Global and Regional Overview of Flour Fortification

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What is Grain Fortification?

- Fortification adds vitamins and minerals during the milling process so that foods made with fortified grain products are more nutritious.
Nutrients Lost in Flour Milling

Wheat loses nutrients in the milling process, usually at levels indicated in the gray box.

Nutrients Included in Mandatory Grain Fortification Standards

- Iron
- Folic acid (vitamin B9)
- Thiamin (vitamin B1)
- Niacin (vitamin B3)
- Riboflavin (vitamin B2)
- Zinc
- Vitamin B12
- Vitamin B6
- Vitamin A
- Calcium
- Vitamin D
- Selenium

Source: Food Fortification Initiative, June 2016. For more information, contact info@ffinetwork.org
## Wheat Flour Fortification Progress

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries with mandates to fortify wheat flour with at least iron or folic acid</td>
<td>44</td>
<td>86</td>
</tr>
<tr>
<td>Percent of wheat flour fortified in industrialized mills worldwide</td>
<td>18</td>
<td>34.1</td>
</tr>
</tbody>
</table>

Reasons for Mandatory Legislation

- Equalizes costs for millers
- Sets appropriate standards including:
  - Best iron compound
  - Nutrient levels
- Can be more easily monitored than voluntary fortification
- Provides more equitable access to fortified foods
- Does not require consumer behavior change

Osmonbek Artykbaev, left, former Parliamentarian in the Kyrgyz Republic, helped the country pass legislation to require flour fortification.

Zimmerman, Mandatory policy: Most successful way to maximize fortification’s effect on vitamin and mineral deficiency. Indian Journal of Community Health 26 2014 Suppl S2:369-374
The combined population of countries requiring cereal grain fortification is 2.43 billion – One-third of the world’s population.

* Legislation has effect of mandating grain fortification with at least iron or folic acid.
Legislation status from the Food Fortification Initiative (www.FFInetwork.org) March 2017
Wheat Availability and Fortification Legislation

| 75 or more grams available per person per day | 86 countries |
| Less than 75 grams available per person per day | No availability or legislation data |

* Legislation has effect of mandating grain fortification with at least iron or folic acid; does not reflect how much grain is available. Grain availability data from the Food and Agriculture Organization (2011). Legislation status from the Food Fortification Initiative (www.FFInetwork.org) March 2017.
Maize Availability and Fortification Legislation

<table>
<thead>
<tr>
<th>Availability</th>
<th>Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 or more grams available per person per day</td>
<td>Mandatory fortification legislation *</td>
</tr>
<tr>
<td>Less than 75 grams available per person per day</td>
<td>16 countries</td>
</tr>
<tr>
<td>No availability or legislation data</td>
<td>No availability or legislation data</td>
</tr>
</tbody>
</table>

* Legislation has effect of mandating grain fortification with at least iron or folic acid; does not reflect how much grain is available. Grain availability data from the Food and Agriculture Organization (2011). Legislation status from the Food Fortification Initiative (www.FFInetwork.org) January 2017
Rice Availability and Fortification Legislation

75 or more grams available per person per day

Less than 75 grams available per person per day

Mandatory fortification legislation *
Costa Rica, Philippines, Papua New Guinea, Nicaragua, Panama, US

No availability or legislation data

* Legislation has effect of mandating grain fortification with at least iron or folic acid; does not reflect how much grain is available.
Grain availability data from the Food and Agriculture Organization (2011).
Legislation status from the Food Fortification Initiative (www.FFlnetwork.org) January 2017
## Fortification Opportunities

<table>
<thead>
<tr>
<th></th>
<th>Wheat Flour</th>
<th>Maize Flour</th>
<th>Rice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global amount available for human consumption(^1)</td>
<td>354,721,259</td>
<td>89,620,352</td>
<td>377,239,122</td>
</tr>
<tr>
<td>Amount industrially milled(^2)</td>
<td>250,420,980</td>
<td>26,230,222</td>
<td>170,622,034</td>
</tr>
<tr>
<td>Total fortified industrially milled(^2)</td>
<td>85,433,775</td>
<td>14,952,354</td>
<td>1,160,545</td>
</tr>
<tr>
<td>% industrially milled that is fortified</td>
<td>34.1</td>
<td>57.0</td>
<td>0.7</td>
</tr>
</tbody>
</table>

\(^1\) metric tons; Food and Agriculture Organization of the United Nations (FAO) for 2013, the most recent year with data from the majority of countries.

2016 Estimates

Industrially milled wheat flour: 27.9% fortified

Industrially milled maize flour: 58.0% fortified

Industrially milled rice: 0.8% fortified
Flour Fortification in Africa: 12 Years of Progress

2004

2016

Mandatory fortification: Country has legislation to mandate fortification of wheat flour and/or maize flour (27 countries in November 2016)

Voluntary fortification: At least 50% of the industrially milled wheat or maize flour is fortified through voluntary efforts (5 countries in November 2016)
In Summary

The Problem:
One-third of the world’s population suffers from vitamin and mineral deficiencies. In many countries, both lower and higher income populations are affected.

– World Bank 2006

Part of the Solution:
Within countries, FFI stimulates interaction among partners so that together we can achieve results that none of us could achieve independently.

www.FFInetwork.org
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