Voice For Change Partnership (V4CP)

SNV

DUHAMIC-ADRI

SUMMARY OF SMALL AND MEDIUM ENTREPRISES IN FOOD FORTIFICATION

AUGUST 2020

Table of Contents

ACCRONYMS AND ABBREVIATIONS

AIF:	Africa Improved Food
BDE:	Business development and employment
CSO:	Civil Society Organization
GDP:	Gross domestic products
FDA:	Food and Drug Authority
MINICOM:	Ministry of Trade and Industry
NISR:	National Institute of Statistics in Rwanda
PSTA:	Strategic plan for agriculture transformation
RDB:	Rwanda Development Board
RSB:	Rwanda Standards Board
RRA:	Rwanda Revenue Authority
SNV:	Stichting Nederlandse Vrijwilligers (Netherlands Development Organization)
SME:	Small and medium enterprise
V4CP:	Voice for Change Partnership

1. Introduction

DUHAMIC-ADRI is a non-profit Organization governed by Rwandan law, established in 1979 with the objective of helping farmers to organize themselves to fight against the constraints of the marginalization of rural areas.

Voice for Change Partnership (V4CP) is an evidence based advocacy multi-country and multi-sector program funded by the Dutch Ministry of Foreign Affairs/ Directorate-General for International Cooperation (DGIS), implemented in six countries: Kenya, Rwanda, Burkina Faso, Ghana, Honduras and Indonesia with a duration of five years 2016-2020. The program in Rwanda is implemented under the leadership of SNV in conjunction with International, Food Policy Research Institute (IFPRI and in partnership with DUHAMIC-ADRI, SUN Alliance, ADECOR, Imbaraga, RDO and Caritas. V4CP chosen to focus on 4 focus areas including Food and Nutrition Security, WASH, Renewable energy, Resilience because of the important focus areas towards the future (SDGs). This is a five years' project aiming at advocating for food security and nutrition for all especially poor women. For this project, DUHAMIC-ADRI is more focusing its intervention on addressing increased production and consumption of diversified nutritious foods and food fortification. The project is implemented where it has other operating projects with focus on fortification both for availability and for accessibility of fortified foods. With this Summary report, DUHAMIC-ADRI would like to call on all Large, small and medium enterprises (SMEs) to invest in Food fortification to curb malnutrition in Rwanda.

Nutrition is the intake of food, considered in relation to the body's dietary needs. It is part of "food utilization" at the individual level. Human nutrition deals with the provision of essential nutrients in food that are necessary to support human life and health. Food fortification, refers to the practice of deliberately increasing the content of essential micronutrients such as vitamins and minerals in a food to improve its nutritional quality by providing public health benefit with minimal risk to health (WHO/FAO 2006). The public health benefits of fortification include but are not limited to prevention or minimization of the risk of occurrence of micronutrient deficiency in a population or specific population groups and contribution to the correction of a demonstrated micronutrient deficiency in a population. Vitamins and minerals such as iron, vitamin A, folic acid, and iodine are added to staple foods to improve their nutritional content. Typical foods fortified include cereals and cereal based products (mainly wheat and maize flours); milk and milk products; fats and oils; infant formulas and various beverages.

Good nutrition is not just about having enough food, but rather having the right food, at the right times. Food fortification is one important step in making sure populations gain a balanced diet. Fortified foods help to fill in the nutritional gaps in our diet. They can deliver vitamins and minerals to large portions of the population without requiring large changes in our behaviour or diet. The legal framework is a crucial factor for the success of food fortification programs, as it shapes to a large extent the implementation of food fortification. It is instrumental to ensure the quality, safety, availability, cost-effectiveness, and sustainability of food fortification.

The foods most commonly fortified are salt, wheat, corn, rice, oil, bouillon cubes, soya sauce and other condiments. While efforts had been made to stimulate fortified food production by the Government of Rwanda, the legislation in place was only voluntary and did not oblige the food sector to fortify staple foods. As a result, when the V4CP began its food and nutrition program in the country in 2016, fortified food production was limited. Private investment in the sector remained low, and the service systems required to distribute fortified food to the population were inadequate. Food fortification is still low in Rwanda. On one hand, decision makers are dealing with elimination of malnutrition across the Districts with high rates of malnutrition such as Kicukiro, Muhanga, Nyamagabe, Nyaruguru, Nyabihu on the other hand, food processing companies are investing for having profit carefree on the purchasing power of vulnerable populations who are exposed to

malnutrition especially women and children under five years old, pregnant mothers, lactating mothers, elders, disabled people and why not youth. In order to raise awareness on food fortification both at demand and supply sides and report the progress on SMEs involved in Food Fortification, DUHAMIC-ADRI developed this simplified, informative report and advocacy tool to update stakeholders on Small, Medium Enterprises (SMEs) doing food fortification and those waiting which will guide the consumers on their purchase choices, private companies and the Government of Rwanda to invest more in fortification and increase fortified products to curb malnutrition at large scale. Those actions are the bridge of decision makers to enhance their role of awareness on consumption of fortified foods and invest, which contribute to eliminate malnutrition.

2. The Rationale of SMEs' involved in Food Fortification

Since food fortification benefits are wide, food fortification can be a very cost-effective public health intervention. The benefits include;

i) Elimination of malnutrition and nutritional deficiencies
ii) Provide extra nutrition at affordable prices
iii) Requires no changes in dietary patterns and Requires no individual decision for compliance
iv) The inherent characteristics of the food remain the same even after fortification
v) Wide scale production of fortified foods can help improve the overall nutritional problem of a country, by catering to both, the poor and the rich
vi) Fortification of some foods may also be seen as providing a marketing advantage especially where the consumers are aware of the 'benefits' of the nutrient being added
vii) The addition of a nutrient may also offer some other benefit for example, vitamin C is an antioxidant and can reduce the rate of spoilage in some products, or a direct health benefit for a subgroup of the population for example flour fortification with folic acid to prevent neural-tube defects in babies. Research showed that each year of flour fortification is associated with a **2.4%** decrease in anaemia. https://blog.oup.com/2015/11/flour-fortification-programs). With V4CP, DUHAMIC-ADRI is aiming at advocating for food security and nutrition for all, especially to poor women with focus on increased production and consumption of diversified nutritious foods. As Food fortification is a cost-effective, powerful, and sustainable strategy to combat micronutrient deficiency, with the potential to reach large sections of the population with minimal cost and effort specifically, with this assignment of mapping the SMEs involved in Food Fortification, DUHAMIC-ADRI is targeting 7 key LSMEs as following:

Names of the companies visited	***Location***	***Types of foods fortified***	***Type of fortificants added***
African Improved food	Gasabo district	Cereals/Pulse (Maize, Soya)	Iron, vitamin A, B12, zinc and folic acid
Sosoma Industries Ltd	Kicukiro district	Cereals (Sorghum, Maize, Wheat, Soya)	Iron, vitamin A, B12, zinc and folic acid
Minimex Ltd	Gasabo district	Maize Flour	Iron, vitamin A, B12, zinc and folic acid
Ihangane Project	Gakenke district	Cereals/Purse (Maize, Soya)	Iron, vitamin A, B12, zinc and folic acid
Muhanga Food Processing Industries Ltd	Muhanga district	Cereals (Maize, Soya)	Iron, vitamin A, B12, zinc and folic acid
Mount Meru Soyco Ltd	Kayonza district	Cooking oil	Vitamins A and D
Oasis Contractors General Supply and Services Ltd	Gasabo district	Salt	Iodine

3. Rwanda Food Fortification Law, Types, Methods and Examples of fortification:

One of the most efficient ways to tackle widespread malnutrition is to add micronutrients, such as iron, vitamin A, folic acid and iodine to staple, processed foods in order to improve their nutritional content. Currently, the Rwanda Food and Drugs Authority (Rwanda FDA) which is also mandated to regulate pharmaceutical products, vaccines, human and veterinary processed foods, among other things regulate food fortification and related matters in Rwanda. The Rwanda FDA is established by Law nº 003/2018 of 09/02/2018, which determines the Agency's mission, organization and functioning. In October 2019, the "Regulations on food fortification in Rwanda" was signed, making fortification mandatory for ***Maize Flour, Wheat flour, Edible oil, Sugar and salt***. This took concerted effort by a wide range of civil society organizations, private sector and government institutions. The implementation of this law will improve the availability of fortified products on the market. The mal nourished people and the population in general will have easy access to nutritious food, which will create a healthier society. Three major types of fortification have been recognized including;

i) ***Mass fortification*** which consists of the addition of micronutrients to edible products that are commonly consumed by the general public, such as cereals, oils and vegetable fats, milk, sugar, and condiments;

ii) ii) ***Targeted fortification*** is the practice of adding sufficient amounts of micronutrients to provide large proportions of the daily needs through foods designed for specific population subgroups, such as complementary foods for infants and foods used under emergency situations

iii) iii) ***Market-driven fortification*** refers to voluntary practices of the food industry to increase the nutrient content and added value of a highly processed product with the purpose of attracting consumers and increasing sales. Foods commonly imported or manufactured in Rwanda i.e. rice, maize flour, sugar, potatoes, cooking oil and salt, lack adequate nutrients to support the growth and development of the human body. Food Fortification is a Good Practice to Improve Health and Prevent Nutritional Deficiencies.

Main methods of food fortification are named so as to indicate the procedure that is used in order to fortify a certain food type and these are:

i) ***Bio-fortification or Conventional***, selective breeding of crops and modern genetic modification to increase their nutritional value
ii) ii) ***Commercial and industrial fortification*** flour, rice, oils common cooking foods
iii) iii) ***Home fortification*** for example vitamin D drops in foods
iv) iv) ***Synthetic biology*** for example the addition of probiotic bacteria to foods.

Examples of Food fortification, globally, many beverages and food products have been fortified however, in order for a product to be fortified; it must first be proven that the addition of a particular mineral or vitamin is beneficial to health and safe. Examples of foods and beverages that have been fortified and shown to have positive health effects include but not limited to cereals which have high carbohydrates content and when fortified with vitamin B, significantly decrease the homocysteine concentrations in consumers, this can lower the risk of vascular disease and dementia. In addition to that, bread is composed of whole grains or white flour and is often fortified with folic acid, a B vitamin also known as folate and in many industrialized countries, the addition of folic acid to flour has prevented a significant number of neural tube defects in infants. Soy milk is derived from soy beans and it is used as an alternative to regular milk by people who have allergies or are strict vegetarians. It is high in protein and is often fortified with calcium, which it does not naturally contain. Milk is high in calcium, protein, fat and is often fortified with vitamins A and D for bone health. Salt is high in sodium and is used in many different foods to add flavour, it is fortified with iodine and this benefits thyroid function. Finally, sterols and stanols which are naturally-occurring substances found in various plant and animal cells can be used as fortificants. Foods that are fortified with those substances include yogurt, butter, chocolate, cheese and orange juice.

On the visited local markets, the fortified foods, bio fortified and commercial are expensive compared to existing commodities for example. 1 kg of High Iron Beans cost 700Rwf compared to none fortified beans which costs 500 frw per Kg

Bio-fortified foods

Industrial fortification of flours

4. Food processing companies/SMEs involved in food fortification

The Small and Medium Enterprises (SMEs) play an important role in the Rwandan Economy in general according to the MINICOM (2010). Small and Medium Enterprises (SMEs) in Organization for Economic Cooperation and Development (OECD) countries account for over 95% of all firms, between 60% and 70% of employments and 55% of GDP and create the majority of new jobs (Appol, K. (2014). Rwanda Private Sector Federation (2008) study estimated that there are over 72,000 SMEs operating in Rwanda, while only 25,000 of them are formally registered (34%) (Small and Medium Enterprises and Job creation in Rwanda 2016). Small and Medium Enterprises (SMEs) and micro enterprises in Organization for Economic Cooperation and Development (OECD) countries account for over 95% of all firms, 60-70% of employment and 55% of GDP and create the majority of new jobs, indicating the impact SMEs have on employment. In contrast, currently over 80% of Rwandans are engaged in agricultural production. The SME sector, including formal and informal businesses, comprises 98% of the businesses in Rwanda and 41% of all private sector employment — though the formal sector has much growth potential with only 300,000 currently employed. Most micro and small enterprises employ up to four people on average, showing that growth in the sector would create significant private sector non-agricultural employment opportunities (SME policy 2010).

out 585 companies certified by Rwanda standards Board, only 25 of them are involved in food fortification, complying with the standards with focus on nutrient content including Cereals (Maize, Wheat), Milk products, Sugar, Oil and Salt. These foods share the same following characteristics;

i) They are consumed by a large proportion of the population, including those population groups at high risk of deficiency
ii) They are consumed on a regular basis, in adequate and relatively consistent amounts
iii) They can be centrally processed (central processing is preferable for a number of reasons, but primarily because the fewer the number of locations where fortificants are added, the easier it is to implement quality control measures; monitoring and enforcement procedures are also likely to be more effective
iv) Allow a nutrient premix to be added relatively easily using low-cost technology, and in such a way so as to ensure an even distribution within batches of the product and

v) These food products are ready for human consumption immediately after production and purchase. Foods that are purchased and used within a short period of time of processing tend to have better vitamin retention, and fewer sensorial changes due to the need for only a small overage.

The choice of fortificant compound is often chosen based on a number of factors of; cost, bioavailability from the diet, and the acceptance of any sensory changes. When selecting the most appropriate chemical form of a given micronutrient, the main considerations and concerns are considered

i) Sensory problems: Fortificants must not cause unacceptable sensory problems (e.g. colour, flavour, odour or texture) at the level of intended fortification, or segregate out from the food matrix, and they must be stable within given limits. If additional packaging is needed to improve stability of the added fortificant, it is helpful if this does not add significantly to the cost of the product and make it unaffordable to the consumer

ii) Interactions, the likelihood or potential for interactions between the added micronutrient and the food vehicle, and with other nutrients (either added or naturally present), in particular any interactions that might interfere with the metabolic utilization of the fortificant, needs to be assessed and checked prior to the implementation of a fortification programme

iii) Cost: The cost of fortification must not affect the affordability of the food nor its competitivity with the unfortified alternative

iv) Bioavailability: The fortificant must be sufficiently well absorbed from the food vehicle and be able to improve the micronutrient status of the target population

v) Safety is also an important consideration, the level of consumption that is required for fortification to be effective must be compatible with a healthy diet.

According to Association of Maize Millers in Rwanda (AMMIRWA), Rwanda records: i) 20 major maize millers (i.e. >200MT/week with only one milling >100MT/24hours; ii) 30 medium maize millers (i.e. 50-200MT/week); iii) >250 small maize millers (< 50MT/week). Most of these maize milling companies are hammer mills[1]. Minimex Ltd; the leading maize miller in Rwanda with a capacity of 144MT/day. 24 companies are waiting for fortification.

STANDARDS OF FOOD FORTIFICATION ACCORDING TO RWANDA STANDARDS BOARD

RS EAS 767 (Rwanda Standards/East Africa Standards):2012 Fortified wheat flour—Specification: According to this standard, factories should aim at fortifying the products at the recommended factory level to ensure the product conforms to the regulatory levels throughout the distribution chain. For hygiene, it is recommended that the products covered by the provisions of this standard be produced, prepared and handled in accordance with EAS 39: 2000, Hygiene in the food and drink manufacturing industry – Code of practice and the product shall be free from pathogenic micro-organisms. When tested by appropriate methods, the standard RS EAS 767:2012 specifies that the product shall conform to the following limits of microorganisms: Yeast and Moulds CFU per gram shall be 104, and.Escherichia coli shall be absent.

a) ***RS EAS 35: 2013 Fortified food grade salt—Specification:*** According to this standard, a fortified food grade salt is the salt to which micronutrients have been added. Fortified food grade salt shall be fortified with potassium iodate to conform to the recommended factory levels of iodine of 40±5 mg/kg. All salts entering in country are fortified.

[1] Food Fortification Regulation in Rwanda, Presentation from Moses NDAYISENGA, October 2016

b) ***RS EAS 770:2013 Fortified sugar—Specification:*** This standard specifies that the fortified sugar shall conform to the requirements and the factory levels of vitamin A of 10±5 mg/kg. This is an opportunity area to interest the SMEs as up today there is no fortified sugar in Rwanda and it is highly consumed.

c) ***RS EAS 769:2012 Fortified edible oils and fats —Specification:*** Edible fats and oils are food stuffs which are composed of glycerides of fatty acids of vegetable, animal or marine origin. They may contain small amounts of other lipids such as phosphatides, unsaponifiable constituents and free fatty acids naturally present in the fat or oil. The edible fats and oils shall be fortified with vitamin A (Retinyl palmitate) ad shall conform to the recommended factory levels of 35±5 mg/kg. Most of the time, fortification is considered same as enrichment though they slightly differ. Both terms mean that nutrients have been added to make the food more nutritious. Fortification implies that vitamins or minerals that were not originally in a certain type of food have been added to it. An example is adding vitamin D to milk. On the other hand, enrichment means that nutrients that were lost during food processing have been added back. An example is adding back certain vitamins lost in processing wheat to make white flour.

Rwanda Standards Board encourages investments in the area of food fortification to curb malnutrition and other nutrient deficiency-bone diseases. While some fortified food products have been awarded RSB Standardization Mark, consumers are encouraged to refer to them as solution guaranteeing healthy lives and sustainable development.

SME is any enterprise with less than 100 employees, an annual turnover below 50 million RWF and a net investment capital below 75million RWF[2]. The majority of Rwanda's economy is made up of small and medium-sized enterprises (SMEs) and cooperatives. These businesses and associations are important vehicles in poverty reduction and skills development, but their challenges are uniquely formed by their small operating scale. MINICOM therefore pays special attention to them, through dedicated SME forums and through the Rwandan Cooperatives Agency (RCA). MINICOM's work under the National Employment Programme (NEP) is also focused on SMEs and cooperatives. Scaling industry into small, medium or large enterprises is generally done based responses from the company about capacity of production and staffing, also on scaling criteria of industry in Rwanda as indicated in "SME's products clusters in Rwanda" (2011). Small Scale and Medium Enterprises is defined as any enterprise with less than 100 employees, an annual turnover below 50millions RWF and a net investment capital below75 millions Frw. Establishment scale by number of employees is as follows (Micro enterprise: 1- 3 employees; Small enterprise: 4-30 employees; Medium enterprise: 31-100 employees; Large enterprise: 101 and more employees).

[2] http://www.minicom.gov.rw/fileadmin/minicom_publications/Reports/minicom_smes_product_clusters_booklet.pdf

The table below shows Micro, Small, Medium and large enterprises involved in food production

Size of the Company	*Net Capital Invested (000,000s)*	*Annual Turnover (000,000s)*	*Number of Employees*
Micro Enterprises	***<0.5***	***<0.3***	***1-3***
Small Enterprises	***05-15***	***0.3-12***	***4-30***
Medium Enterprises	***15-75***	***12-50***	***31-100***
Large Enterprises	***>75***	***>50***	***>100***

In order to sustain the food fortification in Rwanda, the multi-stakeholder approach taken by the CSOs, involving a wide range of both public institutions and private companies in the advocacy process - and in drafting the new law - will lead to increased investment in fortification and to improved outcomes in the longer term. The breadth of involvement continues to grow, as membership of the National Fortification Alliance, chaired by ADECOR, expands. Crucially, a significant portion of its membership comes from the private sector. The new law is shifting the norms for this sector, and its involvement in, and ownership of, the issue will help sustain the availability of fortified products into the future. Food processing companies, such as African Improved Food (AIF), MINIMEX, SOSOMA and others, are significantly improving the coordination of food fortification initiatives and have devised strategies to create better access to, and use of, fortified products in Rwanda. Food fortification companies have started to increase their investment, and large producers are now both able and willing to increase supply.

5. Cost of Fortification

One of the most efficient ways to tackle widespread malnutrition is to add micronutrients, such as iron, vitamin A, folic acid and iodine to staple, processed foods in order to improve their nutritional content. Food fortification is considered to be one of the most cost-effective ways of addressing widespread deficiencies. Currently, fortified foods on the market have the same value like non-fortified foods, and regrettably consumers reach out more for those that are not fortified. It is indeed a problem; a processor cannot keep producing to compete with all other foods that are non-fortified. The enrichment is synonymous with fortification and refers to the addition of micronutrients to a food irrespective of whether the nutrients were originally in the food before processing or not. The Cost limit refers to the maximum acceptable increment in price of a food due to fortification.

The cost-effectiveness of an intervention is expressed in terms of the cost of achieving a specified outcome. Analyses of cost-effectiveness are particularly useful for comparing different interventions that share the same outcome. In assessments of health interventions, the two most widely used effectiveness measures are “cost per death averted” and the “cost per disability adjusted life-year saved” (cost per DALY saved). Both measures can be applied to micronutrient interventions. Although the latter measure combines mortality and morbidity outcomes into a single indicator, its calculation is generally more demanding in terms of data needs and assumptions.

A cost–benefit analysis compares the monetary cost of an intervention with the monetary value of a specified outcome (i.e. the benefit). Because cost–benefit analyses are able to compare interventions whose potential benefits or outcomes extend beyond health, they can be used to evaluate the relative merits of health interventions and other kinds of government spending. Cost–benefit analyses are thus especially helpful for advocating for increased resources for nutrition and health.

Cost-effectiveness and cost-benefit analyses have shown that

(i) Both iodine and iron fortification have the potential to achieve high cost–benefit ratios, given the prevailing levels of micronutrient deficiency and the economic situation of many low-income countries.

(ii) Food fortification with vitamin A is highly cost-effective in reducing mortality in children, as is supplementation with iron in pregnant women.

(iii) Fortification becomes increasingly cost-effective the higher the proportion of the population in need of the intervention.
According to MINEMIX and SOSOMA interviews, the cost of fortification is estimated to 10RWF/Kg for Maize and 45RWF/Kg for other cereals. The key challenges in the production systems are the unreliable supply of raw materials; packaging materials, unfair market competition and limited working capital which significantly affect their production performance. They should be incentives, such as tax exemptions on industries that fortify food so that they make the foods affordable to Rwandans

6. Role of Civil Society Organizations in increasing investment in Food Fortification

Rwanda has seen a variety of initiatives to support Rwandan SMEs from the government, Development Partners (DPs), financial and non-governmental organization (NGO) sectors. One of the barriers to progress in Food Fortification was lack of evidence of the impacts of fortifying food. There was insufficient data on the status of nutrition and food fortification across the population, and poor monitoring data for fortification programmes, as well inadequate risk management. To bridge the gap, ADECOR and DUHAMIC-ADRI worked with IFPRI and generated evidence products such as a report entitled the 'Status of Food Fortification in Rwanda'. Using this as a basis, V4CP developed advocacy interventions and engagement strategies to raise awareness of the benefits of fortified foods. It reached out to communities in order to increase market demand and held learning and discussion events to inspire a wide range of multi-sector stakeholders, from government entities to private sector and international non-governmental organisations, to speak as one voice. Civil society organisations are advocating for increased access to bio fortified crops and food as one of the solutions to combat malnutrition and end stunted growth among children. Civil Society Organizations (CSOs) suggest GOR to increase the budget allocated to food security and nutrition to effectively reduce the burden of stunting among the children and women of reproductive age.

CSOs involvement has been clear in the formulation of inclusive policies and frameworks, improved budget allocation in the food fortification, increasing the accessibility and use of fortified crops or products in Rwanda and creating public visibility on sector issues.

With regards to the challenges faced by food industries, the majority of food companies are not located in industrial zones, and it has been claimed that these zones were not well structured to accommodate different food industries depending on their size, nature and capacity. In addition, in the production systems, unreliable supply of raw materials; packaging materials, unfair market competition and limited working capital are key issues that significantly affect their production performance. CSOs have a key role in:

(i) Creating an enabling environment – in this case, one that makes adequately fortified foods widely available and provides the means for individuals to acquire them;
(ii) Helping individuals adopt healthful behaviours – in this case, behaviours that enhance the contribution of fortified foods to their micronutrient status.
(iii) Advocate for SMEs to acquire the raw materials, packaging and fair market. This will low the cost of fortified foods at the market and affordable for the poor.
(iv) Advocate for Media not to conduct the simply publicities but also play the role of public information.

7. Conclusion

To conclude Small and Medium Enterprises (SMEs) and micro enterprises in Organization for Economic Cooperation and Development (OECD) countries account for over 95% of all firms, 60-70% of employment and 55% of GDP and create the majority of new jobs, indicating the impact SMEs have on employment. In contrast, currently over 80% of Rwandans are engaged in agricultural production. The SME sector, including formal and informal businesses, comprises 98% of the businesses in Rwanda and 41% of all private sector employment — though the formalized sector has much growth potential with only 300,000 currently employed. Most micro and small enterprises employ up to four people, showing that growth in the sector would create significant private sector non-agricultural employment opportunities. Among 585 companies certified by RSB, only 25 are involved in food fortification with focus on nutrient content including Cereals (Maize, Wheat), Milk products, Sugar, Oil and Salt. These foods share some or all of the following characteristics: i) They are consumed by a large proportion of the population, including (or especially) the population groups at greatest risk of deficiency; ii) They are consumed on a regular basis, in adequate and relatively consistent amounts; iii) They can be centrally processed (central processing is preferable for a number of reasons, but primarily because the fewer the number of locations where fortificants are added, the easier it is to implement quality control measures; monitoring and enforcement procedures are also likely to be more effective); iv) Allow a nutrient premix to be added relatively easily using low-cost technology, and in such a way so as to ensure an even distribution within batches of the product and v) Are used relatively soon after production and purchase. Foods that are purchased and used within a short period of time of processing tend to have better vitamin retention, and fewer sensorial changes due to the need for only a small overage.

The choice of fortificant compound is often a compromise between reasonable cost, bioavailability from the diet, and the acceptance of any sensory changes. When selecting the most appropriate chemical form of a given micronutrient, the main considerations and concerns are thus: i) Sensory problems: Fortificants must not cause unacceptable sensory problems (e.g. colour, flavour, odour or texture) at the level of intended fortification, or segregate out from the food matrix, and they must be stable within given limits. If additional packaging is needed to improve stability of the added fortificant, it is helpful if this does not add significantly to the cost of the product and make it unaffordable to the consumer; ii) Interactions: The likelihood or potential for interactions between the added micronutrient and the food vehicle, and with other nutrients (either added or naturally present), in particular any interactions that might interfere with the metabolic utilization of the fortificant, needs to be assessed and checked prior to the implementation of a fortification programme; iii) Cost: The cost of fortification must not affect the affordability of the food nor its competitivity with the unfortified alternative; iv) Bioavailability: The fortificant must be sufficiently well absorbed from the food vehicle and be able to improve the micronutrient status of the target population and v) Safety is also an important consideration: The level of consumption that is required for fortification to be effective must be compatible with a healthy diet.

With regards to the challenges faced by food industries, the majority of food companies are not located in industrial zones, and it has been claimed that these zones were not well structured to accommodate different food industries depending on their size, nature and capacity. In addition, in the production systems, unreliable supply of raw materials; packaging materials, unfair market competition and limited working capital are key issues that significantly affect their production performance.

Recommendations

The following are the recommendations to promote the food fortification in Rwanda and increase the SMEs involved:

(i) To Policy Makers (GOR):

1) Sign the Decree and Food Fortification regulations (Product fortification and bio-fortification)
2) For importation and in country fortification, make mandatory the fortification with focus the community consumption habitudes including Maize, Wheat, Sugar and Oil. Salt is already fortified.
3) The FDA and MINICOM should avail information to all on the available SMEs involved in Food fortification, facilitate the registration and certification of those involved and Increase funding for food fortification at large scale.
4) Increase RSB laboratory capacities to test all foods and monitor SMEs.
5) Regulate demand for food fortification at the community level and supply with reduction of tax on the import of raw materials

(ii) To Industries:

6) Improve quality of inputs, product packaging, handling with required safety
7) Increase processing procedures and expertise according to RSB standards
8) Respect purposeful fortification.
9) Expend the market to rural areas

(iii) To Nutrition Stakeholders:

10) Nutrition actors should continue to advocate for food fortification in Rwanda and market prices to be affordable for the vulnerable people who are more exposed to malnutrition and continue with their consumption to eradicate malnutrition.
11) V4CP should advocate for food fortification data in Rwanda and purposeful fortification to industries.
12) Creating an enabling environment – in this case, one that makes adequately fortified foods widely available and provides the means for individuals to acquire them;
13) Helping individuals adopt healthful behaviours – in this case, behaviours that enhance the contribution of fortified foods to their micronutrient status.
14) Advocate for SMEs to acquire the raw materials, packaging and fair market. This will low the cost of fortified foods at the market and affordable for the poor.

(v) To Media:

15) Inform the consumers about the available nutritious foods and importance of consume them

8. References:

1) Wikipedia: https://en.wikipedia.org/wiki/Human_nutrition(July 05,2020)
2) Food and Agriculture Organization of the United Nations (FAO)/Global Alliance for Improved Nutrition (GAIN): Leveraging Small and Medium Enterprises to improve nutrition
3) MINISTRY OF TRADE AND INDUSTRY (MINICOM): http://www.minicom.gov.rw/fileadmin/minicom_publications/Planning_documents/Annual_Report_2015-2016.pdf
4) MINICOM: http://www.minicom.gov.rw/fileadmin/minicom_publications/Reports/minicom_smes_product_clusters_booklet.pdf

5) SNV/Voice for Change Partnership: *Improving public participation in government budget tracking: lessons learned from Honduras, Indonesia, Kenya, and Rwanda (July 22, 2020; Rwanda Virtual Presentation)*
6) https://rsb.gov.rw/Food Fortification (July 30,2020)
7) Food Fortification Regulation in Rwanda, Presentation from Moses NDAYISENGA(October 2016); http://ffinetwork.org/about/calendar/2016/documents/Day2-3-3Rwanda%20.pdf
8) WHO/FAO Guidelines on food fortification with micronutrients
9) MINISTRY OF TRADE AND INDUSTRY-Small and Medium Enterprises (SMEs) Development Policy (June 2010)
10) Uwitonze Marc, SMALL AND MEDIUM ENTERPRISES AND JOB CREATION IN RWANDA, 2016
11) DRAFT REPORT on REEB GENERAL COMPANY LTD- "Mapping of Food Processing Industries in Rwanda
12) Omar Dary and Michael Hainsworth, The Food Fortification Formulator: Technical Determination of Fortification Levels and Standards for Mass Fortification, 2008
13) DUHAMIC-ADRI, PROGRESS REPORT ON FOOD FORTIFICATION IN RWANDA, 2019
14) DUHAMIC-ADRI, Food Fortification and Techniques in Rwanda, 2020
15) World Bank, Investing in Nutrition, The future development, 2019