15 Years of Partnering for Success

2017 ANNUAL REPORT

Food Fortification Initiative
Enhancing Grains for Healthier Lives
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On The Cover (clockwise from top)

A girl in the Kibera slum of Nairobi, Kenya, is an example of an urban poor resident likely to benefit from fortified grain products. In 2017, we used data from an International Food Policy Research Institute report and information from industry partners to explore fortification's reach among the urban poor. Photo by Trocaire @Flickr Creative Commons.

Two participants at the Eastern and South Africa Training of Trainers event are dressed to tour Unga Flour Mills in Nairobi, Kenya. Our workshops often include mill visits for participants to see fortification in action. We appreciate the mill owners for opening their doors. Photo by Phillip Makhumula.

Helena Pachón, our nutrition scientist, was a moderator at a Central Eurasian Nutrition Forum in June in Mongolia. Food Fortification Initiative (FFI) photo.

Among other meetings not highlighted in this report where our staff presented or participated in 2017 were:
• Pre-congress workshop on birth defects in conjunction with the Asia-Pacific Conference on Human Genetics
• 8th International Conference on Birth Defects and Disabilities in the Developing World
• Symposium on Sustainable Food Systems for Healthy Diets and Improved Nutrition in the Near East and North Africa
  • Global Millers Symposium
  • Global Prevention of Neural Tube Defects for Public Health Grand Rounds hosted by the US Centers for Disease Control and Prevention

Yevgeniy Gan, President of the Union of Grain Processors of Kazakhstan, was interviewed by local media during the Fortify Our Future regional summit for improving the health of women and children through flour fortification. Led by the Global Alliance for Improved Nutrition (GAIN) with support by multiple partners, the summit drew 117 participants from eight countries. GAIN photo.
ABOUT US

The Food Fortification Initiative (FFI) fosters fortification of wheat flour, maize flour, and rice. Our vision is smarter, stronger, and healthier people worldwide by improving vitamin and mineral nutrition.

Iron deficiency in childhood limits cognitive development. Fortifying commonly consumed grains with iron makes people **SMARTER**.

Anemia causes debilitating fatigue. Fortifying with nutrients that can prevent anemia makes people **STRONGER**.

Insufficient folic acid can cause birth defects of the brain and spine. Poor nutrition also affects growth and the immune system. Fortifying with vitamins and minerals makes people **HEALTHIER**.

Our mission is to provide technical support to governments and industry to plan, implement, and monitor sustainable, industrial flour and rice fortification.

[www.FFInetwork.org](http://www.FFInetwork.org)

To receive our quarterly newsletters, sign up [here](http://www.FFInetwork.org) or contact us at info@ffinetwork.org.

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

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This report was produced by our communications team including Sarah Zimmerman, To Le, and Hallie Averbach; data collection by Joana Rosales, Simone Francis, María Teresa Domínguez, and Ra’ed Shawkat Hailat.

Birthday Stories Validate Founding Principle

To celebrate our 15th birthday in 2017, we asked 15 people from all walks of life to tell us their stories. We wanted to know what inspired them to be involved in fortification and how their country was prioritizing nutrition.

We did not ask questions specifically about multi-sector collaborations. Yet these individuals all stressed public, private, and civic partnership as an important component of success.

One of our guiding values is that partners representing every sector should be included throughout the fortification process because every group’s expertise is needed for success. Our best birthday gift was for this principle to be validated by individual leaders in national grain fortification programs.

See individual stories from the 15 champions on our website, or click on the pictures below. Stories of multi-sector collaborations leading to success are throughout this 2017 Annual Report. Look for the circles and quotes.

Abbubakar Bakhresa
Tanzania

Agron Gashi
Kosovo

Do Hong Phuong
Vietnam

Eduarda Mungoi
Mozambique

Victor Temple
Papua New Guinea

Ayoub Al-Jawaldeh
Egypt

Godfrey Oakley
United States

Greg Harvey
Singapore

Shamil Tazhibayev
Kazakhstan

Terry Wefwafwa
Kenya

Deena Alasfoor
Oman

Nicolas Tskhlakis
Jordan

Pawan Agarwal
India

Sue Horton
Canada

Wilma Freire
Ecuador
**SCALING UP RICE FORTIFICATION**

Our work shows that for rice fortification to be economically feasible, much more rice needs to be fortified.

Currently less than 1% of the world’s industrially milled rice is fortified, and the cost to fortify is between US $6 and US $20 per metric ton. Increasing the demand for fortified rice globally would lower the cost. We have developed multi-year strategies for scaling up fortification of industrially milled rice in West Africa and China. Due to the large amount of rice that African countries import and the large amount of rice that China produces for domestic consumption, these two strategies have the potential to alter the scale of global rice fortification.

In 2017 we collaborated with the World Food Programme (WFP) to co-organize two events related to scaling up rice fortification. One was a meeting in July for partners involved in rice fortification. The second was a workshop in November to bring awareness of rice fortification to the 12 countries in Africa that could potentially benefit from fortification of industrially milled rice. See details about the November workshop at right.

**In addition to these events, in 2017 we helped the following countries work toward rice fortification:**

- **India** – We provided technical support for a rice fortification randomized control trial in Tamil Nadu. The project involves distributing fortified rice to public distribution system beneficiaries and comparing the nutrient status of those recipients with individuals who do not receive fortified rice.

- **Myanmar** – At the request of PATH, we analyzed the rice industry supply chain and distribution system, then made strategic suggestions to PATH on the way forward for rice fortification.

**Fortified Rice Taste Test** - Fred Grant of Helen Keller International (HKI) tries to tell the difference between fortified and unfortified rice. No one at a rice fortification workshop in Senegal in November 2017 was able to detect any difference in the two types of rice regarding taste, texture, color, or smell.

Countries represented at the workshop were Benin, Côte d’Ivoire, Gambia, Guinea Bissau, Liberia, Nigeria, Sierra Leone, Senegal, and Mali.

Partners involved were Food and Agriculture Organization of the United Nations (FAO), GAIN, HKI, Nutrition International, the United Nations Children’s Fund (UNICEF), and WFP.

*“Collaboration, convergence and communication are the key components for a successful fortification program at a national level.”*

**Pawan Agarwal**

India
- 44 countries – mostly in the Americas and the Middle East – had legislation requiring wheat flour fortification
- Nigeria became the first country in Africa to pass mandatory wheat flour fortification legislation
- Policy Planning Forum in conjunction with International Association of Operative Millers (IAOM) meeting in Mauritius helped start FFI. Among the founding partners were Emory University, the US Centers for Disease Control and Prevention (CDC), and the Micronutrient Initiative (now Nutrition International)

2003
- We were named the Flour Fortification Initiative

2004
- International technical workshop to develop global guidelines for flour fortification
- FFI Leadership Forum agreed that one focus of FFI would be to stimulate interaction between partners to facilitate national action
- Smarter Futures partnership began with goal of improving nutrition in Africa through fortification
- World Health Organization (WHO) published guidelines for wheat flour fortification
- Senegal passed legislation to fortify wheat flour, making it the 59th country with such legislation

2008
- Second technical workshop to further refine guidelines for wheat flour fortification

2009
- Nepal became the 63rd country to have legislation to fortify wheat flour
- Folic acid had been added to flour for 15 years to prevent birth defects of the brain and spine

2011
- Name changed to Food Fortification Initiative to reflect adding rice to our scope of work

2014
- WHO published guidelines for maize flour fortification
- Maize flour fortification strategy developed for Africa

2015
- An estimated 35,500 birth defects of the brain and spine - an average of 97 a day - are prevented each year due to flour being fortified with folic acid

2016
- 87 countries have legislation to fortify wheat flour, maize flour, and/or rice. See map on page 12
A company in India has started voluntarily fortifying its products and using the national fortified logo developed to help customers identify fortified foods.

See a list of rice fortification resources.

If you would like to be informed when new information is available about rice fortification, contact Becky Tsang and ask to join the rice fortification resource sharing platform: becky.tsang@ffinetwork.org.

- **Nepal** – At WFP’s request, Becky Tsang, our staff member who specializes in rice fortification, presented at the National Conference on Rice Fortification held in December 2017 in Kathmandu. Becky discussed global rice fortification experiences and rice fortification technology. WFP is supporting the government of Nepal to consider where rice fortification opportunities are possible, including fortification of rice used in school feeding programs.

- **Peru** – The country has mandatory salt and wheat flour fortification, but rice is the most consumed staple food. Country leaders participated in a regional rice fortification workshop in 2016 organized by the WFP. They asked Helena Pachón, our nutrition scientist, to visit Peru in July 2017 to address rice fortification with the National Health Commission, the National Fortification Alliance, and during a National Rice Fortification workshop. Peru has more than 600 rice mills which makes fortification more difficult than in a country with a consolidated industry. Yet the national leaders are hoping for rice fortification to help reduce anemia.

- **Solomon Islands** – Wheat flour milled in Solomon Islands is fortified, but rice is more commonly consumed. Nearly all the rice in Solomon Islands is imported, which means it is industrially milled and could be fortified. A standard for rice fortification is being developed, and a workshop of regulatory agencies was held in February 2018 to discuss how to implement, monitor and enforce the standard when it comes into effect. Dennis Bittisnich, our consultant, is working in the Solomon Islands to keep rice fortification as a priority for country leaders and provide technical support for implementation.

- **Sri Lanka** – The Ministry of Health hosted a National Wheat Flour and Rice Fortification workshop in March 2017. We helped plan the workshop which resulted in a work plan that the Ministry of Health’s Nutrition Steering Committee approved. WFP is leading rice fortification efforts in Sri Lanka and concentrating on social safety net segments because the rice distributed in those programs comes from large mills. The rest of the rice milling industry is made up of predominantly small mills which makes rice fortification less viable. Because wheat flour consumption is high in some groups, we are urging the government to mandate wheat flour fortification as a first step in reaching a large portion of the population with fortified staple foods.

“<em>If there is no joint planning among stakeholders, and if roles and measurable objectives are not defined, fortification will not be effective.”</em>

Wilma Freire
Ecuador
Building Capacity in Africa

Two training workshops in Africa in 2017 built capacity for national leaders to ensure that fortification programs have the desired health impact. Both regional events involved participants from a variety of professional backgrounds from several countries.

Quality Assurance/Quality Control

A Quality Assurance/Quality Control (QA/QC) workshop in Zambia in May was designed to enable millers to consistently produce a safe and quality product that meets national fortification standards. The workshop also increased the capacity of regulatory authorities to monitor fortified food production effectively and efficiently.

The workshop fostered dialogue among maize and wheat flour millers, government authorities, and university leaders as well as development partners. This led to an improved understanding of roles and responsibilities which will ultimately lead to better collaboration.

Participants included 65 flour millers and government food control and nutrition staff. The QA/QC workshop was jointly organized by the Ministry of Health Zambia and Smarter Futures which is a collaboration of the Ministry of Foreign Affairs of the Netherlands, AkzoNobel, FFI, HKI and the International Federation for Spina Bifida and Hydrocephalus (IF).

Additional sponsors included the East Central and Southern African Health Community (ECSA), WFP, GAIN, Hexagon Nutrition, BioAnalyt, Mühlenchemie, Bühler, and DSM.

Countries represented were Botswana, Lesotho, Malawi, Namibia, Nigeria, Swaziland, Zambia, and Zimbabwe.

Before the workshop, we provided cost-benefit analysis training for Zambian participants. Quentin Johnson, our technical coordinator, said understanding the economic losses from vitamin and mineral deficiencies is a key advocacy tool in many countries. He said seeing the results encouraged the Zambian leaders to commit to move forward with grain fortification.

Training of Trainers

The second capacity building workshop in Africa was held in Kenya in July to equip participants to train others in fortification monitoring. We trained 22 people to effectively share their new knowledge and skills with others. Participants completed an online training course prior to their attendance. At the event, they were trained in fortification and monitoring basics, multi-sector alliances, legislation and standards, premix, monitoring plans, equipping a mill for fortification, internal monitoring, and external monitoring. Countries represented were Burundi, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, Swaziland, Uganda, Zambia, and Zimbabwe. The Training of Trainers was possible due to support from the United States Agency for International Development (USAID).
**GLOBAL FORTIFICATION DATA EXCHANGE (GFDx)**

**Actionable food fortification data. All in one place.**

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**GFDx Provides Online Access to Fortification Data**

Two years of collaborative planning culminated in 2017 with the release of the Global Fortification Data Exchange (GFDx). The online platform presents data from more than 230 countries and territories at www.FortificationData.org.

For maize flour, oil, rice, salt, and wheat flour, the GFDx includes whether a country has mandatory or voluntary fortification legislation; the nutrients, levels and compounds in fortification standards; and the estimated amount of each food that is available for human consumption. Data can be viewed on maps and downloaded in spreadsheets on a country, regional, or global level. Users can also sort by the country’s income status and whether the fortification is mandatory or voluntary.

The GFDx became available on 6 September 2017, and within five months, people from 130 countries had accessed it. “The website users are potentially using data from GFDx to make well-informed decisions about their food fortification programs,” said Helena Pachón, our nutrient scientist who participated in GFDx planning.

A second version of the GFDx is being prepared for release in the first quarter of 2019. It will include more indicators such as whether the country has protocols for external and import monitoring of fortified foods and a system for measuring the quality and coverage of fortified foods.

At a Global Summit on Food Fortification in 2015, country representatives agreed that they needed improved access to data. We were involved in a multi-partner Global Fortification Technical Advisory Group that took up that challenge. One requirement was to identify a common set of indicators and definitions of terms.

As plans progressed, we were identified as the ideal group to provide data for grain fortification, while GAIN would maintain data on oil fortification, and the Iodine Global Network (IGN) would be the data steward for salt fortification. The Micronutrient Forum provided technical input into the process of developing the GFDx.

The group sought additional input from the global fortification community during a satellite session at the Micronutrient Forum in 2016. Camber Collective guided the platform creation, and TenPoint7 provided online development services.
**Percent Fortified**

**Volume of fortified, industrially milled wheat flour, maize flour, and rice increased in 2017**

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 chart below reflects our estimates for 2016 and 2017. These numbers include fortification in mandatory programs as well as voluntary efforts.

We estimate that the amount of industrially milled wheat flour that is fortified increased by 2 million metric tons in 2017. More flour is now industrially milled, however, so the percent of industrially milled flour that is fortified in 2017 was lower than in 2016. The increase in industrially milled flour comes primarily from China and India where flour fortification is not yet common practice.

The amount of industrially milled maize flour that is fortified also increased by 2 million metric tons in 2017, mostly due to more fortification in Nigeria and South Africa.

The amount of industrially milled rice that is fortified increased by more than 500,000 metric tons. At the same time, the amount of rice that is industrially milled increased by nearly 32 million metric tons, primarily due to changes in Bangladesh, China, and Myanmar.

<table>
<thead>
<tr>
<th>Wheat flour</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric tons available for human consumption globally¹</td>
<td>354,721,259</td>
<td>355,826,674</td>
</tr>
<tr>
<td>Metric tons industrially milled²</td>
<td>250,420,980</td>
<td>280,515,649</td>
</tr>
<tr>
<td>Metric tons industrially milled and fortified²</td>
<td>85,433,775</td>
<td>87,816,894</td>
</tr>
<tr>
<td>% of industrially milled wheat flour that is fortified²</td>
<td>34.1</td>
<td>31.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maize flour</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric tons available for human consumption globally¹</td>
<td>89,620,352</td>
<td>90,329,317</td>
</tr>
<tr>
<td>Metric tons industrially milled²</td>
<td>26,230,222</td>
<td>26,196,928</td>
</tr>
<tr>
<td>Metric tons industrially milled and fortified²</td>
<td>14,952,354</td>
<td>16,927,781</td>
</tr>
<tr>
<td>% of industrially milled maize flour that is fortified²</td>
<td>57.0</td>
<td>64.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rice</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric tons available for human consumption globally¹</td>
<td>377,239,122</td>
<td>377,287,279</td>
</tr>
<tr>
<td>Metric tons industrially milled²</td>
<td>170,622,034</td>
<td>202,498,571</td>
</tr>
<tr>
<td>Metric tons industrially milled and fortified²</td>
<td>1,160,545</td>
<td>1,702,934</td>
</tr>
<tr>
<td>% of industrially milled rice that is fortified²</td>
<td>0.7</td>
<td>0.8</td>
</tr>
</tbody>
</table>

¹ Food and Agriculture Organization of the United Nations (FAO) for 2013, the most recent year with data from most countries. FAO data used for 2017 were downloaded in March 2018
² FFI calculations. See next page.
HOW WE CALCULATE
GLOBAL ESTIMATES

Flour and Rice Available
To calculate the amount of wheat and maize flour available, we multiply the metric tons of grain available in each country by the country’s average flour extraction rate. For wheat, 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 for maize. 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 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.
In 2002 when FFI began, 44 countries had legislation to fortify wheat flour. At the end of 2017, 87 countries had legislation to mandate fortification of at least one industrially milled cereal grain, as noted in the map below.

Of the total, 86 countries have legislation to fortify wheat flour alone or in combination with maize flour and/or rice. In Papua New Guinea, rice is the only grain mandated for fortification.

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.

Countries include at least iron and folic acid in their fortification standard except Australia which does not include iron, and Congo, Papua New Guinea, the Philippines, the United Kingdom, Venezuela, and Viet Nam which do not include folic acid.

Download this map and an Excel spreadsheet with data that created it from our website.
MONITORING

NATIONAL FORTIFICATION COMMITTEES ARE COMMON; MONITORING REPORTS ARE NOT

In the last two years, we asked countries with grain fortification mandates about their monitoring procedures. We asked if they had documented procedures for monitoring at external, commercial, and import levels. We were also interested in knowing if the results were compiled in annual reports.

“Countries are more likely to monitor their programs if monitoring procedures are in place,” said Helena Pachón, our nutrition scientist. “Most countries report having a national committee that oversees fortification; we hope they meet regularly and discuss the program and how to improve it. In contrast, most countries do not create a report on how the program is operating. We believe that is important for informing all stakeholders of the status of fortification in their country.”

See our website for more information for internal, external, commercial, and consumption monitoring and impact evaluations. In addition, see examples of monitoring documents for cereal grain fortification from 13 countries. Also learn how to request a training example of FortifyMIS, a new online data collection and aggregation tool for fortification.

Percentage of countries which affirmed use of each monitoring component for the specific cereal grain:

<table>
<thead>
<tr>
<th>Monitoring component</th>
<th>Wheat a (n=58)</th>
<th>Maize b (n=14)</th>
<th>Rice c (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A national committee oversees the fortification program</td>
<td>67%</td>
<td>79%</td>
<td>60%</td>
</tr>
<tr>
<td>Rules and operating procedures for external monitoring of fortification at mill level by national authorities are stipulated in a document</td>
<td>67%</td>
<td>69%</td>
<td>20%</td>
</tr>
<tr>
<td>Rules and operating procedures for commercial monitoring of fortification at retail level by national authorities are stipulated in a document</td>
<td>51%</td>
<td>46%</td>
<td>20%</td>
</tr>
<tr>
<td>Rules and operating procedures for verification of fortification at import level by national authorities are stipulated in a document</td>
<td>70%</td>
<td>56%</td>
<td>25%</td>
</tr>
<tr>
<td>A national report on the status of fortification monitoring and compliance was compiled in the last year</td>
<td>43%</td>
<td>38%</td>
<td>20%</td>
</tr>
</tbody>
</table>

a 67% of countries that mandate wheat flour fortification responded to at least one question (58 of 87 countries).
b 88% of countries that mandate maize flour fortification responded to at least one question (14 of 16 countries).
c 83% of countries that mandate rice fortification responded to at least one question (5 of 6 countries).
**Gift Profile**

We are grateful to the following donors who contributed to our work in 2017:

- Australian Department of Foreign Affairs and Trade
- Bühler Group
- Cargill, Inc.
- Emory University
- GiveWell
- Global Alliance for Improved Nutrition
- Interflour Group PTE, Ltd.
- International Association of Operative Millers
- International Federation for Spina Bifida and Hydrocephalus
- National Philanthropic Trust
- Nutrition International
- United Nations Children’s Fund
- US Agency for International Development
- US Centers for Disease Control and Prevention
  - National Center for Chronic Disease Prevention and Health Promotion
  - National Center on Birth Defects and Developmental Disabilities

Much of our work in Africa is funded through the Smarter Futures collaboration described on page 8.

* In-kind donation
† Multiple-year donor

**How to donate:**

GiveWell, a nonprofit dedicated to finding outstanding giving opportunities, has ranked FFI as a "standout charity." Individuals can donate online here.

The National Foundation for the Centers for Disease Control and Prevention, Inc. (CDC Foundation), is a US 501(c)(3) public charity. It serves as the grant administrator for most of our financial contributions. Its Federal Tax Identification Number is 58-2106707. For more information on donating to FFI, please contact Rob Abraham, Senior Advancement Department at rabraham@cdcfoundation.org.

**Thank You!**
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 US Centers for Disease Control and Prevention and World Health Organization are EMT observers. The photo above shows EMT members, observers, guests, and our staff based in Atlanta, Georgia, USA, during the EMT’s meeting in November 2017.

**Greg Harvey (Chair)**
CEO
Interflour Group PTE, Ltd.

**Lieven Bauwens**
Secretary General
International Federation for Spina Bifida and Hydrocephalus

**Douglas Dunlay**
Vice President, Worldwide Grain Operations
Cargill, Inc.

**Melinda Farris**
Executive Vice President
International Association of Operative Millers

**Greg S. Garrett**
Director, Large-Scale Food Fortification
Global Alliance for Improved Nutrition

**Roland Kupka**
Senior Adviser, Micronutrients, Nutrition Section
United Nations Children’s Fund

**Reynaldo Martorell**
Woodruff Professor of International Nutrition;
Senior Advisor, Global Health Institute
Emory University

**Judith Monroe**
President and CEO
National Foundation for the Centers for Disease Control and Prevention, Inc.

**Luz Maria De-Regil**
Director, Research and Evaluation and Chief;
Technical Advisor
Nutrition International

**Walter von Reding**
Head, Grain Milling Flour Service
Bühler AG

* Greg Harvey was the Interflour representative on the EMT during this report period. He has since stepped down from Interflour, and the new company representative on the EMT is Avi Flintz.
We refer to fortification as a public-private-civic sector investment because successful fortification requires each of these groups to work together for the well-being of people.

Scott J. Montgomery
who became the FFI Director in 2011 after 30 years of experience in the private sector.