**Global Nutrition Challenge**

Two billion people worldwide suffer from vitamin and mineral deficiencies\(^1\) with enormous consequences for both individuals and nations.

Deficiencies of iron, folate (vitamin B9), riboflavin, vitamin A, vitamin B12, and zinc are among the causes of anemia which leads to debilitating fatigue and lowered productivity. Also, pregnant women with anemia are twice as likely to die during or shortly after pregnancy compared to those without anemia.\(^2\)

Insufficient folic acid (also vitamin B9) leads to common birth defects of the brain and spine. Even with excellent healthcare, these may be fatal or permanently disabling. Most of these birth defects can be prevented if women have 400 micrograms of folic acid daily before conception and in the early weeks of pregnancy.\(^3\)

The effects of vitamin and mineral deficiencies are mostly invisible, and country leaders often devote time to more tangible health problems. For example, if present trends are maintained, the probability of reducing anemia by half by 2025 is negligible.\(^4\)

**Fortification: A Proven Solution**

A proven solution is to add essential nutrients to common foods. Called fortification or enrichment, this takes advantage of existing distribution channels and does not require consumers to change behaviors. In public health, fortification is unique because it relies on a partnership between governments and the food industry.

Flour and rice can be fortified with an array of vitamins and minerals, making it one intervention with multiple health impacts.
National and Global Success

Fiji\(^5\) and Cameroon\(^6\) are examples of countries that have reported improvements in nutritional status after fortifying wheat flour.

Globally an estimated 50,270 birth defects of the brain and spine were prevented in 2017 - an average of 137 a day – in countries where flour was fortified with folic acid.\(^7\)

Costs and Savings

Iron deficiency in early childhood is limiting cognitive development in 40 – 60% of the developing world’s children.\(^8\) This affects academic performance and is associated with a 2.5% drop in wages in adulthood.\(^9\)

The cost to fortify wheat flour in the U.S. is 7 cents per person per year.\(^10\) Some of the world’s top economists meeting as the Copenhagen Consensus consistently rank fortification as one of the most cost-effective interventions to address vitamin and mineral malnutrition. In Tanzania, for example, fortifying with iron, vitamin A, and folic acid is expected to yield US$ 8.22 in benefits for every dollar spent.\(^11\)

Spina bifida is one of the birth defects that can be mostly prevented with folic acid. US researchers found an annual net savings of US$ 603 million when they compared the costs of fortifying with folic acid to healthcare costs averted from preventing spina bifida.\(^12\)

Learn More

The Food Fortification Initiative (FFI) helps countries promote, plan, implement, and monitor sustainable grain fortification programs. To learn more, e-mail info@ffinetwork.org or visit www.FFInetwork.org.

Donations can be made via the CDC Foundation, a US based 501(c)(3) public charity which serves as FFI’s grant administrator, or GiveWell, which ranks FFI as one of eight “standout charities.”

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1World Health Organization 2006  2Daru 2018  3Centers for Disease Control and Prevention 2017  
4Stevens 2013  5National Food and Nutrition Centre 2010  6Engle-Stone 2017  
11World Bank 2012  12Grosse 2016