Flour Fortification: Millers and Governments Working Together to Reduce Vitamin and Mineral Deficiencies

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What is Flour Fortification?

Fortification is adding vitamins and minerals to flour during the milling process so that foods made with the flour are more nutritious.
Wheat and maize lose nutrients in the milling process. Fortification replaces those and can add other vitamins and minerals as needed.

**Essential Nutrients Lost in Milling**


Most flour is milled at 75% extraction.
Burden of Deficiencies

Vitamin and Mineral Deficiencies:

• Impair millions of growing minds and lowers national IQ
• Cause damage to immune systems and deaths of more than a million children a year
• Cause 300,000 serious birth defects annually
• Contribute to the death of approximately 60,000 young women a year during pregnancy and childbirth
Burden of Iron Deficiency

- Reduces work capacity
- Impairs a child's physical and intellectual development
- Contributes to 20% of all maternal deaths
Burden of Anemia

• 17% lower productivity in heavy manual labor
• 5% lower productivity in other manual labor
• Estimated 4% loss of earnings due to lower cognitive skills
Burden of Insufficient Folic Acid

• Leads to neural tube defects (NTDs) such as spina bifida and anencephaly
• Most of these birth defects are preventable; flour fortification will reduce NTD’s by 50%
• Cost Benefit Ratio for preventing NTD’s: 1:12 (Chile), 1:30 (South Africa), 1:48 (USA)

Centers for Disease Control and Prevention: http://www.cdc.gov/ncbddd/folicacid/faqs.html
FFI is network of partners working together to make flour fortification standard milling practice so that people worldwide are smarter, stronger and healthier.
# Annual Financial Partners

**CDC, Interflour, Buhler, Bunge, Cargill, GAIN, General Mills, Micronutrient Initiative, UNICEF**

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<th>Special Purpose Funding</th>
<th>Contributors to Special Events</th>
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<td>• Smarter Futures</td>
<td>• Hexagon</td>
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<td>• CDC Birth Defects</td>
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Multi-faceted Approach

Population Without Market Access
- Micronutrient Powders
- Supplements
- Dietary Diversity

Population With Market Access
- Wheat & Maize
- Condiments
- Rice
- Oil
Impact on Nutrition Security

As food prices go up, consumers often stop buying as many meats, fruits and vegetables.

Fortifying flour puts more vitamins and minerals in staple foods which people continue to purchase and consume during economic downturns.
Global Consensus

- Copenhagen Consensus
- World Health Organization recommendations
- UNICEF
Wheat Flour Fortification Legislation

October 2012: 75 countries require iron and/or folic acid in wheat flour

All countries fortify flour with at least iron and folic acid except Australia which does not include iron, and Venezuela, the United Kingdom, the Philippines, and Trinidad and Tobago which do not include folic acid.
Flour Fortification Progress

Since 2004:

- Fortified flour from industrial mills increased from 18% to 30%
- Number of countries with documented national regulations for mandatory wheat flour fortification increased from 33 to 75.

The combined population of these 75 countries is 2.09 billion
Cost to Fortify

Recurring costs of buying quality premix with iron, folic acid and other B vitamins is between US $1.50-3 per metric ton of flour.

The per person, per year cost to fortify wheat flour may be as little as eight to ten cents.

One metric ton of flour is about 2,200 pounds, as pictured here.
Global Best Practices

To plan a flour fortification program, consider:

• Local culture and cereal consumption
• Nutritional needs/health burden
• Industry analysis
• Creation of a multi-sector national fortification alliance
• Legislation:
  • make fortification mandatory
  • include fortification in the QA/QC processes
  • adopt an industry standard
Reasons for Mandatory Legislation

- Equalizes costs for millers
- Sets appropriate standards
  - Best iron compound
  - Levels of other vitamins and minerals
- Can be more easily monitored
- Provides more equitable access to foods made with fortified flour
- Reduces need for expensive marketing campaigns
FFI Stimulates Network Interaction

Civic Sector

Private Sector

Public Sector

Disability groups, advocacy associations, other civil organizations

Millers, equipment and flour-product companies, wheat traders and baking organizations, other affiliated businesses

Agencies of the United Nations, government agencies and other national entities, non-government organizations, academic organizations

FFI
Focus On National Partnerships

- Flour fortification is most successful when it is driven by national leaders.
- Multiple sectors must work together.
- Success of flour fortification in one country can have an accelerating influence in the region.
- A national standard approach is the most effective way forward.
- Reaching the top decision makers is essential.
FFI’s Five Strategies

- Offer training and communications expertise
- Mobilize global leadership
- Secure human and financial resources
- Monitor fortification programs
- Support National Partnerships
Current activities in Asia

- Indonesia and Philippines: mandatory fortification for many years. Also in Fiji and Solomon Islands.
- Nepal announced mandatory flour fortification last year.
- Mongolia and Malaysia drafting legislation.
- PNG started working on mandatory fortification.
- FFI started talking to stakeholders in Bangladesh and Cambodia.
- In Vietnam, Sri Lanka and China discussions are ongoing.
- And in India......
India Wheat Fortification Activity

Fortification in Gujarat and Andhra Pradesh is in both open market and welfare schemes; other states are only fortifying in welfare schemes.*

*Note: Jharkhand and Meghalaya are not included in the map.
Fortified Wheat Flour Program in Delhi

- Govt. of Delhi in collaboration with city flour mills and IFFN launched fortified flour on 11 Sept. 2012 for 50 million poor and middle class populations in Delhi capital
- 10 kg. fortified flour is sold at US $3, less than 2 US$ in the market
Materials

- www.ffinetwork.org
- WHO recommendations
- Food studies report
- Flour Millers’ toolkit
Flour Millers' Toolkit

While representatives of the public, private, and civic sectors all have important roles in flour fortification, millers carry out the program’s requirements daily. Millers secure materials, equip facilities with proper machinery, and maintain equipment. Flour millers usually cover the costs of these capital investments, and very often they pay the on-going expense of purchasing the vitamins and minerals to add to flour. The millers’ costs are frequently passed along to consumers in the form of higher prices, but the additional cost to consumers is as little as 0.01 per five kilograms of flour.

Quality control is the responsibility of both flour millers and external food safety authorities, such as government representatives. See “Monitoring for Quality and Impact” for guidance on quality control.

Highlights of the Flour Millers’ Tool Kit are below. The complete Tool Kit can be downloaded in English, Arabic, Chinese, French, and Russian.

Technical Topics:

- Fortifying flour with vitamins and minerals will not improve flour made with poor quality wheat. If low quality wheat is used, consumers could blame the inferior flour on the fortification and reject all fortified products.
- The most common way to fortify flour is using a micro feeder, also called a dosifier. This adds premix to flour at pre-determined rates in the process of flour production.
- Three types of feeders are available: screw, revolving disk and drum or roller. Screw feeders are the most common. They disperse a continuous stream of premix at a pre-determined rate. The other two
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.
Thank You