

# Large-scale Food Fortification for the Prevention of Micronutrient Deficiencies in Children, Women and Communities

GUIDANCE NOTE



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# TABLE OF CONTENTS

<b>1. Introduction</b>	<b>4</b>
<b>2. Guide objectives</b>	<b>4</b>
<b>3. What is Large Scale Food Fortification?</b>	<b>4</b>
<b>4. Why is UNICEF prioritizing LSFF as part of the package of preventive actions?</b>	<b>5</b>
<b>5. Integrating LSFF within existing preventive nutrition interventions</b>	<b>5</b>
<b>6. LSFF principles</b>	<b>6</b>
<b>7. Considerations for strategic actions to support LSFF</b>	<b>7</b>
<b>8. Large-Scale Food Fortification programming cycle</b>	<b>7</b>
<b>ANNEX I</b>	<b>13</b>
<b>ANNEX II</b>	<b>14</b>

# LARGE-SCALE FOOD FORTIFICATION FOR THE PREVENTION OF MICRONUTRIENT DEFICIENCIES IN CHILDREN, WOMEN AND COMMUNITIES

## GUIDANCE NOTE



### 1. Introduction

*This document is intended to serve as guidance for UNICEF regional and country offices as they support governments to plan and implement large-scale food fortification (LSFF) programmes for the prevention of micronutrient deficiencies in children, women and communities. It is intended to be used primarily by UNICEF country office staff, but it can also serve as a tool for governments and agencies engaged in LSFF programmes. The actions recommended are based on existing global evidence and guidelines. Country offices will select the interventions most relevant to their country context and situation. This guidance note will be updated as new evidence and experiences emerge.*

**Guiding principle:** UNICEF recognizes LSFF as an effective and proven intervention to improve micronutrient intake and address micronutrient

deficiencies as part of a broader nutrition strategy to improve poor diets using a food systems approach. The [UNICEF Nutrition Strategy 2020–2030](#) prioritizes better foods and diets for children through food supply chain actions, including **mandatory LSFF**. This includes strengthening salt iodization programmes and the fortification of wheat flour, rice, and cooking oil, and other context-relevant forms of LSFF to improve the dietary quality and nutritional status of children, adolescents and women.<sup>1</sup>

LSFF programmes should complement the promotion of access to and consumption of nutritious, safe, diverse and affordable diets. This guidance note is an extension of the approach outlined in the UNICEF Nutrition Strategy and the UNICEF Vision and Approach to Large-Scale Food Fortification, which propose priority actions at national, regional and global level to

<sup>1</sup> The food intakes of younger children are much lower, and as such, LSFF does not make a significant impact on their nutritional status.

improve food systems for the purpose of delivering nutritious diets.

## 2. Objectives of this guidance note

- To describe the scope of the UNICEF LSFF programme and the process and steps required to design, implement, monitor and evaluate a LSFF programme.
- To provide programme staff with a thorough list of resources to help them delve further into particular LSFF programme pathway components.

## 3. What is large-scale food fortification?

LSFF<sup>2</sup> refers to the process whereby one or more essential micronutrients are deliberately added to staple foods or condiments during processing to improve their micronutrient composition. Also referred to as mass fortification, LSFF is a nutrition-specific intervention that is typically initiated, mandated and regulated by governments to prevent micronutrient deficiencies, especially in vulnerable populations. LSFF is also applicable to foods provided during emergencies.

Basic commodities, such as flour, oil, salt, sugars, and condiments, are typically chosen as the vehicles for LSFF due to their widespread and regular consumption. The primary food vehicles and the specific vitamins and minerals that can be incorporated are listed in Annex 1.

**Fortificants** are defined as the source of micronutrients, while micronutrient **premixes** refer to a blend/mixture of fortificants that are added to a food vehicle. Numerous factors must be taken into consideration, including the concentration of the fortificant (to ensure that it is both efficacious and safe), its absorptive properties, its stability and how it will affect the sensory qualities of the food vehicle chosen.

LSFF is promoted as a cost-effective strategy for improving micronutrient intake and reducing micronutrient deficiencies among the entire population, particularly when food is processed centrally, and when existing technologies and distribution networks are

effectively leveraged. This is in contrast to fortification interventions that target a particular subset of the population, such as small-quantity lipid nutrient supplements, fortified complementary foods, and home fortification (whereby soluble or crushable tablets, micronutrient powders or micronutrient-rich spreads are added to foods at the household level). Supplementation, usually in the form of pills, capsules and syrups, is another public health intervention aimed at reducing micronutrient deficiencies.

LSFF have a proven track record of success over the past 50 years. Globally, 147 countries mandate or allow salt iodization, virtually eliminating iodine deficiency and goitre in much of the world. Further, 92 countries have implemented cereal grain fortification programmes and more than 30 fortify edible oil, reducing the prevalence of deficiencies in folate, iron, vitamin A, vitamin D and zinc, especially where these programmes are mandatory, well-implemented and enforced. Still, a large unfinished agenda on food fortification remains, and further scale-up is needed to improve the reach and quality of LSFF and realize its full potential in the prevention of micronutrient deficiencies.

## 4. Why is UNICEF prioritizing LSFF as part of the package of preventive actions?

Micronutrient deficiencies are key contributors to the global burden of disease; they represent a significant proportion of the morbidity and mortality suffered by women of reproductive age and children in low- and middle-income countries.<sup>3</sup> They also constrain child growth and development and undermine national development.<sup>4</sup>

Most micronutrient malnutrition is caused by poor diets and impaired nutrient absorption or utilization due to infection or parasitic infestation, which also increase metabolic needs for many micronutrients. Poverty is a fundamental factor underlying micronutrient malnutrition and is often linked to insufficient consumption of a diverse range of foods, limited awareness of safe food handling and feeding practices, and inadequate access to safe water, sanitation, and hygiene practices. Micronutrient deficiencies affect

2 Large-scale food fortification (LSFF) is a key part of the response to the crisis of malnutrition, adding one or more essential nutrients to widely and regularly consumed foods during processing. "Large-scale" refers to the objective of reaching a large segment of the population that would be consuming the target food vehicle on a regular basis and not to be confused with the size of the food processors.

3 Brown, K. H., Moore, S. E., Hess, S. Y., McDonald, C. M., Jones, K. S., Meadows, S. R., Manger, M. S., Coates, J., Alayon, S., & Osendarp, S. J. M. (2021). Increasing the availability and utilization of reliable data on population micronutrient (MN) status globally: The MN Data Generation Initiative. *The American Journal of Clinical Nutrition*, 114(3), 862–870. <https://doi.org/10.1093/ajcn/nqab173>

4 HLPE Nutrition and food systems. A report by the High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security; Rome; 2017.

all communities across low-, middle- and high-income countries.

LSFF should be implemented as part of a comprehensive approach to address micronutrient deficiencies, alongside other strategies such as improving dietary diversity through agricultural practices that enhance the availability of and access to nutritious foods, while improving the affordability of nutritious foods.

Specific fortification practices and regulations can vary between countries, as they depend on local dietary patterns, nutrient deficiencies, and regulatory frameworks. Consultation with public health authorities, nutrition experts, and food industry stakeholders is crucial for designing and implementing effective fortification programmes.

## 5. Integrating LSFF within existing preventive nutrition interventions

While LSFF is primarily a food system intervention, it is important to appreciate its linkages with education, health, and social protection systems and the principles that guide equitable nutrition programming for all. UNICEF's actions in nutrition are governed by the following programming principles, which call for nutrition programmes to be: rights-based; equity-focused; gender-responsive; context-specific; evidence-informed; and systems-centred.

## 6. LSFF principles

When implementing LSFF, several guiding principles can help ensure its effectiveness and sustainability:

- i. **Evidence-based approach:** LSFF programmes should be based on robust scientific evidence and data, including on the prevalence and severity of micronutrient deficiencies, dietary patterns, and consumption habits of the target population, or have a strong public health justification for seeking additional evidence.
- ii. **Targeted and equitable reach:** LSFF should aim to reach populations most at risk of micronutrient deficiencies, including vulnerable groups such as pregnant women, children, and low-income individuals. Efforts should be made to ensure equitable access to fortified foods, addressing social and economic disparities. This precludes the use of food vehicles not consumed by populations in need and prioritizes the food vehicles most widely consumed.
- iii. **Programming at scale:** Food vehicles that are industrially processed and scalable should be considered for fortification, such as wheat flour, rice, oil, maize flour and salt.
- iv. **Base programming on an analysis of optimal mix:** The choice of food vehicles and fortificants should a) contribute to better nutrition and avoid exacerbating obesogenic environments; b) minimize the risk of toxicity due to excess intake of fortificants; and c) reflect the country context.
- v. **Do no harm:** Programmes must avoid causing harm, including by acts of omission (i.e., neglecting to inform the population about all added ingredients). Over-consumption of any food product is not promoted.
- vi. **Public health driven theory of change:** LSFF programmes should articulate the various steps and stages needed to achieve sustainable public health impact. For example, the approach should begin with a comprehensive diagnosis of country context to determine whether LSFF is an appropriate intervention before moving onto subsequent steps, such as determining the actual cost of implementing the programme in a sustainable manner.
- vii. **Sustainability and long-term commitment:** Building industry and government long-term capacity to take ownership of LSFF programmes and supporting adequate financial resource allocation, political commitment, and a strong policy framework are necessary to ensure the continuity and long-term success of fortification efforts.
- viii. **Continuous improvement and innovation:** LSFF programmes should embrace continuous improvement and innovation. Regular research and technological advancements can help optimize fortification methods, address emerging nutritional challenges, and explore new opportunities for enhancing the nutritional impact of fortified foods.

### Programme-specific guiding principles

- i. **Collaboration and partnerships:** Collaboration among government agencies, international organizations, the private sector, civil society, and relevant stakeholders is crucial for the success of LSFF programmes. Partnerships can help mobilize resources, ensure regulatory compliance, and

support implementation, monitoring, and evaluation efforts.

- ii. **Quality assurance and control:** Stringent quality assurance measures should be in place to ensure that fortified foods meet specified nutrient levels. Regular testing, quality control checks, and compliance monitoring are essential to maintain the desired nutrient content throughout the production and distribution processes.
- iii. **Consumer acceptance and awareness:** Social and behaviour change interventions for fortified foods should be integrated into programmes, if needed, to inform consumers about the benefits of fortified foods, address potential misconceptions, and prevent rejection by consumers. These endeavours, however, are more relevant when fortified foods have undesirable sensory qualities (e.g., an unusual colour) and less relevant in contexts where fortification is mandated and the legislation is enforced effectively.
- iv. **Adherence to safety standards:** Fortified foods should comply with relevant food safety regulations and standards to ensure consumer safety. Programmes should integrate and promote adequate measures to ensure the integrity and nutritional quality of the fortified products.

## 7. Considerations for strategic actions to support LSFF

Based on LSFF programme implementation experiences, below are some general 'dos' and 'don'ts' to consider in supporting LSFF programmes. These should be considered as general guidelines that can be adapted to the specific context and the needs of each LSFF programme. Taking these lessons into account can help optimize programme implementation and increase the effectiveness of LSFF in addressing micronutrient deficiencies.

### **Dos:**

- Facilitate the harmonization of fortification requirements and the development of regional standards for fortification, where applicable, to facilitate trade.
- Advocate for mandatory fortification of staple food and condiments within the strategies and workplans of regional governing and trading blocks.
- Assist governments to fully assess and evaluate the appropriateness of potential food vehicles in terms of consumption patterns, industry structure,

fortification feasibility, and evidence for the efficacy of fortification, etc.

- Support governments to identify the most relevant platforms – such as open markets or social protection programmes – for reaching populations at large, including the most vulnerable, in an effective manner.
- Advocate for legislation and fortification requirements with a focus on developing enduring political commitment and an understanding of the need to enforce legislation and fortification requirements.
- Advocate with government for industry incentives for fortification, such as tax exemptions for equipment and fortificant imports, fortificant procurement mechanisms and supportive regulations on nutrient claims.
- Support government to integrate effective monitoring activities for enforcement into existing food control activities to enforce food fortification requirements.
- Encourage governments to identify ongoing surveillance systems or routine surveys in which assessments of population coverage and/or health impact assessment can be integrated.
- Promote coordination and collaboration among stakeholders, preferably through existing structures, in line with other nutrition or national development interventions.

### **Don'ts**

- Do not support and/or facilitate voluntary fortification.
- Do not encourage government to require fortification by small-scale food industries with poor capacity to fortify and for whom it would be hard to monitor for compliance.
- Do not fund or purchase inputs for fortification, such as fortification equipment and fortificant, or fund routine activities, such as external regulatory monitoring.
- Do not suggest to industry that fortification will increase sales and/or market share. Good fortification vehicles are already widely consumed and increased consumption is unlikely and often not desired.
- Do not encourage or support government to monitor and enforce fortification at retail or household level.
- Do not support or encourage efforts to engage in “social marketing” or to “create consumer demand” as consumer demand is not needed in the context of mandatory fortification.

## 8. Large-scale food fortification programming cycle

As UNICEF engages diverse partners, including government counterparts, industry, other private sector actors, and civil society organizations, it is important to appreciate the broad and systemic food system challenges that must be overcome by country-led efforts to advance LSFF programming.

LSFF programming is influenced by and embedded within food systems, which are made up of people, institutions, environments, infrastructure and activities that relate to the production, processing, distribution, marketing, sale, preparation and consumption of food. These food systems are complex and offer many entry points for change through tasks that can be modified or combined to make programming more effective, acceptable and feasible. The diverse tasks, involving various food systems actors, are associated with different phases of the LSFF programming framework.

Several LSFF programming frameworks have been published by fortification-supporting agencies or individuals. Nutrition International and Food

Fortification Initiative, with support from other relevant fortification partners, including UNICEF, designed a novel Blueprint for Fortification Programming, which is a seven-stage pathway to guide fortification planning and programming.

The activities included under each of these seven stages are not necessarily meant to be sequentially performed, since countries may be at different stages of the LSFF programming cycle. A detailed description of the Blueprint phases and activities can be found in Table 1. The phases and list of activities are to be used as a guide for programme officers in designing national LSFF programmes, which should ideally be supported by governments for sustainability.

Country office support should be aligned with its capacity and tailored to the country's context. As a result, it is vital to define the priority tasks in each phase based on the information gathered, the resources required, and the timescale, ensuring alignment with [UNICEF's Vision and Approach to Large-Scale Food Fortification](#).





**Table 1. Food Fortification Blueprint**

Stage	Tasks/Actions (catalogue of additional tools and resources are listed in Annex II)
1. Justify	<p><b>a. Identify need and relevance of fortification, and assess fortification as part of an optimal mix of interventions.</b></p> <ul style="list-style-type: none"> <li>→ Identify country nutrition champions, including professionals and institutions within the country with knowledge, credibility, and experience in public health nutrition who can champion or influence fortification programming in-country.</li> <li>→ Determine the micronutrient gap by obtaining up-to-date micronutrient deficiency data and assessing the target population’s dietary intake and the contribution of existing micronutrient interventions to establish the need to improve population nutrient intake for specific vitamins and minerals. Look at latest data from national micronutrient surveys and household surveys, such as Multiple Indicator Cluster Surveys (MICS) and Demographic and Health Surveys (DHS), and review any food consumption data from the Food and Agricultural Organization of the United Nations (FAO) Food Stat, FACT surveys, dietary recall studies, household food and expenditure surveys.</li> <li>→ Map the micronutrient deficiencies pattern to ascertain the target population in need (including determining which demographic and geographic groups are affected by micronutrient deficiencies). Identify other current micronutrient interventions in place and model the contribution of fortification / fortified foods vis-à-vis other micronutrient interventions to diets and to reducing micronutrient inadequacies. Determine the sufficiency of existing micronutrient strategies to address the identified nutritional need, demonstrate that fortification can fill nutritional gaps while complementing other nutrition-specific interventions, and assess regional fortification efforts and implications nationally.</li> </ul> <p><b>b. Demonstrate feasibility of fortification.</b></p> <ul style="list-style-type: none"> <li>→ <b>Identify appropriate vehicle(s)</b> based on knowledge of the target population obtained in step ‘1a’ and considering the “5 Cs”: coverage, cost, consumption, central processing, compatibility, as well as physiological availability, presence of inhibitors in the diet, and flour extraction rates.</li> <li>→ <b>Once potential food vehicles have been identified, conduct an assessment of:</b> (i) the industry, including threats/limitations, milling and production infrastructures, reach, and readiness of production facilities; (ii) food processors, brands, market share, and their compliance or conformity with food fortification standards adopted by the country (where available), which can be obtained via market surveys and data from regulatory agencies; and (iii) the market, including a review of storage conditions. A supply chain diagnostic should also be conducted of countries’ main trading partners, including how much food is imported, locally manufactured or exported, as well as an economic analysis.</li> </ul> <p><b>c. Provide justification for fortification.</b></p> <ul style="list-style-type: none"> <li>→ <b>Build a case to present to government</b> (based on the evidence collected above on need, relevance, and feasibility), that justifies the inclusion of fortification within the national nutrition strategy and/or implementation plans.</li> </ul>

Stage	Tasks/Actions (catalogue of additional tools and resources are listed in Annex II)
2. Galvanize	<p><b>a. Map fortification stakeholders and gather political will.</b></p> <ul style="list-style-type: none"> <li>→ <b>Identify all government stakeholders</b> that will be involved in a fortification programme to gauge existing capacity and the gaps that need to be filled.</li> <li>→ <b>Determine all partner organizations</b> providing nutrition-specific and nutrition-sensitive support to the government and build partnerships/alliances to harmonize messages to government.</li> <li>→ <b>Assess the added value of additional external partner support</b> for fortification based on technical abilities, budgets, timelines, and mandates.</li> <li>→ <b>Identify fortification champions</b>, which ideally include <b>individuals who can advocate for fortification in the country</b>. Champions could be, but are not limited to, a political appointee, celebrity, or members of civil society, such a neurosurgeon or an academic.</li> </ul> <p><b>b. Build partnerships/alliances.</b></p> <ul style="list-style-type: none"> <li>→ <b>Identify all stakeholders</b>, including but not limited to producers, civil society (e.g., consumer groups, parent and physician groups), necessary government agencies including regulatory bodies, academia, and external partners.</li> <li>→ <b>Engage food producers</b>, including via consultation with food producers regarding the scope of legislation, standards, implications on regional trade, and implementation timelines.</li> <li>→ <b>Conduct a political readiness assessment and obtain permission and willingness of government to move forward</b>, including by making a formal presentation to the relevant government body that recommends effective staples and market channels based on diagnostic results.</li> <li>→ <b>Support the relevant government agency to establish a plan and move to the next phase:</b> the primary actions government will need to take include (i) drafting a policy; (ii) passing legislation; (iii) inspecting, auditing, and enforcing; (iv) coordinating/overseeing and maintaining the programme long-term; and (v) assessing and evaluating. Each action is vital to the success of the programme, and different sectors of government will be responsible for each action.</li> </ul> <p><b>c. Support national budgetary inclusions.</b></p> <ul style="list-style-type: none"> <li>→ <b>Outline costs</b>, including expected one-time and recurring government costs required for the programme.</li> <li>→ <b>Initiate high-level discussions</b> that include a line item for fortification in fiscal year budgets. Discussions should outline one-time and recurring costs and establish the paying entity for each activity. The budget should include requirements for routine monitoring and alliance meetings and may also include surveillance/impact work.</li> </ul> <p><b>d. Support political, private, and civic sector advocacy.</b></p> <ul style="list-style-type: none"> <li>→ <b>Assess the type of targeted advocacy</b> that may be needed, including advocacy towards the civic sector, ministerial level, private sector and/or consumers. <ul style="list-style-type: none"> <li><b>i. Civic sector:</b> Engage neurosurgeons, consumer associations, parent groups, political groups, local leaders, and academics. This includes engaging with civil society to support LSFF and hold both government and the food industry accountable. It also includes supporting the full representation and participation of the civic sector in the national LSFF coordination body and other relevant nutrition forums and initiatives.</li> <li><b>ii. Ministerial level:</b> Advocate across line ministries, including health, finance, education, agriculture, industry, trade, and commerce, guided by cost-effectiveness analyses (outlined in 1b), if appropriate.</li> <li><b>iii. Private sector:</b> Engage food producers, industry associations and other private sector entities. Demonstrate to the private sector its potential contribution (as part of corporate social responsibility) to national-level nutritional and economic impacts and assess perceived barriers to implementation by the private sector.</li> <li><b>iv. Consumers:</b> Assess consumer perceptions of fortification, address any misconceptions, and outline cost implications for consumers.</li> </ul> </li> </ul>

Stage	Tasks/Actions (catalogue of additional tools and resources are listed in Annex II)
	<p><b>e. Align national programmes with global/regional efforts and guidance bodies.</b></p> <ul style="list-style-type: none"> <li>→ <b>Engage regional bodies</b>, such as the Caribbean Community, the East, Central and Southern Africa (ECSA) Health Community, the Southern African Development Community (SADC) and the Economic Community of West African States (ECOWAS), to obtain support as needed for implementation.</li> <li>→ <b>Ensure harmonization with</b> global guidelines, regional standards, or neighbouring countries.</li> <li>→ <b>Advocate for the inclusion of fortification within the work of the Scaling Up Nutrition movement</b> or other national/regional/global nutrition efforts.</li> </ul>
3. Enable	<p><b>a. Support drafting of the fortification policy.</b></p> <ul style="list-style-type: none"> <li>→ Support the government to <b>adopt a national fortification policy</b> as a stand-alone policy or strategy, or integrate such a policy within an existing national nutrition or micronutrient policy or strategy. A national fortification policy or strategy does not necessarily need to be formalized prior to the adoption of relevant legislation but the process of formalization should be initiated at this early stage of programming.</li> </ul> <p><b>b. Support drafting of the fortification legislation.</b></p> <ul style="list-style-type: none"> <li>→ <b>Map the legislative process for a mandatory fortification programme</b> and support efficient enactment of the legislation.</li> <li>→ <b>Address potential communication gaps</b> between industry leaders and public sector leaders that can result in legislation and standards that restrict, rather than enable, private sector investment in fortification.</li> </ul> <p>Legislation (and standards) for fortification should be within the national food control system, rather than a 'stand-alone' intervention. The food control system sets basic requirements for food quality and safety; fortification should be legislated as a component of this system to facilitate implementation, enforcement, and sustainability.</p> <p><b>c. Establish fortification requirements included in food standards or food regulations.</b></p> <ul style="list-style-type: none"> <li>→ <b>Ensure alignment of the formulation of premix</b> and specific nutrient levels and ranges intended to fill the identified nutritional gaps with up-to-date consumption data.</li> <li>→ <b>Ensure harmonization of fortification standards</b> with existing interventions/policies and regional fortification standards. Standards should include up-to-date guidance on the most appropriate fortificant forms and methods to establish realistic target levels and ranges.</li> <li>→ <b>Include all relevant stakeholders in the standards setting process</b> and ensure that regulations are enforceable in the context.</li> </ul> <p>Standards (and legislation) for fortification should be requirements within the national food control system rather than a 'stand-alone' intervention. The food control system sets basic requirements for food quality and safety; fortification standards should be a component of this system to facilitate implementation, enforcement, and sustainability.</p> <p><b>d. Identify/establish inspection, audit, and enforcement opportunities within the existing food control system.</b></p> <ul style="list-style-type: none"> <li>→ <b>Agree upon and draft realistic guidelines</b> for government inspection, auditing, and enforcement to ensure compliance with national standards, including effective incentives and penalties for production of fortified foods and for the production of compliant fortified foods; and establish linkages with food safety.</li> </ul>

Stage	Tasks/Actions (catalogue of additional tools and resources are listed in Annex II)
4. Operationalize	<p><b>a. Identify industry scale-up support and ensure strong quality assurance and quality control protocols (e.g., internal monitoring), including quality premix and equipment.</b></p> <ul style="list-style-type: none"> <li>→ <b>Secure technical support to industry</b> in the scale-up of fortification, including (i) sourcing, installation, and maintenance of proper equipment; (ii) sourcing and importation of quality premix; and (iii) creation of strong quality assurance and quality control systems.</li> <li>→ <b>Continue to engage industry</b> associations and continue to involve industry in discussions concerning legislation, standards, monitoring, and implementation timelines.</li> <li>→ <b>Broker dialogue</b> between government and food industry.</li> </ul> <p><b>b. Explore effective business models for food producers.</b></p> <ul style="list-style-type: none"> <li>→ <b>Determine models to incentivize</b> producers/businesses to fortify food,</li> <li>→ assess potential approaches that could be used to create consumer demand, and examine the feasibility and structure of potential tax breaks.</li> <li>→ <b>Ensure that premix and fortification equipment are included as duty-free products nationally.</b></li> <li>→ <b>Make attempts to address foreign exchange issues</b>, if relevant.</li> <li>→ <b>Explore operational efficiencies</b> to offset fortification costs.</li> <li>→ Engage financial institutions to support improved access to finance and financial terms for the food industry to achieve food fortification.</li> </ul> <p>These efforts should be explored even in light of mandatory legislation for fortification, in order to ensure an enabling environment for food producers.</p> <p><b>c. Ensure a level playing field for industry.</b></p> <ul style="list-style-type: none"> <li>→ <b>Assess the type of consumer advocacy</b> that government is willing to undertake once industries commence fortifying food.</li> <li>→ <b>Determine the means</b> by which government can ensure that communities are accepting fortified food.</li> </ul> <p>The private sector can communicate the consumer benefits of specific products, but the public sector can more credibly communicate the health and national development benefits.</p>
5. Monitor	<p><b>a. Establish and strengthen monitoring systems.</b></p> <ul style="list-style-type: none"> <li>→ <b>Train inspectors to assess</b> process monitoring, conduct audits, lead end-product inspections, and carry out enforcement measures within food production facilities, as outlined in national monitoring guidance documents.</li> </ul> <p>If food safety inspectors/inspections do not have capacity or if food safety inspectors/inspections do not exist within a country, <b>determine alternative means of retrieving compliance information</b>, including the potential roles of consumer groups and existing national databases in providing said information.</p> <p><b>b. Capacitate civil society to hold industry accountable.</b></p> <ul style="list-style-type: none"> <li>→ Capacitate consumer groups, parent groups (i.e., spina bifida associations), and/or academia to assess fortified products sold in the market for compliance with national standards, as necessary and appropriate.</li> </ul> <p><b>c. Strengthen laboratories.</b></p> <ul style="list-style-type: none"> <li>→ Ensure designated national or regional labs have the necessary infrastructure and capacity to quantitatively or qualitatively test for nutrients in food.</li> </ul>
6. Evaluate	<p><b>a. Support integration of key indicators into ongoing national surveys.</b></p> <ul style="list-style-type: none"> <li>→ Incorporate relevant fortification, micronutrient, and food coverage and consumption indicators into relevant national surveys such as national DHS, as a means to gauge changes in nutritional status or consumption patterns throughout the duration of the programme.</li> </ul> <p><b>b. Capacitate academic institutions.</b></p> <ul style="list-style-type: none"> <li>→ Strengthen and commission academic institutions to conduct and support surveys, surveillance, analysis, and impact studies.</li> </ul>

Stage	Tasks/Actions (catalogue of additional tools and resources are listed in Annex II)
7. Review and reassess	<p><b>a. Review the relevance and appropriateness of fortification standards and programme design (in light of national changes and regional or global recommendations) and make adjustments as necessary.</b></p> <p>→ Programme managers should review the overall design of the fortification programme every five years, including fortification requirements in food standards, to coincide with the formulation of national nutrition and health plans and/or with national changes in dietary patterns, nutritional deficiencies, environmental health, production capacity and profiles, or implemented nutrition programmes.</p> <p>i. The review should include efforts to generate evidence and sustain political will, as necessary.</p> <p>ii. Programme managers should view fortification programmes as dynamic and under constant evolution with the ability to respond to contextual changes.</p> <p>iii. The review of fortification programme design, including fortification standards, should be led by the in-country 'home' ministry or agency of the programme.</p>
Cross-cutting themes	<p><b>a. Foster accountability.</b></p> <p>→ If the fortification programme receives external support, <b>focus should be placed on the design, advocacy, and establishment of programming guidelines.</b></p> <p>→ <b>Structures should be established</b> in the country that allow for ownership of the programme, including appropriate budget allocations, knowledge of programming aspects, and champions to advocate for fortification during political turnover/transitions.</p> <p><b>b. Integrate fortification within existing national systems.<sup>5</sup></b></p> <p>→ Integrate the mandatory fortification of staple foods into existing systems and structures to ensure sustainability. This integration includes (i) fortification as part of national nutrition strategies or policies; (ii) fortification legislation under the national food act or equivalent; (iii) fortification requirements embedded into national food standards; (iv) premix included on duty-free importation lists; (v) inspections, audits, and enforcement conducted through routine food control or safety protocols; (vi) ongoing fortification maintenance costs accounted for in national budgets; and (vii) fortification programme indicators integrated into routine national surveys.</p> <p><b>c. Support the creation of academic curricula on fortification.</b></p> <p>Ensure that nutrition programmes within academic institutions cover the purpose, components, methods, and impact of fortification programming.</p> <p><b>d. Establish mechanisms that favour financial self-sustainability.</b></p> <p>These mechanisms may include components that ensure the purchase of duty-free premix and fortification equipment, and a commitment to use funds generated from these taxed items (if not declared duty-free) for monitoring the food industry and enforcing compliance to national fortification standards.</p>

5 Although this component is embedded throughout specific Blueprint activities outlined above, including references to tools and resources to further enable institutionalization of fortification, it is worth emphasizing this component again as a cross-cutting theme that programme managers should consider throughout programme planning and implementation.

# ANNEX I

**Table 2: Potential food vehicles and micronutrients with which they can be fortified**

<b>Food vehicle</b>	<b>Vitamins and minerals (fortificants) that can be added</b>
<b>Wheat flour</b>	Iron, zinc, selenium, vitamins A, D, B1 (thiamine), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), B9 (folate or folic acid), and B12 (cobalamin)
<b>Maize flour</b>	Iron, zinc, vitamins A, D, B1 (thiamine), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), B9 (folate or folic acid), and B12 (cobalamin)
<b>Rice</b>	Iron, zinc, selenium, vitamins A, D, B1 (thiamine), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), B9 (folate or folic acid), and B12 (cobalamin)
<b>Oil</b>	Vitamins A, D, and E
<b>Salt</b>	Iodine and, under special cases, fluoride, iron and folic acid
<b>Milk</b>	Vitamins A, D, iron, and folic acid

## ANNEX II

**Table 3: Catalogue of tools and resources to support LSFF (check all links)**

<p><b>Assess/ describe</b></p>	<ul style="list-style-type: none"> <li>• Coverage and impact data for other micronutrient interventions, such as the <a href="#">Fortification Assessment Coverage Toolkit</a> (FACT)</li> <li>• <a href="#">Micronutrient Survey Manual and Toolkit</a>, which includes resources to help assess and monitor vitamin and mineral deficiencies</li> <li>• National-level surveys (i.e., DHS, MICS, Household Income and Expenditure Surveys, National Nutrition Surveys)</li> <li>• WHO <a href="#">Vitamin and Mineral Nutrition Information System</a></li> <li>• <a href="#">Micronutrient Action Policy Support</a></li> <li>• Consumption and/or coverage data:             <ul style="list-style-type: none"> <li>» <a href="#">World Bank Living Standards Measurement Survey</a> microdata library</li> <li>» <a href="#">International Household Survey Network</a></li> <li>» <a href="#">FAO/GIFT</a> for country-specific food consumption data</li> <li>» <a href="#">Fortification Rapid Assessment Tool</a></li> <li>» <a href="#">Global Fortification Data Exchange</a></li> <li>» <a href="#">WHO/Centers for Disease Control and Prevention e-Catalogue</a> (quality, coverage, biological indicators, process indicators)</li> </ul> </li> <li>• Supply chain assessment:             <ul style="list-style-type: none"> <li>» <a href="#">Example supply chain diagnostic template for rice</a></li> <li>» <a href="#">Cost Benefit Analysis Tool for wheat flour and cooking oil.</a></li> </ul> </li> </ul>
<p><b>Analyse/ diagnose</b></p>	<ul style="list-style-type: none"> <li>• <a href="#">Example of partner mapping assessment</a></li> <li>• <a href="#">‘What is a National Fortification Alliance?’</a></li> <li>• <a href="#">Advocacy Toolkit</a> for individuals advocating for fortification as a means of preventing brain and spine birth defects in Africa (which can be adapted for use in other regions)</li> <li>• Food Fortification Initiative <a href="#">Fortification Advocacy Toolkit</a> and <a href="#">Workbook</a></li> <li>• <a href="#">ECOWAS harmonized regional fortification standards</a></li> <li>• ECSA Health Community <a href="#">wheat flour</a>, <a href="#">maize flour</a>, and <a href="#">edible fats</a> fortification standards</li> <li>• <a href="#">ECSA Inspection Guidelines</a></li> <li>• <a href="#">SADC Minimum Standards for Fortification</a></li> </ul>
<p><b>Act/ decide</b></p>	<ul style="list-style-type: none"> <li>• Example fortification and micronutrient policies or strategies: <a href="#">Kenya Food Fortification Policy Brief</a>   <a href="#">Tanzania Fortification Action Plan</a></li> <li>• <a href="#">2018 Regulatory Monitoring Policy Guidance Document</a></li> <li>• <a href="#">Basic Checklist for Fortification Practice</a></li> <li>• <a href="#">Food Fortification Initiative Flour Miller’s Toolkit</a></li> <li>• <a href="#">Rice Miller’s Toolkit</a></li> </ul>

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