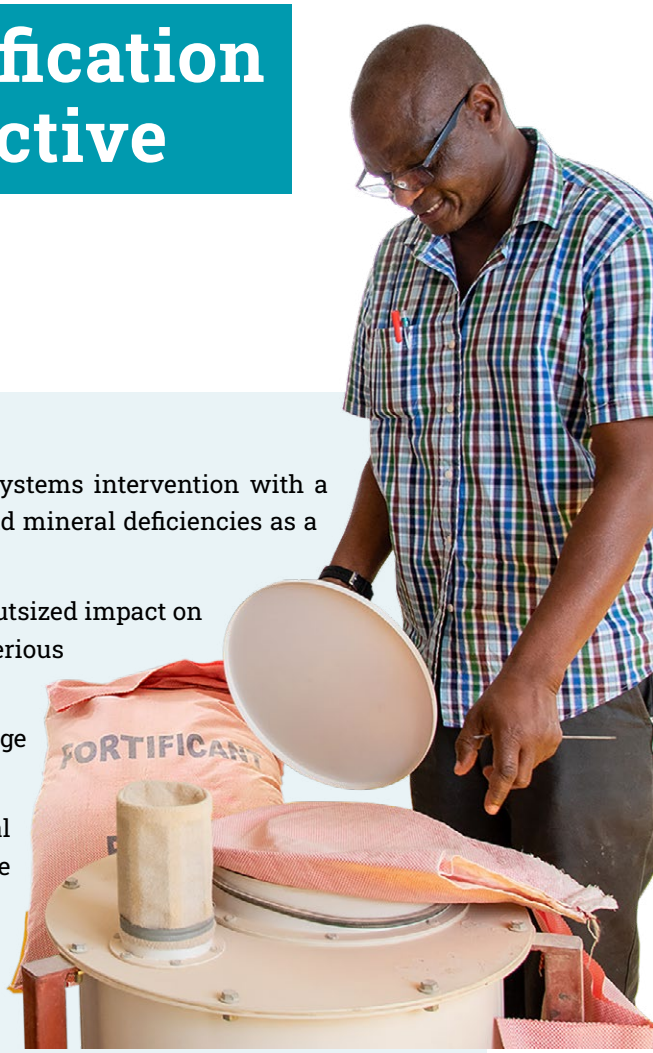
Food Fortification Initiative
Enhancing Grains for Healthier Lives

Future Fortified

gain
Global Alliance for Improved Nutrition

Large-Scale Food Fortification is a Safe and Cost-Effective Strategy to Improve Nutrition



Fortification Improves Lives

Large-scale food fortification is a powerful and established food systems intervention with a proven track record of virtually eliminating debilitating vitamin and mineral deficiencies as a public health concern.

Vitamins and minerals may be "micro" nutrients but they have an outsized impact on human health. Addressing micronutrient deficiencies can prevent serious health consequences:

- Fortifying salt with iodine helps to prevent irreversible brain damage in young children.
- Fortifying flour with iron helps to protect against nutritional anemia and fortifying flour with folic acid helps to prevent severe birth defects like spina bifida.
- Fortifying staples with vitamin A can support eyesight, boost immune systems, and save hundreds of thousands of lives each year.

Large-scale food fortification is not new; starting over a century ago in Europe and North America it has a long history of virtually eliminating diseases like rickets, goiter, pellagra, and beriberi worldwide.

More than 125 low-, middle-, and high-income countries mandate the fortification of maize flour, oil, rice, salt, and/or wheat flour with key nutrients.

Fortification Is Safe

Large-scale food fortification advances the ultimate goal of healthy, safe, accessible, locally produced diets for everyone. Consuming fortified foods improves an individual's overall intake of essential vitamins and minerals, amplifying the success of other health interventions.

When considering folic acid fortification, for example, there is no evidence of adverse consequences resulting from existing mandatory fortification programs that have been implemented in over approximately countries worldwide.[1,2]

When designing a fortification program, national leaders and technical experts work together to assess a population's dietary habits and the most common micronutrient deficiencies. Using this information and guided by the World Health Organization's fortification recommendations, countries set standards that specify the staple food to be fortified and the micronutrients required, their form and bioavailability, and minimum and maximum levels. Countries also create monitoring protocols that help industry and government track and ensure the quality and presence of micronutrients in fortified foods.

1 Martha S. Field, Patrick J. Stover. "Safety of Folic Acid". Annals of the New York Academy of Sciences. 2018.

2 Global Fortification Data Exchange. Map: Count of Nutrients in Fortification Standards. Accessed 17/6/2024 [http://www.fortificationdata.org].

Fortification Is Cost-Effective

Ranked by both the World Bank and the Copenhagen Consensus as one of the most cost-effective development investments, large-scale food fortification costs just pennies per person per year. Large-scale food fortification is a driver of human capital: it improves cognitive development, increases productivity for individuals, and generates economic returns for nations.

Every US$ 1 invested in fortification generates US$ 27 in economic return from prevented disease, improved earnings, and enhanced work productivity (a benefit-cost ratio of 27:1). These economic returns are phenomenal – even when compared with other critical public health interventions, such as vaccination, where the benefit-cost ratio is approximately 16:1.[3]

Benefit-cost ratios of commonly fortified foods

28:1 for iodine in salt[3]

46:1 for folic acid in wheat or maize flour[3]

8:1 for iron in wheat or maize flour[3]

Food producers usually have a one-time expense for equipment to begin fortification. After that, the primary ongoing expense involves purchase of a mix of micronutrients called "premix" to add to foods.

Spotlight on salt iodization:

Global salt iodization demonstrates fortification's positive impact on brain development. After salt iodization was introduced in the United States (1924), IQ increased by approximately 15 points in areas with high levels of iodine deficiency and 3.5 points nationally. The improved iodine status alone from the achievement of salt iodization in 159 countries represents an economic benefit of nearly $32.2 billion annually.[4]

Spotlight on fortifying wheat flour with folic acid:

The cost of adding folic acid to flour is minimal, especially when compared to the cost of treating children with spina bifida.

Chile calculated the costs of surgical treatment and rehabilitative services for a sample of children with spina bifida through 20 years of age. Flour fortification led to an annual net savings equal to US$ 2.3 million.[5] South Africa estimated the costs of treating infants with spina bifida and reported an annual net savings of US$ 5.4 million.[6] The United States included the lifetime costs to care for people with spina bifida plus the value of the time required for others to care for the children. The annual net savings was US$ 603 million.[7]

Country	Cost of fortification (US$/year)	Total direct costs averted (US$/year)	Cost savings (US$/year)
Chile	0.2 million	2.5 million	**2.3 million**
South Africa	0.2 million	5.6 million	**5.4 million**
United States	4–20 million	607.23 million	**603 million**

3 Garrett, G. et al. "Doubling Down on Food Fortification to Fortify the Future." Bill and Melinda Gates Foundation. 2019.

4 Gorstein, J.L., et al. "Estimating the Health and Economic Benefits of Universal Salt Iodization Programs to Correct Iodine Deficiency Disorders." Thyroid : official journal of the American Thyroid Association. 2020.

5 Llanos, A., et. al. "Cost-effectiveness of a Folic Acid Fortification Program in Chile." Health Policy. 2007.

6 Sayed, A., et al. "Decline in the Prevalence of Neural Tube Defects Following Folic Acid Fortification and Its Cost-Benefit in South Africa." Birth Defects Research. 2008.

7 Grosse, Scott, et al. "Retrospective Assessment of Cost Savings from Prevention." American Journal of Preventive Medicine. 2016.