in factories