



Africa Maize Fortification Strategy

2017-2026



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LIST OF ACRONYMS

AUC	African Union Commission
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
ECOWAS	Economic Community of West African States
ECSA-HC	Eastern and Central African Health Secretariat
FAO	Food and Agricultural Organization
FFI	Food Fortification Initiative
FORTIMAS	Fortification Monitoring and Surveillance
GAIN	Global Alliance for Improved Nutrition
IEC	Information Education and Communication
KU	Kansas University
NGO	Non-Government Organization
QAQC	Quality Assurance and Quality Control
SADC	Southern African Development Cooperation
SME	Small and Medium Enterprises
SOP	Standard Operating Procedures
UEMOA	Union Economique et Monetaire Ouest Africaine
WHO	World Health Organization



STATEMENT

We, the representatives of government and grain milling sector from Benin, Burundi, Burkina Faso, Kenya, Malawi, Namibia, Mozambique, Rwanda, Tanzania, Togo, South Africa, Uganda, Zambia, Zimbabwe, and their development partners met in Dar-es-Salaam, Tanzania from 3 October 2016 to 7 October 2016, deliberated among others, on the need to strategize on scaling up of maize flour fortification program in these countries as a vehicle to reducing micronutrient malnutrition by preparing an Africa Maize Fortification Strategy.

Even though salt fortification, vegetable oil fortification, sugar fortification and wheat flour fortification are being implemented, maize fortification needs special attention to be stepped up.

We all commit ourselves to adopt and adapt this strategy to our country specific contexts to fully eradicate micronutrient malnutrition on the face of Africa.

Read the full text of the Statement:

http://ffinetwork.org/about/calendar/2016/documents/Maize_statement.pdf

EXECUTIVE SUMMARY

The Africa maize flour/meal fortification strategy aims to assist the participating countries to achieve the agreed action items within reasonable timelines, review progress to be made and solicit for any external intervention that may be required in scaling up maize fortification.

International laws, notably, the United Nations Charter, continental, regional and national laws bind all governments to afford adequate food and nutrition security to all its citizens as fundamental right.

Micronutrient deficiencies are still visible and prevalent in all African states, albeit at varying extents, taking serious toll on the health and economic development of the generality of its populace, particularly, women and children, by causing stunted growth, anaemia, birth defects like spina bifida.

Maize is a staple food daily and widely consumed by the African nation and is an instrumental food vehicle for delivering micronutrients to the at-risk population especially in the rural Africa, who do not have the resources and means to purchase wheat flour and baked products made with wheat flour.

Several countries have put in legislation and developed standards that make maize fortification mandatory and enforceable. Implementation has been painfully slow due to several challenges/barriers. Other countries are currently fortifying maize on voluntary basis and slowly transiting to a mandatory phase. However, very little, public awareness campaigns have been undertaken to educate consumers, millers, policy makers to promote maize fortification.

To address the above constraints, the following strategic directions have been identified for implementation by participating countries:

- Large scale industrial maize mills alone are not covering a large proportion of the population, medium and small scale roller/hammer mills that commercially package their flour should be supported to fortify with vitamins and minerals per the national standards.
- Scale up fortification of commercial packaged maize flour/meal by large, medium, and small scale (roller/hammer) mills to reach all consumers through developing innovative approaches to make it possible for commercial packaging SMEs to mill and fortify while creating awareness campaigns.
- Adopt a multi-sectoral coordination approach involving commercial packaged maize flour/meal fortification as led by grain millers' associations, large, medium, and small roller/hammer millers for ownership/sustainability within their respective governments in ensuring that maize flour/meal fortification program succeeds in their countries.
- Countries that are in the voluntary stage should endeavour to enact enabling legislation that will regulate and enforce maize meal/flour fortification as per their national standards.
- Appropriate technologies that are customized, efficient, affordable, and sustainable for maize flour/meal fortification be developed and provided by suppliers to commercial packaged maize millers.
- There was general agreement that the flour produced from home-grown maize brought by the consumer to a toll mills or fee-for-service mills that do not package the flour is not fortifiable for the near future. Other strategies such as multiple micronutrient powder sachets ("sprinkles") will be needed to provide essential vitamins and minerals to people in the rural areas who have no access to packaged and fortified maize flour.
- Continued lobbying/advocacy for maize flour/meal fortification be undertaken and persuaded vigorously at political and economic institutions such as civil Society's, SADC, AUC, COMESA, UEMOA, EAC, ECSA-HC, ECOWAS, WHO, to scale-up maize flour/meal fortification.
- Governments, private sectors, academic institutions, and developmental partners should as resources permitting, continue to harness, and nurture the maize flour/meal fortification models and program across Africa.

The strategy is not cast in stone. It only provides strategic direction for countries in preparing their national strategies and action plans based on their contexts and challenges.

INTRODUCTION

Background

On 7th October 2016, in a Maize Flour Fortification Strategy meeting in Dar es Salaam, Tanzania, delegates from 14 African countries resolved to have a coherent maize flour fortification strategy for Africa. The Africa Maize Fortification Strategy is to provide guidance and support to countries in preparing country-specific strategic plans and comprehensive programs for maize flour fortification. The Strategy has been aligned with World Health Organization (WHO); Eastern and Central African Health Secretariat (ECSA), East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA) regulations and guidelines regarding maize fortification.

Africa is home to about 1 billion people. Its land has diverse topography with a large representation of agro-ecological climates and food diversity of over 150 food crops of which 115 are indigenous (Johns 2002) that make Africa distinctive. Africa has the youngest population bulge, which has quadrupled in the last 50 years with a low life expectancy of below 50 years of age in many countries and unacceptable rates of maternal and child mortality. It has the poorest population which directly impacts those who are food insecure and hungry.

The burden of micronutrient malnutrition especially iron and folic acid across Africa is very high, especially among women in child bearing age, pregnant mothers, and children under five years. In Africa, the middle part of the continent from west to east is the most affected with anaemia, with prevalence ranging from 42% to 53% among the pregnant and under five population. In many communities, infectious diseases, malaria and HIV/AIDS have exacerbated this. Despite these enormous challenges, several countries in Africa are making progress towards addressing food and nutrition security.

In Africa, maize consumption constitutes 52-65 percent of the energy intake for much of the population in the region. Maize is consumed in different forms; but maize flour made into porridge is the commonest way of consuming maize. The flour is prepared in similar ways as thick porridge but with different local names such as Oshithim in Namibia, Nshima in Zambia, Umutsima in Rwanda, Okoume in Togo, To in Burkina Faso, Nsima in Malawi, Bota, Sadza or Isthwala in Zimbabwe, Ugali in both Tanzania and Kenya, Pap, Putu or Liphlish in South Africa and Posho in Uganda. In some countries, such as Tanzania, Malawi, Kenya, Zambia, Zimbabwe, and Lesotho close to 90% of the population consumes maize flour products. This makes maize flour a very important, if not the most important, food vehicle to try and reach with micronutrients for the majority of the vulnerable population in the urban and rural areas.



INTRODUCTION

Rationale for Maize Fortification

Food fortification with micronutrients to address micronutrient deficiencies is generally known as an exceptionally cost-effective strategy for eliminating micronutrient malnutrition. It is also easily acceptable, requires none or little change in food habits. Since maize is a staple for many African societies, maize flour can be an appropriate food vehicle for reaching the greatest percentage of the population with micronutrients in the shortest period. It has been recognized that, efficiency of fortification program depends on the safety of the fortification process, stability, and acceptability of the product by the target population.

High and increasing rate of urbanization in Africa means that consumers will be moving from growing their own maize and paying for milling to buying flour. Currently, 40% of Africa's population lives in urban areas. This is expected to increase at 1.1% per annum to 55% (United Nations 2014) in 2050, making urbanization rates in Africa second to Asia.

Strategy Development Process

The process of developing the strategy was consultative. It started with commissioning of a scoping study of maize supply chain, followed by a maize stakeholder's strategy meeting in which the scoping study report was presented and discussed. The country experiences, the scoping study report and the road maps prepared by the country teams participating in the meeting informed the preparation of this strategy. The draft maize strategy was shared with country teams for validation and further comments. The comments of the countries were incorporated into the final strategy document.

The strategy development process was technically and financially supported by Smarter Futures, a partnership for Africa of the Food Fortification Initiative (FFI), the International Federation for Spina Bifida and Hydrocephalus (IF), Helen Keller International (HKI), Akzo-Nobel and the Government of the Netherlands and the Ministry of Health, Community Development, Gender, Elderly and Children of the United Republic of Tanzania.



2. SITUATIONAL ANALYSIS FOR MAIZE FLOUR FORTIFICATION

Status of Maize Fortification in Africa

Currently, 89,745,000MT of maize grain is produced locally and imported into Africa of which 52,627,000MT (60.5%) is for human consumption (see table in annex 1 for details). The maize scoping study commissioned by Smarter Futures reveals that, less than 30% of the human consumed maize is fortified, mostly that milled in large scale roller mills, in South-Africa, Uganda, Kenya, Namibia, Nigeria, Zambia and Zimbabwe. In the medium-scale mills, fortification has been introduced in the region to some degree especially in the ones that use roller mills. Technology for fortification in commercial hammer-mills is being developed and tested in Tanzania under cooperative models. Small scale maize flour industries were provided with equipment and premix under different arrangement to initiate maize flour fortification. However, the success of this (voluntary) program was/is attached to donations (of equipment and premix), and since this support is temporary, industries may stop to fortify, if projects end, thus, undermining all the efforts and resources put in place.

Maize flour fortification in most African countries is still on voluntary (when the food manufacturer freely chooses to fortify flour) basis. A few countries such as South Africa, Uganda, Kenya, Tanzania, Zimbabwe, Burundi, Nigeria, Malawi and Mozambique have mandatory maize flour fortification legislation. Through the voluntary food fortification programs, the countries and partners have put a lot of efforts to start and scale-up maize flour fortification in Africa. However, even where there is mandatory legislation for maize flour fortification, fortification by millers has been lagging due to the lack of or inadequate industry infrastructure, lack of technology for small commercially packaging mills, the absence of premix distribution mechanism and effective Quality Assurance and Quality Control (QAQC) systems.

In most of the countries the critical amount of political support is lacking due to perceived priority of other health and nutrition interventions; lack of awareness of magnitude of problem and benefits of addressing it; lack of facilitating legislation and equal opportunities for all potential fortifying companies.

The structure of the milling industry determines the proportion of maize meal that can be fortifiable. All maize in large scale and medium scale roller mills are fortifiable and the technology to fortify are readily available and a good number of the large mills in Africa are fortifying. Medium and small scale hammer mills that purchase, mill and package maize flour, whether branded or not like large scale mills can fortify using appropriate technologies. Medium to small hammer mill are different from the small and micro toll mills, which are fee-for-service mills without packaging and sell flour. Therefore, the toll mills are not the target of this strategy. The types and sizes of mills by technology are depicted in the table 1 below.

Table 1. Types, sizes and technological option for maize mills

Milling Capacity	Milling technology	Fortification Possibilities
Large scale Roller Mills (>50mt/day)	In most countries, there are a few large roller mills that are already fortifying maize or that are easily equipped to do so. Conventional technologies will continue to be used for large scale industrial milling of maize. The coordination, technical and programming of maize fortification in these mills, are done by national fortification alliance.	Fortifiable
Medium size roller mills (20-49mt/day)	Medium scale roller mills utilize the same technology for fortification with large scale mills, but placement of feeders and ability to do QAQC will need to be addressed.	Fortifiable
Medium size hammer mills (20-30mt/day)	Medium size hammer mills that package and brand their flour, and are licensed by or known to the authorities.	Fortifiable
Small scale hammer mills (5-20mt/day)	Small scale hammer mills that package and brand their flour and are licensed or known to the authorities.	Fortifiable
Small scale hammer mills (10-20mt/day)	Small scale hammer mills that do not package their flour but sell it in bulk. These mills may be licensed or known to the authorities.	Fortifiable
Toll mills (0.3-10mt/day)	Toll mills or fee-for-service mills that process maize brought to the mill by household growers.	Not fortifiable

2. SITUATIONAL ANALYSIS FOR MAIZE FLOUR FORTIFICATION

Low Demand and market for fortified maize flour and products

There is currently low market demand for packed/labelled fortified maize flour across Africa. Most of the people in rural areas consume their own home-grown maize, milled at small hammer mills which have limited capacity to fortify maize flour. In most African countries except South Africa and in major cities, fortified maize flour is not readily available. It is difficult to get fortified maize flour to rural communities-where 80% of population rely on hammer mills.

However, in the long-run with increasing rate of urbanization, more consumers will be purchasing maize flour from the shelves. The urban and peri-urban population largely depends on commercially available maize flour, either directly bought at a mill or in a shop. These products need to all be fortified! In addition to urbanization, the home grown maize grain supply is seasonal. At harvest time maize is plentiful and cheap but as the year proceeds, consumers own stocks become depleted and households begin to buy maize grain and/or maize flour from the market.

Inadequate Facilities and Equipment

At the milling level, importing of the feeders is problematic for small commercially packaging mills. With limited capital base, they find it uneconomical to import appropriate technologies. Even when medium millers have the resources, there is lack of knowledge to select the correct feeders for the mills. Lack of appropriate technology for maize flour fortification at small to medium commercial mills that package flours is proving to be dis-incentive for industries to fortify and for partners to support programmes geared towards enhancing capacity of small mills to fortify.

Most countries reported to have very few quality control labs at the milling facilities. The industries consider it as an additional overhead expense to undertake laboratory analysis of the flour in small mills. The limited number of labs take time to release analytical results of micronutrients / tracers hence complicating certification and maize flour production. In addition, lack of knowledge about fortification and about QAQC and GMP hamper many smaller scale millers.

Poor premix distribution systems

Timely and regular access to affordable and quality-assured premix remains a barrier even for large scale roller mills and yet stable access to premix is an essential component towards sustainable fortification programme. Small and medium-sized mills have limited ability to accurately forecast demand for flour and premix needs.

Small millers struggle with financing an upfront purchase of premix that balances the risk of stock-out with that of premix expiration. For most countries, premix must be imported, and there can be high costs associated with this, such as customs taxes, VAT, and currency exchange fluctuations. This makes it cost-prohibitive and risky to purchase premix in small volumes that such millers require. Some countries like Tanzania and many more others exclude premixes from taxes. VAT is paid for by the consumers and remitted to by backers. This is a strength. Delays in international procurement of premix which can have lead times of three months or more, are impractical for the highly fluctuating demand requirements as dictated by changing consumer acceptance and emergency assistance programs.

SWOT ANALYSIS FOR AFRICA MAIZE FORTIFICATION

Strengths	Weaknesses
<ul style="list-style-type: none"> • Many countries have guidelines, policy standards and mandatory legislations for maize fortification • Most countries have National Fortification Alliances or working groups on food fortification • Availability of public sector's institutional structures for coordination of implementation • Existence of research and knowledge institutions for professionalism and development of new technologies and modalities 	<ul style="list-style-type: none"> • Underdeveloped technologies for maize fortification for small mills • Inadequate technical capacity at industry level to start fortification • Lack of appropriate equipment (micro feeders) for small mills, the feeders that are available are not compatible with the installed mills • Fortification initiatives are largely being driven by external partners which overall is not sustainable. • Poor premix distribution systems • Weak enforcement and regulation systems for fortified foods • Weak public-private sector engagement
Opportunities	Threats
<ul style="list-style-type: none"> • Political will from governments ministries, sectors and agencies to support the strategy • Existence of industries and other private sector bodies such as Chambers of Commerce to champion and foster maize fortification • Availability of regional and international bodies like ECESA, WHO, EAC, COMESA • Presence of active research and academic institutions for development of innovative technologies • Support from the development partners to food fortification 	<ul style="list-style-type: none"> • Premix not locally manufactured and easily accessible • Limited public awareness on the importance of consuming fortified foods • High competition from cheap unfortified foods from informal cross border trade • High costs of premixes not affordable by small mills • High taxes on imported equipment for industrial fortification



3. STRATEGIC DIRECTION FOR AFRICA MAIZE FORTIFICATION

Vision

A micronutrient malnutrition-free Africa

Goals for the strategy

To scale up maize fortification with key micronutrients necessary for adequate human health proper growth and productivity.

The strategic focus

- The flour produced from home-grown maize brought by the consumer to a toll mill or fee-for-service mills that does not package the flour commercially is not fortifiable for the near future. Alternative mechanisms need to be put in place urgently to provide vitamins and minerals for the segments of the rural population that grow their own maize, take it to a toll-mill and do not have access to fortified, packaged commercially processed maize flour. Such strategies include provision of multiple micronutrient powder sachets ("sprinkles").
- In almost all countries, large scale industrial maize mills alone are not covering a large proportion of the population, medium and small scale roller/hammer mills that commercially package their flour should be supported to fortify with vitamins and minerals per the national standards.
- Scale up fortification of commercial packaged maize flour/meal by large, medium and small scale (roller/hammer) mills to reach all consumers through developing innovative approaches to make it possible for commercial packaged SMEs to mill and fortify while creating awareness campaigns.
- Adopt a multi-sectoral coordination approach involving commercial packaged maize flour/meal fortification as led by grain millers' associations, large, medium and small roller/hammer millers for ownership/sustainability within their respective governments in ensuring that maize flour/meal fortification program succeeds in their countries.
- Countries that are in the voluntary stage should endeavour to enact enabling legislation that will regulate and enforce maize meal/flour fortification as per their national standards.
- Appropriate technologies that are customized, efficient, affordable, and sustainable for maize flour/meal fortification be developed and provided by suppliers to commercial packaged maize millers.
- Continued lobbying/advocacy for maize flour/meal fortification be undertaken and persuaded vigorously at political and economic institutions such as civil Society's, SADC, AUC, COMESA, UEMOA, EAC, ECSA-HC, ECOWAS, WHO, to scale-up maize flour/meal fortification.
- Governments, private sectors, academic institutions and developmental partners should as resources permitting, continue to harness and nurture the maize flour/meal fortification models and program across Africa.

STRATEGIC OBJECTIVES AND INTERVENTIONS

Strategic objective 1:

Put in place urgently strategies to provide vitamins and minerals for the segments of the rural population that grow their own maize (e.g in Namibia it will be applicable to mahangu), take it to a toll-mill and do not have access to fortified, packaged commercially processed maize flour.

Fortification of maize flour at small fee-for-service village mills has been tried over the years by many NGO and other projects. The problems of providing premix, ensuring quality and ensuring compliance have led to most of these projects failing after the original project came to an end. It is however essential that the rural population that grow their own maize, take it to a toll-mill and do not have access to fortified, packaged commercially processed maize flour be provided with essential vitamins and minerals. This should not await the start of a fortification programme but should be undertaken immediately as a health sector measure.

Strategic Interventions:

- Providing supplements;
- Providing of multiple micronutrient powder sachets ("sprinkles");
- Use of other suitable measures to provide essential vitamins and minerals;
- Undertaking dietary diversification through the provision of other nutritious crops such as vitamin A rich sweet potato, and legumes.



STRATEGIC OBJECTIVES AND INTERVENTIONS

Strategic objective 2:

To provide conducive legal, business and political environment to scale up maize flour fortification in large/medium roller mills in Africa.

The objective will ensure that all large roller mills fortify flour in the immediate term and; all medium sized roller mills fortify their flour in the short term. It will be achieved through three important elements: regulation, advocacy and coordination:

(a) Adequate application of legislation and regulations, including resources for effective enforcement; facilitative rather than punitive regulations, i.e. guidelines that are so restrictive as to impede the provision of high-quality fortified foods or hinder communication on fortification between relevant parties.

(b) Increased advocacy with industries to comply with the legislations and regulation.

(c) A multi-sectoral approach in establishing a programme, including key governmental organizations, the scientific community, consumers, marketing specialists and other relevant interested parties early in the process.

(d) At regional level, the regional bodies such as EAC, ECOSA-HC, ECOWAS, EUMOA, SADC will need to be technically and financially able to address challenges of policy legislation and standard development to support countries.

Strategic Interventions:

- Supporting continuously the regional political bodies to flag off the strategy while other partners can come to support the countries;
- Working through and support these political bodies to advocate for policy change in support of the FF in the countries;
- Developing or reviewing national legislation and standards for mandatory maize flour fortification in line with regional/international requirements;
- Developing and disseminating specifications for premixes;
- Strengthening of functional and technical capacity of National Fortification Alliances through constant training and research;
- Providing technical and financial support to small scale industries and programme coordination from government, private sector and development partners;
- Encouraging countries to pass and enforce mandatory legislation and integrating monitoring activities/human resource in the national budget.

STRATEGIC OBJECTIVES AND INTERVENTIONS

Strategic objective 3:

Ensure flour fortification at all packaging/branded commercial hammer mills, starting with the largest so that in the medium term they all fortify.

While technology for roller mills is well-developed and generally available, fortification at the hammer mills is less common.

Hammer mills use a batch process and mill maize that has already been de-hulled. Basically, a scoop of premix added to the standard bucket of maize grains would be a simple method to fortify the maize as the hammer-milling process would ensure thorough mixing. This method is however not as reliable as some of the newer technologies that have been developed where quality can be assured through an interlock between feeder and maize flour production rates.

Strategic Interventions:

- Ensuring that mills operate under GMP with defined standard operating procedures;
- Organising meetings for the mill owners about fortification and its importance and create awareness among stakeholders;
- Adopting good governance principles of involving stakeholders in decision making;
- Developing guidelines for SME's on fortification, GMP's, QAQC;
- Developing of affordable and effective feeder technology;
- Developing innovative models for premix procurement, such as revolving funds;
- Involving stakeholders in the development of suitable alternative technology;
- Establishing of associations for sourcing premix, feeders and other equipment;
- Use the associations for training of its members on e.g. GMP and QAQC.



STRATEGIC OBJECTIVES AND INTERVENTIONS

Strategic objective 4:

To identify and map the small-scale packaging hammer mills so that in the longer term they too can be helped to fortify.

There are many smaller hammer mills that operate commercially and package their product but may not be registered and/or licensed and may not label their product, thus making easy traceability a problem.

Collective action will be needed to support maize flour fortification by small scale hammer mills. Use of SMEs and millers' association to foster unions and cooperatives to support implementation of maize flour at medium and small scale.

Strategic Interventions:

- Through existing resources such as health inspectors, agricultural extension workers etc. identifying and mapping all smaller scale commercially operating packaging hammer mills;
- Listing which maize mills are packaging and which are just toll mills/fee for service mills;
- Establishing a registry of these mills and a country specific mechanism for reaching out to the mill owners;
- Organising meetings for the mill owners about fortification and its importance and create awareness among stakeholders;
- Involving stakeholders in decision making;
- Encouraging research institutes to develop cost effective and appropriate technology for fortification at small hammer mills;
- Developing guidelines for SME's on fortification, GMP's, QAQC;
- Establishing associations for sourcing premix, feeders and other equipment;
- Using of SMEs and millers' association to foster unions and cooperatives to support implementation of maize flour at medium and small scale;
- Linking purchase of premix could be linked in with these already existing purchasing models;
- Using the associations for training of its members on e.g. GMP and QAQC.

STRATEGIC OBJECTIVES AND INTERVENTIONS

Strategic objective 5:

To increase demand and consumption of fortified maize flour by the targeted population.

The success and sustainability of maize flour fortification in Africa will depend on a number of factors; one of which is intensive and appropriate investment in the information, education and communication of all stakeholder as well as the consumer about the health problems of micronutrient malnutrition, the benefits of consuming fortified foods and the fortification approach to raise consumer awareness and ensure consumer acceptability, and to ensure that there are no cultural or other objections against fortified foods; minimal cost increase to the consumer, to the extent possible. This also requires relevant nutritional information available through adequate labelling to help ensure consumer involvement, commitment and understanding of the advantages of fortifying foods.

Once fortification is mandatory, public information becomes less important but good information to consumers is essential so that they can exercise their demand and ensure that non-compliant industries are tagged.

Strategic Interventions:

- Intensifying social marketing of fortified maize flour across the major maize consuming sub-national regions in each country through:
 - o Media seminars to talk about the health benefits of consuming fortified foods and fortification regulations;
 - o Preparing and disseminating appropriate Fortification IEC materials and, conducting advocacy meetings, promotional activities and campaigns.
- Each country will develop and implement specific Communication and Advocacy Strategies based on their individual IEC needs and contexts;
- Supporting institutions like Prisons, Education, health, NGOs etc. to consume and/or fortify maize flour to improve their health on the one hand and make them used to fortified products on the other.



STRATEGIC OBJECTIVES AND INTERVENTIONS

Strategic objective 6:

To increase proportion of fortified maize produced and distributed across the countries.

This objective addresses technical constraints associated with installation and maintenance of fortification machinery in roller mills and developing innovative technologies and programmes for fortification in hammer mills; and ensuring a stable supply of premix under the bad distribution and storage conditions often found in Africa.

Since actual fortification is an industrial undertaking, support of industry and early involvement of local industry and the private sector is very essential for voluntary and self-regulated fortification initiatives and remains important also where the fortification is mandatory. Adequate technical expertise, proper testing under a range of real field conditions, and adequate training in fortification technology, quality assurance and control will be paramount in increasing the production and marketing of fortified maize flour in Africa.

Strategic Interventions:

- Building capacity of the human resources at the industry and marketing levels and of public health and food-safety personnel;
- Assessing equipment needs of the small and medium-scale milling industries to fortify and capacity of industries to undertake internal QA/QC;
- Advocating and supporting innovations to develop cost-effective and appropriate technologies/equipment for hammer mills to fortify adequately and sustainably;
- Supporting formation and capacity development of associations/cooperatives for hammer millers for cost-effective premix distribution systems, sourcing of grain and marketing of fortified maize flour;
- Developing national or localized procurement, storage and distribution capacity to achieve sustainable and timely access to premix by large/medium/small millers.



STRATEGIC OBJECTIVES AND INTERVENTIONS

Strategic objective 7:

To increase compliance to standards of maize flour and premix through training on GMP, QA/QC and development of guidelines for SME's.

Fortification will only achieve its aim, i.e. to improve the health of the population if the amount of fortificants added is appropriate for that population. The standards and regulations for fortification reflect this and therefore need to be adhered to.

Strategic Interventions:

- Providing innovative financial support to organizations of small millers for initial stages of fortification, e.g. through provision of an initial batch of premix;
- Ensuring that all imported premix meets national (and regional where applicable) regulations and standards and requirements including premix lot number traceability;
- Undertaking routine and periodic training of both roller and hammer millers on QA/QC practices including premix addition and usage reconciliation, where possible through their associations;
- Developing and disseminating country QA and QC protocols for industries and regulators;
- Training of the food inspectors in inspection of fortified foods;
- Training of small & medium scale millers on SOP's, GMP and food safety.



4. TIMEFRAME FOR IMPLEMENTING THE MAIZE FORTIFICATION STRATEGY FOR AFRICA

The implementation of the strategy runs from 2017 to 2026. In developing the Road maps that are the basis for implementation framework of this strategy, country teams stressed the following as summarised in the table 2.

Time Frame	Expected outcomes
Short term (2017-2018)	<ul style="list-style-type: none"> Large and medium rollers mills should start fortification as soon as possible if they don't yet do so. Countries to put in place urgently strategies to provide essential vitamins and minerals for the segments of the rural population that grow their own maize, take it to a toll-mill and do not have access to fortified, packaged commercially processed maize flour. The maize flour consumed by the ever growing urban and peri-urban populations, which comes for large and smaller commercial mills should be fortified as soon as feasible.
Medium term (2019-2022)	<ul style="list-style-type: none"> The small/medium hammer mill enterprises that are commercially packaging and branding in start fortification.
Long term (2022-2026)	<ul style="list-style-type: none"> Non-packaging hammer millers being given a longer period of grace in which also their numbers can be mapped and modalities developed to bring them together in associations or cooperatives.



5. MONITORING, SURVEILLANCE AND EVALUATION

The success and sustainability of fortification programmes depends on several essential factors one of which is effective monitoring, surveillance and evaluation. It has been shown that demonstrating the public health benefits of fortification programmes is critical in long-term sustainability and in gaining the commitment of public and private sectors as well as consumer demand for the fortified food (Mora et al. 2000). Monitoring and evaluation will also address concerns of safety of food fortification. The trending practice in fortification programming is towards a public-private sector collaboration, with facilitative legislation and quality assurance by the industries.

The monitoring framework is based on the monitoring and devaluation system for food fortification programmes as proposed in the WHO/FAO Guidelines on food fortification with micronutrients. It includes measures taken by the industries and public inspectors to assure that the food is fortified at adequate levels and is properly labelled when it reaches the consumer. The strategy will build onto the FFI/GAIN/KU On-line training modules for QAQC and the FORTIMAS framework as published by Smarter Futures and be designed to put in place specific mechanisms for prompt corrective actions to be taken by relevant parties when problems are identified.

SN	Result	Indicator
1	Increased awareness on fortified maize flour	% of households, aware of the importance of consuming fortified maize flour
2	Increased consumption of fortified maize flour and products	% of population consuming fortified maize flour and other products
3	Increased production and supply of fortified maize flour	% of fortified maize flour produced and imported
4	Reduced stock out of premix and fortifi-cants	# of mills without stock out of premix and fortificants
5	Industries complying with national maize fortification standards	% of industries fortifying maize flour/products or brands per national standard
6	Industries applying good manufacturing practices (GMP) as per set standards	% of industries applying GMP
7	Industries undertaking independent analysis	% of industries undertaking independent quantitative analysis of the micro nutri-ents
8		% of industries undertaking independent qualitative analysis of the micro nutri-ents
9		# of industries keeping records
10	All imported fortified products conform to national standards	% of samples of imported fortified products which conform to national standards
11	Collective bargaining power for SME increased	# of food fortification related SME associations formed
12	Industries keeping stock records for reconcilia-tion of premix used and flour produced	% of industries keeping reconciliation record for premix and flour stocks
13	Food control inspections	# of mills inspected and % of mills in compliance with fortification practices

The evaluation for maize flour fortification will be integrated into the overall food fortification monitoring systems which include among others, identifying patterns of consumer behaviour in terms of the purchase and consumption of the fortified maize; determining intake of the nutrient of interest and the contribution of the fortified food to this intake; compliance and quality control and assurance by the industry and surveillance of impact on the micronutrient status of the target population.

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Notes:

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