



# Say *Hello* to a Fortified Future

2016 YEAR IN REVIEW



**Food  
Fortification  
Initiative**

Enhancing Grains for Healthier Lives

## ABOUT THIS REPORT

The Food Fortification Initiative (FFI) is a public, private, and civic partnership. Together we help country leaders plan, implement, and monitor fortification programs for industrially milled grains. Our focus is wheat flour, maize flour, and rice. These grains are most commonly fortified with vitamins and minerals to prevent nutritional anemia and serious birth defects of the brain and spine.

***Our Vision:*** Smarter, stronger, healthier people worldwide by improving vitamin and mineral nutrition

***Our Mission:*** Support fortification of industrially milled cereal grains by collaborating with multi-sector partners

To receive our quarterly newsletters, contact us at [info@ffinetwork.org](mailto:info@ffinetwork.org).

Click on the icons below for links to follow us on social media.



The title of this review was inspired by a 2015 #FutureFortified Global Summit on Food Fortification. This report was produced by our communications team including To Le, Stephanie Santana, and Sarah Zimmerman; data collection by María Teresa Domínguez, Julia Merrill, Joana Rosales, Iju Shakya, and Daisy Wang.

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*A car loaded with bags of rice in the wholesale market area of Conakry, Guinea, illustrates part of the informal supply chain for this commodity in West Africa. Understanding whether rice is domestically grown or imported and whether it is industrially milled is key to maximizing the potential for rice fortification. This photo and the photo on page 6 are by David McKee.*

Much of the Food Fortification Initiative's work in 2016 involved laying the groundwork for a fortified future. In India and Africa in particular, in cooperation with our partners, we were busy guiding, analyzing, and training. Among the results were a draft regulation likely to affect millions of people in India, an outline of how fortified rice could improve the health of 130 million people in Africa, and an online tool to train fortification leaders around the world.

Continue reading for more information on these accomplishments and other highlights from 2016.



# INDIA DEVELOPS WHEAT FLOUR FORTIFICATION STANDARDS

Standards are documents a country creates to specify the type and levels of nutrients for millers to include in fortified food. Our research published in [2015](#) showed that flour fortification programs are more likely to yield a health impact if the standards follow World Health Organization (WHO) recommendations.

Early in 2016 the Food Safety and Standards Authority of India (FSSAI) drafted fortification standards for rice and wheat flour. To urge FSSAI to consider WHO recommendations for wheat flour, we met with senior staff from the WHO India office, the Ministry of Health and Family Welfare, the National Institute of Nutrition, the Coalition for Food and Nutrition Security, POSHTIK (a network of development partners), and the FSSAI Scientific Committee. Staff from the U.S. Centers for Disease Control and Prevention (CDC) as well as the Micronutrient Initiative (MI) joined the efforts.

Collective comments were submitted to the FSSAI Scientific Committee for their consideration. The FSSAI published revised draft standards for wheat flour fortification in October 2016, and these follow the WHO recommendations for iron, folic acid, and vitamin B12. This draft is online for a period of public comment. In media coverage of the FSSAI announcement, national industry leaders said they were “keen” to fortify.

FSSAI, in collaboration with ministries and departments of the Government of India, is consulting with state governments to promote use of fortified foods in various programs designed to benefit millions of low-income people. These programs include the public distribution system, mid-day meals, and integrated child development. Having standards that follow global recommendations is an important milestone toward a fortified future in India.

- [Draft Food Safety and Standards \(Fortification of Foods\) Regulations, 2016](#)
- [India updates on our website](#)
- [Systematic review yields recommendations for flour fortification programs](#)





Leaders from various government ministries in India launch draft fortification standards and a logo for fortification during an October 2016 National Summit on Fortification of Food.

### Our other activities in India in 2016 included:

- Providing technical support to the government of Haryana as it announced plans to provide fortified atta (whole wheat flour) instead of wheat grains to beneficiaries of various safety net programs. This approach will begin in part of the state’s Ambala district.
- Providing technical support for a wheat flour fortification project in Mumbai.
- Offering guidance to plans for a randomized control trial with fortified rice in the Cuddalore district of Tamil Nadu.

Tata Trusts supported the Mumbai and Tamil Nadu activities.



In 2016, we participated in several conferences throughout India. Above, Subrata Dutta, FFI India Coordinator, is seated the third from the left among a panel of speakers at an industry seminar on wheat and wheat products in July.



# BEYOND WHEAT FLOUR IN AFRICA

## Maize Analysis Leads to 10-Year Strategy

In southern Africa, maize is the most commonly consumed cereal crop. In some places, maize consumption constitutes 52-65% of the population's energy intake, yet less than 30% of the industrially milled maize flour in Africa is fortified.

To understand the potential for fortified maize flour, Smarter Futures conducted a scoping study of maize production and fortification practices. Results were presented during a strategy development workshop in October in Tanzania. Participants from 14 countries discussed the opportunities and challenges of maize flour fortification, added missing information from their country to the study, and developed road maps for maize fortification.

Based on the workshop deliberations and the scoping study, Smarter Futures developed a 10-year maize fortification strategy for Africa. The document acknowledges that fortifying maize flour produced in small mills is not feasible in the near future. Yet enough maize is milled in industrial settings that maize flour fortification is worth pursuing. The plan outlines areas of focus and 13 expected results. It also provides guidance to countries in preparing country-specific strategic plans. The vision of the maize strategy is a “micronutrient malnutrition-free Africa.”

- [Africa Maize Fortification Strategy 2017-2026](#)
- [Maize workshop presentations](#)

**Smarter Futures** is a partnership for Africa that includes the Ministry of Foreign Affairs of the Netherlands, AkzoNobel, the Food Fortification Initiative, Helen Keller International (HKI) and the International Federation for Spina Bifida and Hydrocephalus (IF).

Smarter Futures began in 2009, and much of the progress in Africa is due to this collaboration.

- [Smarter Futures](#)



# RICE EVALUATION REVEALS OPPORTUNITIES

Outside of Asia, the highest per capita consumption of rice occurs in West African countries. In 2016, we worked with the Global Alliance for Improved Nutrition (GAIN) to analyze opportunities for fortified rice to improve nutrition in Africa.

After conducting an in-depth analysis of trade flows and national practices, we found that in 12 countries, fortification of imported rice has the potential to reach 130 million people. Though many of these countries already have legislation to fortify wheat flour, rice is more commonly consumed and has greater potential to improve health. Costa Rica's [experience](#) suggests that fortifying multiple staple cereal grains reaches different pockets of the population.

Plus, if these countries were to require fortification of rice imports, the demand would oblige millers in exporting countries such as Thailand, Viet Nam, and India to develop the capacity to fortify rice. This would help bring rice fortification to the scale needed for it to be more financially feasible.

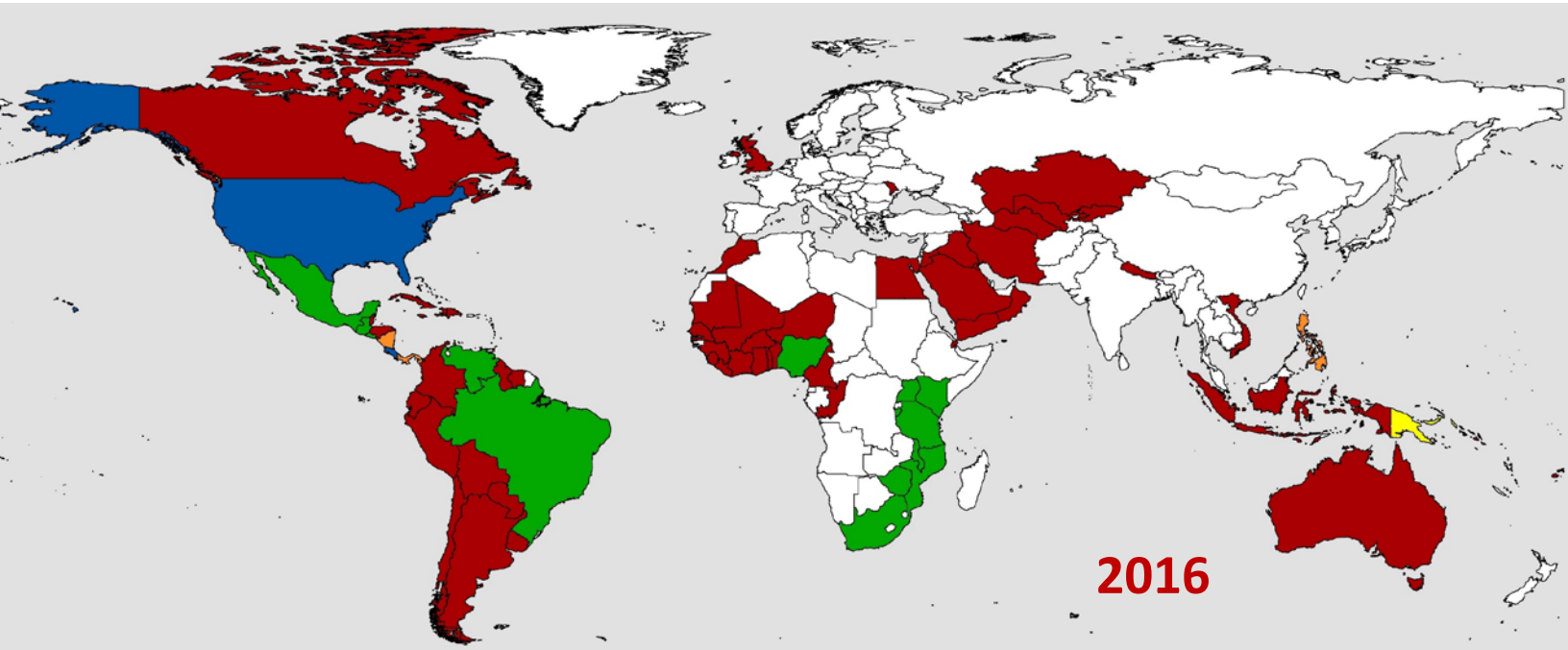
In Africa, most domestically produced rice is milled in small operations where fortification is not feasible. However, governments in some of these countries are pushing for farmers to grow more rice rather than rely on imports. More domestically produced rice will likely lead to more industrial milling where fortification is plausible. Understanding the rice supply chain is a key step toward a future fortified in West Africa.

- [Rice analysis executive summary and individual country profiles](#)
- [Effectiveness evaluation of the food fortification program of Costa Rica: impact on anemia prevalence and hemoglobin concentrations in women and children](#)



# LEGISLATION

In 2002 when FFI began, 44 countries had legislation to fortify wheat flour. At the end of 2016, 87 countries had legislation to mandate fortification of at least one industrially milled cereal grain, as noted in the map below.



2016

	Wheat flour – 67 countries		Wheat flour and rice – 3 countries (Nicaragua, Panama, Philippines)
	Rice – 1 country (Papua New Guinea)		Wheat flour, maize flour, and rice – 2 countries (Costa Rica and the United States)
	Wheat flour and maize flour – 14 countries		No grain fortification legislation

Mandatory means the legislation has the effect of mandating fortification of one or more types of wheat or maize flour or rice with at least iron or folic acid.







*Viet Nam was among the countries that passed mandatory legislation for grain fortification in 2016.  
Photo by Tim Lam @Flickr Creative Commons.*

## **New Fortification Legislation**

The Pacific Island country of Kiribati enacted mandatory legislation for wheat flour fortification in 2016. Three other countries passed legislation to fortify grain products and other foods:

- **Viet Nam**: wheat flour, salt, and cooking oil
- **Mozambique**: wheat flour, corn meal, cooking oil, sugar, and salt
- **Zimbabwe**: wheat and maize flour, sugar, and cooking oil

## **Voluntary Fortification**

In some countries, millers voluntarily add nutrients to flour even though the government does not require it. We consider a country voluntary if at least half of the industrially milled flour or rice is fortified through these voluntary efforts.

Eight countries meet this definition of voluntary for wheat flour fortification: Afghanistan, Democratic Republic of Congo, Gambia, Lesotho, Namibia, Qatar, Swaziland, and the United Arab Emirates. In addition, Lesotho and Namibia voluntarily fortify more than 50% of their industrially milled maize flour.

- **[See Country Profiles on our website for country-specific information.](#)**



# BEYOND LEGISLATION

## Quality Assurance/Quality Control

Though 27 countries in Africa have mandatory flour fortification legislation, regulatory monitoring has some weaknesses. Problems include a lack of clarity on roles and responsibilities between industry and different government agencies.

To address these issues, Smarter Futures held a Quality Assurance/Quality Control workshop in May in Uganda. Participants included 79 people from eight countries (Uganda, Burundi, Rwanda, Mozambique, Tanzania, South Sudan, Kenya, and Zambia).

Students and lecturers from academic institutions in the participating countries attended; the organizers' goal in inviting them was to raise a new generation of fortification specialists in Africa. Their involvement was supported by VLIR-UOS (a development cooperation in Belgium) and Ghent University, also in Belgium.

- [See all presentations, the full meeting report, and more photos](#)



*Participants in the Quality Assurance/Quality Control workshop in Uganda visited a Bakhresa Flour Mill (above) and a Uganda National Bureau of Standards analytical laboratory to see monitoring steps being conducted. Photo by Tom Hellemans.*



## FORTIMAS Training

In June Mozambique leaders were trained to use FORTIMAS (Fortification Monitoring and Surveillance). Turkmenistan leaders were also trained to use FORTIMAS in 2016.

FORTIMAS lets users assess trends in program coverage and nutrient status in easy-to-reach populations. A key benefit is that FORTIMAS can be used with data already collected for other purposes. FORTIMAS offers flow-charts and decision trees to assess overall program performance from inception and during implementation. The materials are designed to facilitate feedback from stakeholders and identify ways to amend the program as needed. FORTIMAS was developed by Smarter Futures. In 2016 Helen Keller International translated FORTIMAS into Portuguese to complement the English and French versions. Also in 2016, UNICEF in Turkmenistan translated it into Russian, but the translation is not yet online.

- [FORTIMAS English](#)
- [FORTIMAS Française](#)
- [FORTIMAS Português](#)



*Nokuthula Lucas, Marla Amaro, and Eduarda Mungoi were among the FORTIMAS workshop participants in Mozambique. Photo by Helena Pachón.*



*Talatu Ethan, left, Deputy Director of Laboratory Services for the Standards Organization of Nigeria, prepares to demonstrate the iron spot test during a Training of Trainers meeting in September 2016.*

*The iron spot test is a simple, rapid test to indicate qualitatively whether iron has been added to the flour. A version of the test is also available for rice.*

*Photo by Phillip Makhumula.*



## Global Capacity Building

With partner collaboration, we developed two tools in 2016 to be used for global capacity building. One is an online course to teach basic concepts of internal, external, import, and commercial monitoring. We created the course in collaboration with the Global Alliance for Improved Nutrition (GAIN), and the IGP Institute at Kansas State University. The tool guides participants in planning for a monitoring system; engaging in internal, external, import and commercial monitoring activities; and collating, reporting and using monitoring data. Videos, photos, and examples enhance the monitoring concepts. Data collection forms are provided to facilitate country-based monitoring activities.

The second new tool is a Training of Trainers program that can be used to develop a cohort of flour fortification specialists. These specialists in turn can advise others on fortification issues such as working with a multi-sector alliance, developing legislation and standards, implementing fortification, and ensuring quality control and quality assurance at the mill. The course was developed with funding from the U.S. Agency for International Development (USAID).

The pilot Training of Trainers course was in Nigeria in September with participants from six countries: Ghana, Nigeria, Sierra Leone, The Gambia, Senegal, and Liberia. Helen Keller International facilitated the arrangements for the training.

Both new tools present materials in a style designed for adult learning and retention. For information, contact us at [info@ffinetwork.org](mailto:info@ffinetwork.org)



# PERCENT FORTIFIED

As an indicator of how well grain fortification programs are implemented, each year we estimate the amount of industrially milled wheat flour, maize flour, and rice that is fortified. The charts below reflect our estimates for 2016 and 2015. These numbers include fortification in mandatory programs as well as voluntary efforts.

Wheat flour	2015	2016
Global amount available for human consumption <sup>1</sup>	349,765,488	354,721,259
Amount industrially milled <sup>2</sup>	286,640,416	250,420,980
Total fortified industrially milled <sup>2</sup>	80,667,513	85,433,775
% of industrially milled wheat flour that is fortified	28.1	34.1

Maize flour	2015	2016
Global amount available for human consumption <sup>1</sup>	87,803,467	89,620,352
Amount industrially milled <sup>2</sup>	12,445,717	26,230,222
Total fortified industrially milled <sup>2</sup>	7,218,545	14,952,354
% of industrially milled maize flour that is fortified	58.0	57.0

Rice	2015	2016
Global amount available for human consumption <sup>1</sup>	371,704,171	377,239,122
Amount industrially milled <sup>2</sup>	230,333,404	170,622,034
Total fortified industrially milled <sup>2</sup>	1,789,082	1,160,545
% of industrially milled rice that is fortified	0.8	0.7

Differences between 2016 – 2015		
<b>Wheat Flour</b>	Change in amount available for human consumption <sup>3</sup>	4,955,771 (1.4%)
	Change in % of flour from industrial mills <sup>4</sup>	-11.4%
	Change in % of flour fortified <sup>4</sup>	6.0%
<b>Maize Flour</b>	Change in amount available for human consumption <sup>3</sup>	1,816,885 (2.1%)
	Change in % of flour from industrial mills <sup>4</sup>	15.1%
	Change in % of flour fortified <sup>4</sup>	-1.0%
<b>Rice</b>	Change in amount available for human consumption <sup>3</sup>	5,534,951 (1.5%)
	Change in % of rice from industrial mills <sup>4</sup>	-16.7%
	Change in % of rice fortified <sup>4</sup>	-0.1%

<sup>1</sup> metric tons; Food and Agriculture Organization of the United Nations (FAO) for 2013, the most recent year with data from most countries.

<sup>2</sup> metric tons; FFI calculations. See next page.

<sup>3</sup> metric tons; FAO data from 2011 used for the 2015 estimates; FAO data from 2013 used for the 2016 estimates.

<sup>4</sup> FFI calculations.



# HOW WE CALCULATE GLOBAL ESTIMATES

We begin with data from the Food and Agriculture Organization of the United Nations (FAO) about how much grain is available in the food supply for each country. For the 2016 estimates, we used 2013 data because it is the most recent year with information from most countries. For the 2015 estimates, we used data from 2011.

## Flour and rice available

To calculate the amount of wheat flour available, we multiply the metric tons of wheat available in each country by the country's average flour extraction rate. We use 75% as the default extraction rate unless we have country-specific data.

For maize, we use regional extraction rates of 67.5% for Africa and 72.5% for South/Central America and the Caribbean. We use an extraction rate of 70% elsewhere.

No extraction rate adjustment is needed for rice as FAO data represents the "milled rice equivalent."

## Industrially milled

We then adjust the numbers to reflect industrial production. We assume that 100% of wheat flour is industrially milled, with the exception of countries with a large number of small mills, such as Afghanistan, India, Nepal, and Pakistan. In contrast, we assume that 0% of maize flour and rice are industrially milled unless we have country-specific data to indicate otherwise.

## Percent fortified

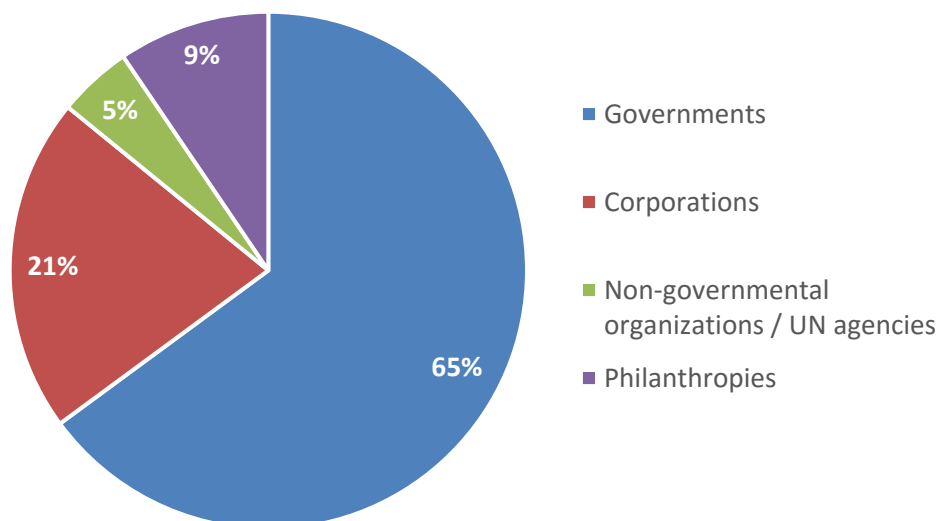
We then ask national partners in governments, milling associations, non-governmental organizations, and United Nations agencies to estimate how much of each grain is fortified in their country.

We then compile the country figures into the global estimates on the previous page.



# GIFT PROFILE

2016 Contributions: U.S. \$2.36 million



*Contributions to FFI are used to provide technical assistance for planning, implementing and monitoring successful fortification programs. For example, gifts during the 2016 calendar year allowed us to develop a strategy for fortifying maize flour in Africa and support development of standards for wheat flour fortification in India. In addition, the GiveWell nonprofit organization recommended us as a “standout charity.”*

## HOW TO CONTRIBUTE

The National Foundation for the Centers for Disease Control and Prevention, Inc. (CDC Foundation), a U.S.-based 501(c)(3) public charity, serves as the grant administrator for most financial contributions to FFI. Its Federal Tax Identification Number is 58-2106707. For more information, please contact Rachel Ward Jackson, Senior Advancement Officer, at [rjackson@cdcfoundation.org](mailto:rjackson@cdcfoundation.org).



## 2016 SUPPORTERS

We are grateful to the following donors who contributed to our work:

- Australian Department of Foreign Affairs ‡
- Bühler Group ‡
- Bunge Ltd. ‡
- Cargill, Inc. ‡
- Emory University \* ‡
- GiveWell
- Global Alliance for Improved Nutrition (GAIN) ‡
- Interflour Group PTE, Ltd. ‡
- International Association of Operative Millers (IAOM) \* ‡
- International Federation for Spina Bifida and Hydrocephalus \* ‡
- Micronutrient Initiative ‡
- National Foundation for the Centers for Disease Control and Prevention, Inc. (CDC Foundation)
- National Philanthropic Trust
- Tata Trusts
- United Nations Children's Fund (UNICEF) ‡
- U.S. Agency for International Development (USAID)
- U.S. Centers for Disease Control and Prevention (CDC)
  - National Center for Chronic Disease Prevention and Health Promotion ‡
  - National Center on Birth Defects and Developmental Disabilities ‡

\* In-kind donation

‡ Multiple year donor

We also received in-kind donations from multiple in-country stakeholders.

As noted on page 5, the Smarter Futures partnership supports fortification work in Africa.





# EXECUTIVE MANAGEMENT TEAM

An Executive Management Team (EMT) representing global leaders in the public, private, and civic sectors provides our strategic direction. In addition to the 10 members listed below, the U.S. Centers for Disease Control and Prevention and World Health Organization are EMT observers.

## Greg Harvey (Chair)

CEO

**Interflour Group PTE, Ltd.**

## Peter Böhni

Managing Director, Ecole Polytechnique Fédérale de Lausanne (EPFL or Swiss Federal Institute of Technology), Innovation Satellite

**Bühler AG**

## Jule Taylor

Vice President, Corporate Plant Operations

**Cargill, Inc.**

## Lieven Bauwens

Secretary General

**International Federation for Spina Bifida and Hydrocephalus**

## Greg S. Garrett

Director, Large-Scale Food Fortification

**Global Alliance for Improved Nutrition (GAIN)**

## Roland Kupka

Senior Adviser, Micronutrients, Nutrition Section

**United Nations Children's Fund (UNICEF)**

## Mauro Cerati

Vice President, Global Milling and Global Account Development

**Bunge Limited**

## Reynaldo Martorell

Woodruff Professor of International Nutrition;

Senior Advisor, Global Health Institute

**Emory University**

## Melinda Farris

Executive Vice President

**International Association of Operative Millers (IAOM)**

## Luz Maria De-Regil

Director, Research and Evaluation and Chief

Technical Advisor

**The Micronutrient Initiative**



**Thanks for  
fortifying my  
mom's flour!**

