

# A Reflection of the South African Maize Meal and Wheat Flour Fortification Programme (2004 to 2007)



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Department:  
Health  
REPUBLIC OF SOUTH AFRICA



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Global Alliance for  
Improved Nutrition



# A Reflection of the South African Maize Meal and Wheat Flour Fortification Programme (2004 to 2007)

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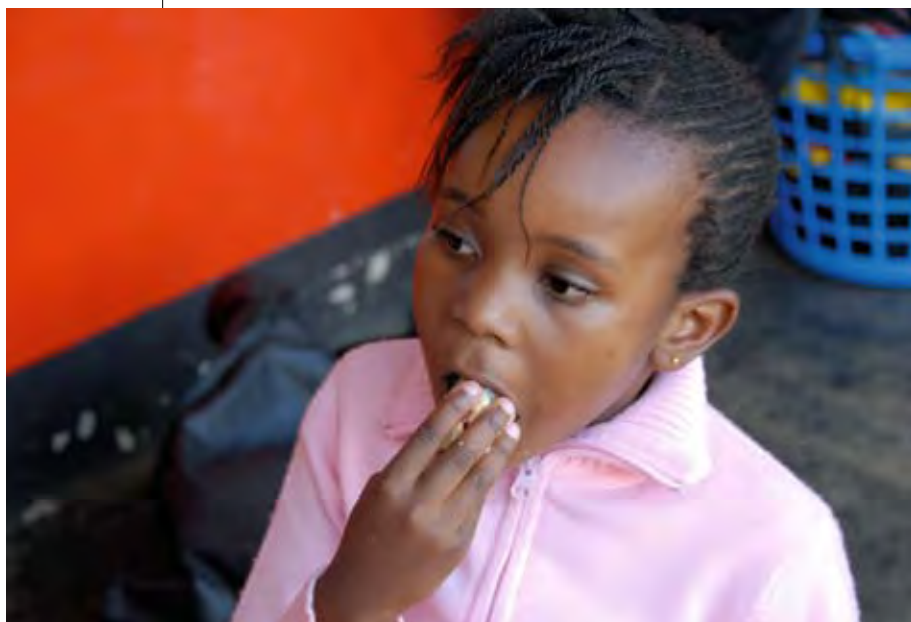


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## LIST OF ACRONYMS

<b>CDC</b>	Centre for Disease Control, Atlanta
<b>DBSA</b>	Development Bank of Southern Africa
<b>DIT</b>	Durban Institute of Technology
<b>DoH</b>	Department of Health
<b>DTI</b>	Department of Trade and Industry
<b>EHP</b>	Environmental Health Practitioner
<b>GAIN</b>	Global Alliance for Improved Nutrition
<b>MI</b>	Micronutrient Initiative
<b>NAMM</b>	National Association of Maize Millers
<b>NCM</b>	National Chamber of Milling
<b>NFA</b>	National Fortification Alliance
<b>NTD</b>	Neural Tube Defects
<b>RDA</b>	Recommended Dietary Allowance
<b>SABC</b>	South African Broadcast Company
<b>SABS</b>	South African Bureau of Standards
<b>TUT</b>	Tshwane University of Technology
<b>UNICEF</b>	United Nations Children's Fund



## PROJECT PARTNERS AND THEIR CONTRIBUTIONS

**Department of Health for the Republic of South Africa (DoH)** – the lead implementing agency and coordinator of the NFA.

**Global Alliance for Improved Nutrition (GAIN)** – funder of the Food Fortification Programme for the period 2004 to 2007.

**United Nation's Children Fund (UNICEF)** – executing agency

**Development Bank of Southern African** – the fiduciary agent appointed by GAIN for oversight on the project.

**National Fortification Alliance (NFA)** – alliance coordinating implementation of the Food Fortification Programme under the leadership of the Department of Health, Nutrition Directorate

**The Micronutrient Initiative** – initial international funding provider and member of the NFA.

**National Chamber of Milling (NCM)** – representing the milling industry on the NFA.

**The National Chamber of Baking** – representing the baking industry on the NFA.

**Tshwane University of Technology (TUT)** – provider of training to Environmental Health Practitioners, including the creation of the training and mentorship manual.

**Municipality-based Environmental Health Practitioners** – individuals responsible for the compliance monitoring and enforcement of millers.

**The Consumer Goods Council** – a consumer rights monitor.

**South African Bureau of Standards (SABS)** – national body responsible for sampling, testing, certifying and monitoring products sold to the public.

## INTRODUCTION

A comprehensive study on the nutritional status of pre-school children supported by the Department of Health (DoH) and published in 1995 by the South African Vitamin A Consultative Group (SAVACG) showed that one-third of the country's children under six years of age were vitamin A deficient and one-fifth of children were anaemic.

Anthropometric measures also showed that 1.5 million children were stunted; a problem that was particularly evident among children who lived in traditional housing in rural areas and whose mothers had lower levels of education. The study concluded with recommendations to the Department of Health to investigate the feasibility of food fortification as a medium-term strategy for improving the vitamin A status of children.

Research conducted in 1997 under the auspices of the Health Systems Trust, a South African non-governmental organisation, supported the findings of the 1995 report. Entitled *The Nutritional Status of South Africans: A Review of the Literature from 1975-1996*, it collated the results from four national studies and several smaller-scale studies to conclude that up to 25% of preschool children and at least 20% of primary school children were stunted from malnutrition. This study also referred to fortification as a possible strategy for improving the intake of essential micronutrients.

Globally there is evidence that three micronutrient deficiencies are of public health concern amongst children. They are vitamin A, iodine and iron deficiencies. Communities particularly affected are those in situations where poverty, unemployment, civil unrest, war and exploitation remain endemic. Within South Africa there is concern about these deficiencies among children under the age of five and women of childbearing age. The most vulnerable groups are rural blacks, coloured children and women as, on average, their households do not earn enough money to address food deficiencies through diet or by taking supplements.

Collectively, the three micronutrient deficiencies contribute to growth retardation, brain damage, diminished cognitive function and diminished working capacity in children and adults, as well as increased susceptibility and severity of infections and mortality. Their importance to cognitive function and overall health rationalises the high priority food fortification currently receives worldwide. The World Bank estimates that economic losses attributed to malnutrition range from 6 to 12% of the GNP of developing countries. In this regard, if a figure of a 6% loss were applicable to South Africa, the cost of undernutrition alone could amount to at least four billion rand. If the cost of the chronically and acutely ill patients who are undernourished is taken into account, the loss could be far higher.

### EXCERPTS FROM SOUTH AFRICAN VITAMIN A CONSULTATIVE GROUP (SAVACG)

(Source: [www.sahealthinfo.org/nutrition/vitamina.htm](http://www.sahealthinfo.org/nutrition/vitamina.htm))

#### MAIN FINDINGS

Findings on the main objectives:

##### Vitamin A status

- One in three children had a marginal vitamin A status (serum vitamin A concentration below 20  $\mu$ g/dL). Children living in the rural areas and whose mothers were poorly educated were the most disadvantaged. According to international criteria, the national prevalence (33%) of marginal vitamin A status found in this study identifies the country as having a serious public health problem of vitamin A deficiency.

##### Iron status

- One in five children in the country was anaemic, one in fifteen moderately anaemic and one in five hundred severely anaemic. In terms of iron status, one in ten children was iron depleted or deficient, one in twenty was severely iron depleted or deficient and one in twenty had iron deficiency anaemia. Anaemia

and poor iron status were more prevalent in urban areas. Children in the 6 to 23 month age group were the most severely affected.

- As a group, children with marginal vitamin A status were at a significantly higher risk of also being anaemic and of having iron deficiency anaemia; children with vitamin A deficiency (serum vitamin A concentration <10  $\mu$ g/dL) were at even higher risk of being anaemic.
- Three out of twenty children would appear to have had an underlying infection or inflammation, or alternatively might have had an underlying folate or vitamin B12 deficiency.

##### Anthropometric status

- Almost one in four children was stunted and one in ten underweight. This translates into approximately 660,000 preschool children being identifiably malnourished and 1,520,000 being stunted because of long-term malnutrition.
- According to international criteria, stunting is a major problem in the country, especially in some provinces, and, in general, it was more prevalent in rural than in urban communities, in children living in traditional or informal types of housing and in those whose mothers were less well educated.



### Developing a Solution

Within a year of South Africa's democratisation, the country ratified the UN Convention on the Rights of the Child. In so doing, the country committed itself to prioritise activities towards the virtual elimination of vitamin A, iodine and iron deficiencies. With fortification being a well articulated and established practice that ensures maximal coverage of micronutrients to vulnerable groups, the Department of Health began to consult with third parties on implementing a national Fortification Programme. Since 1996, representatives from government, industry, academia, and consumer organisations discussed the feasibility of launching a staple-food fortification programme, developing recommendations for government to draft legislation that would make fortification compulsory within the food industry. As maize and bread are the staple food of the large majority of South Africans, the government decided to make it mandatory to fortify all white and brown bread flour and maize meal (super, special, sifted and unsifted) with eight micronutrients (six vitamins and two minerals) in sufficient quantities.

On 7 October 2003, legislation came into effect requiring any person who manufactures, imports, or sells bread wheat flour and maize meal to fortify them or be guilty of an offence punishable by a fine of up to R125,000. This applies to large and small millers, urban, peri-urban and especially rural.

The regulation is contained in the Foodstuffs, Cosmetics and Disinfectants Act (Act No. 54) of 1972 and it designates the following to be added to maize meal and wheat flour:

Vitamins:

- Vitamin A
- Thiamin (Vitamin B1)
- Riboflavin (Vitamin B2)
- Niacin
- Folic Acid
- Pyridoxine (Vitamin B6)

Minerals:

- Iron
- Zinc

The fortification regulations also stipulate that a miller must (1) keep monthly records, (2) store the fortification mix under proper conditions (defined by the manufacturer), and (3) maintain strict stock rotation to prevent the packaged goods from losing potency by sitting on store shelves beyond expiry dates.

### Packaging

Packaging was covered in the regulations. Shelled goods must have proper labelling on their packages in accordance with the Regulations Relating to the Fortification of Certain Foodstuffs, R504 (7 April 2003). If the fortification logo is used, it must be displayed along with a nutrition declaration table. Both serve to inform the consumer that the item is fortified and meets a certain percentage of the Recommended Dietary Allowance (RDA) per serving. The logo was pre-tested in both rural and urban communities and was selected to be ideal for the South African consumers.

### Overcoming initial concerns

There were initial industry concerns over changes to the colour, texture and taste of mealie pap. These concerns quickly abated as consumer taste panels and food laboratories found that the fortified foods did not change significantly in colour, texture or taste.

Cost was also a concern. Consumers questioned whether the additional cost of fortification mixes was going to increase the cost of staple foods, making them unaffordable to the target market and jeopardising the profits of the milling



Fortification logo selected by rural and urban communities



industry. It was quickly discovered that the cost of the fortification mix and the amount passed onto the consumer would be nominal. Fortification mix costs were calculated to be approximately R30 per ton. This translates into about a one cent increase per loaf of bread and two cents per kilogram of maize meal.

#### Why Are These Nutrients Important?

Micronutrients are essential vitamins and minerals needed in small quantities for our bodies to function healthily and efficiently. On its own, the body does not produce these nutrients in adequate quantities and so they must be regularly provided through the foods we eat.

Micronutrients contribute to the following bodily functions:

- Helping our organs (heart, lungs, skin, muscles, nervous and immune system, etc) to function properly.
- Making the blood healthy and boosting the immune system.
- Reducing the risk of disease, infections and illnesses (e.g. arthritis, cancer, cardiovascular disease, diabetes, etc.).
- Keeping eyes healthy.
- Helping to build a strong skeletal structure (bones and teeth).
- Helping brain development and cognitive function.
- Keeping the muscles healthy and contracting properly.
- Minimising the effects of aging and air pollution.
- Ensuring the body grows to its proper height and weight.

The best foods to eat in order to naturally acquire these nutrients are legumes, vegetables, fruits, and animal and fish products. But the

reality is many people in developing or underdeveloped countries are not able to maintain a consistent or balanced diet of these foods.

Adding fortification to everyday staple products means those who are most deprived of essential vitamins and minerals can obtain significant levels of them through a diet they can afford. Not only do people become healthier but they also live longer, leading more productive lives. Infant mortality is less likely to occur and children show higher levels of physical and mental development; resulting in improved performance in school.

#### The Process of Fortifying Food

Food fortification mixes are prepared by commercial companies, usually from the pharmaceutical industry. Each batch must be accompanied by a certified analysis of micronutrient content. The miller must keep the fortification mix dry and out of direct sunlight in order not to compromise the strength of the mixture. In order for millers to properly fortify foods, they require the following:

- Appropriate equipment and mill infrastructure modifications.
- Acquisition of fortification mixes from manufacturers/suppliers/importers that have been registered by the Department of Health.
- Knowledge of adding the appropriate amount of fortification mix to the grain while it is being milled or adding fortification mix to the product meal in a blender, after the grain is milled.

There are two main methods used to fortify maize meal and bread flour. These are continuous mixing and batch mixing. Continuous mixing can either be done manually or automatically. If done manually, the fortification mix is added either by weight or volumetric measure to a known volume of grain prior to milling. If automatic, a precision micro-ingredient powder feeder is attached to the mill and dispenses an amount of fortification mix proportional to the meal or flour. This method is typically more cost effective and precise.

Batch mixing entails the fortification mix being blended with maize or wheat flour after the milling process is complete, but before packaging. The benefit with this method is that the equipment is not large and can be easily fitted to most mills without major changes or costs. However, this method is slower and more labour intensive, and arguably not as effective as the automatic continuous mixing process.

## The Challenge of Food Fortification

Food fortification is a relatively simple technological process; however, there are many variables that affect the positive health benefits of fortification. They include:

- The stability of the micronutrients in the fortification mix.
- Loss of vitamin A, riboflavin and folic acid over time or due to sunlight exposure.
- Successful monitoring of mills and fortification mix manufacturers/suppliers/importers.

### Fortification mix stability

It is essential that fortification mixes have the appropriate stability and quality of vitamins and minerals needed to fortify foods headed for retail outlets. There is evidence that some supplier's mixes are of better quality, hence longer lasting than others. A small cost differential exists between the more stable mix and the lesser quality mix (approximately US\$30 or R210). Despite fractional differences in costs which hardly seem relevant when weighed against the social relevance, millers are not required to choose the more stable mix; they are merely required to add a mix.

### Micronutrient losses

There is a certain percentage of micronutrients expected to be lost in the fortification process during the preparation, blending, storage or distribution of the product. It is therefore important that the vitamin and mineral levels be sufficiently high to account for foreseeable losses in stability along the course to retail. These potential losses were taken into account when the fortification addition levels were formulated. Having batches that are less stable in some micronutrients also means no benefits will accrue to the consumer who digests them. Overdosing the fortification mix is also not an option as doing so could jeopardise public safety.

### Monitoring

Effectively monitoring fortification mix manufacturers/suppliers/importers as well as millers, and having laboratory test results, are all critical to the food fortification regulatory process. Monitoring is essential to ensure the quality of fortified food that is released into the market. The nutrient content of the fortified food must

be within the requisite range to have the desired impact on public health.

Monitoring requires trained professionals to take samples of the fortification mix as well as samples from the mills and products on store shelves. They are also required to do site visits to survey whether or not the mills have functioning fortification equipment and fortification mix and are actually correctly mixing it into the maize meal or wheat flour. While results of site visits are recorded, the samples taken are sent to a laboratory for analysis. Environmental Health Practitioners (EHPs) conduct site visits and collect samples from millers.

Monitoring, and its inherent challenges, will be discussed in further detail under the *Monitoring and Evaluation* section of this report.



**According to the fortification regulations under the Foodstuffs, Cosmetics and Disinfectants Act (Act No. 54) of 1972, the following steps must be taken by the manufacturers of maize meal and bread flour:**

1. Purchase blending equipment and/or feeder(s) and weighing scales.
2. Learn how to use the equipment properly.
3. Purchase fortification mix from suppliers that have been registered with the Department of Health.
4. Store fortification mix where it is protected from exposure to light and heat. Preferably, keep fortification mixes in their original containers.
5. Obtain and keep on record a certificate of compliance (COA) for every batch of fortification mix.
6. Employ and adhere to strict stock rotation procedures in order to prevent old stock from losing potency and to comply with the shelf life expiry date.
7. Keep records of grain procurement.
8. Keep records of fortification mix inventory and usage.
9. Keep production records of the amount of fortified maize meal or bread flour produced.
10. Keep monthly records of the amount of fortification mixes used every month.
11. Ensure that all critical stages of the manufacturing process are monitored through the following measures:
  - a. checking of fortification mix feeders at least once per shift to ensure that they are delivering at the correct dosage levels
  - b. performing visual checks at least twice per shift to ensure that fortification mixes are being used and that no blockages have occurred and keeping a record of this
  - c. performing regular iron spot tests on the maize meal or bread flour
12. Make these records available for inspection by the Environmental Health Practitioners (EHP) when required.

## BACKGROUND

The genesis for the development of a national Food Fortification Programme arose from a consensus workshop between government, industry, professional food and nutrition associations and researchers in 1996. Discussion with the MI in 1997 (with funding routed through UNICEF) generated an overall framework for food fortification. It included a series of preparatory studies starting with a food consumption survey in 1999 that identified wheat and maize flour as the most appropriate vehicles for micronutrients to reach a broad section of the population. This was followed by industry studies to understand the operation of the industry – both large and small scale.

On a parallel track, the CSIR was contracted to undertake stability and consumer acceptability studies. The next major challenge was to bring the milling and baking industry on board with a communications strategy aimed at garnering an agreement for mandatory fortification, fortification levels, regulation and monitoring, quality assurance and enforcement requirements. Small millers, who represent about 30% of the maize milling and less than 5% of wheat flour milling, were specially targeted since they supply the more vulnerable populations. The launch of the Fortification Programme in 2003 marked the transition of external funding for the project from MI to GAIN. MI funding for the project has totalled approximately at US\$2 million to which GAIN contributed an additional US\$2.8 million. MI also provided bridge funding to cover essential needs for the time between the approval of the GAIN funds and their disbursement.



## THE FOOD FORTIFICATION PROJECT

In October 2002, the National Food Fortification Task Group requested US\$2.7 million (later amended to US\$2.8 million) from GAIN over three years.

Four key areas were identified for support. They were:

1. **Compliance Monitoring and Enforcement Training:** Funds were provided for start-up training and mobilisation of municipal-level Environmental Health Practitioners (EHPs). The GAIN project helped support efforts to encourage compliance with fortification legislation by small, unregistered millers through training and communications.
2. **Social Marketing and Communications:** Funding was provided for the development of social marketing strategies and campaigns to drive consumer knowledge and demand for fortified foods.
3. **Programme Management and Administration:** Funding for this component ensured that UNICEF South Africa could carry out its role as the executing agency of the GAIN grant. UNICEF handled procurement, technical reporting and financial administration. The support also included programme assistance for the National Fortification Alliance (NFA) secretariat, which enabled dialogue between key stakeholders.
4. **Monitoring and Evaluation:** Funds were provided for the development and implementation of a “baseline” study intended to capture biomedical and process data at the start of the fortification process. EHPs, trained in the initial phase of the project, have the mandate to carry out routine monitoring of mills to ensure compliance with food fortification regulations. Funds were also provided for auditing fortification mix manufacturers/suppliers/importers, and equipping laboratories for sample testing.

The GAIN Board of Directors approved the grant in June 2003 and the Development Bank of South Africa (DBSA) was appointed to act as In-Country Project Advisor, responsible for monitoring and fiduciary oversight.

GAIN's grant agreement with UNICEF was signed in early 2004. During this 2003 transition period, MI provided initial funding for a

number of activities, including the EHP training programme, consumer research, development of the fortification logo, communication campaigns and also the development of training materials for small scale millers.

### **Compliance Monitoring and Enforcement Training**

MI funding was allocated to start-up training and mobilization of municipal-level Environmental Health Practitioners (EHPs). These government officers have the mandate to carry out routine monitoring of mills to ensure compliance with food fortification regulations. Funds were also provided for auditing fortification mix manufacturers/suppliers/importers, and equipping laboratories for sample testing.

In addition, the GAIN project helped support efforts to encourage compliance with fortification legislation among small, unregistered millers through training and communications.

Large millers were aware of and accepted the fact that they would be expected to absorb most of the cost associated with fortification. This included the cost of acquiring fortification mix and equipment, as well as employee training, new packaging and consumer advertising.

Larger millers had concerns about the capacity of the Department of Health (DoH) to encourage compliance. Their concerns were valid given that most small millers do not have the capital to pay for fortification equipment and numerous small rural millers are outside the control of a national regulating association. Small millers produce approximately 30% of all maize milled in South Africa. They cater to the most poor, isolated and neglected communities, who are arguably the most in need of fortified maize meal and wheat flour.

In response to the concern, the Department of Health, in partnership with the Department of Trade and Industry, created an incentive scheme to subsidise the costs incurred by large, medium and small millers for the purchase and installation of fortification equipment. The subsidy scheme was structured as follows:

- Small millers – 100% reimbursement
- Medium sized millers – 75% reimbursement
- Large millers – 50% reimbursement

Millers that do not register as tax-paying businesses will not qualify for the subsidised equipment.

To further increase compliance among small millers, MI provided funds towards a large-scale mapping and needs assessment project which was conducted by the University of Pretoria. The exercise identified small millers who required not only financial support but also training to ensure understanding of their obligations under the new legislation, and it located them for future monitoring.



### **Issues and challenges**

Several issues were discovered during discussions with the milling industry. They included:

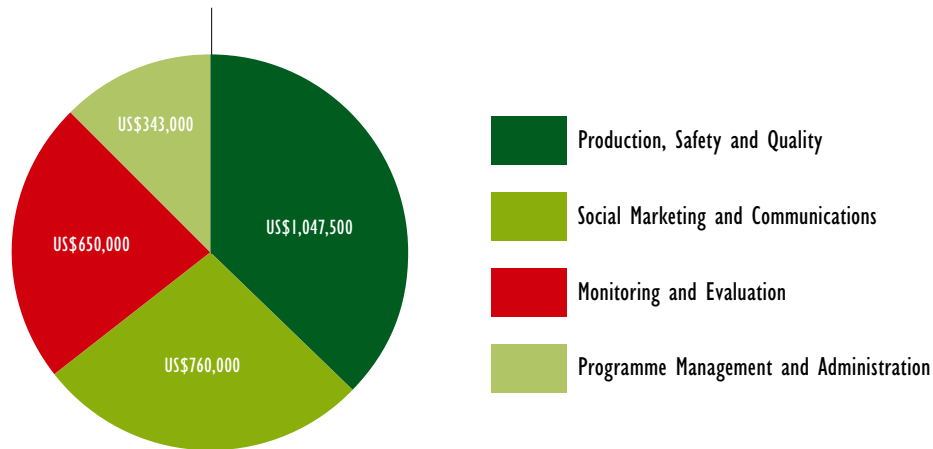
- The industry's concern over the impact of fortification on sales.
- The great distrust and competition between small and large sized millers.
- The complexity of finding small millers throughout rural areas due to their remoteness, seasonality or desire not to be found.
- The impact of government bureaucracy and the length of time it takes for government budgetary commitments to be released.

### **Industry concern over the impact of fortification on sales**

While millers agreed to participate in fortification and acknowledged its social benefits, there was concern over the impact of the additional cost being passed onto the consumer; namely whether the increased costs would act as a disincentive to purchase. Additionally, there was concern about whether the colour variation to the maize meal would meet resistance amongst consumers, since maize meal fortified with riboflavin at levels higher than stipulated in the regulations give a yellowish tint.

Fortunately, sales have remained steady, according to the National Chamber of Milling (NCM). Fortification has neither driven sales, nor has it discouraged them.

The milling industry has shifted their concern to the fact that small millers are not complying and, as a result, are getting a cost advantage. There is clear discontent amongst millers that the government is not doing enough to enforce compliance at any level.



### Allocation of expenditures

#### **Distrust and competition between small and large-sized millers**

There is a pervasive sentiment amongst small millers that the legislation was in some way created to force them out of the market. The close association and reliance upon large millers via the National Chamber of Milling and the South African Chamber of Baking throughout the legislative and implementation process may have contributed to that belief. It became evident in the process that for quite some time the market relationship between small millers and the larger ones sitting on the National Chamber of Milling has been a volatile one.

According to P-Cubed, consultants on the project responsible for interfacing with small millers, there have been a few micro and seasonal millers who have opted to discontinue milling operations. The new regulations, along with the purchase of new equipment, fortification mix, training, monitoring requirements and potential fines for non-compliance made them conclude that, as an activity that is not core business, milling was no longer beneficial to them or their farms.

#### **The complexity of finding small millers**

The mapping of small scale millers in order to enter them into a national database disclosed an interesting fact; many small mill-

ers did not want to be found. Many of them also did not want to make themselves available to talk with strangers towards whom they showed a measure of distrust. Additionally, some of the mills in rural areas are located in such remote areas they are almost impossible to find. The seasonality by which some of them operate is also an issue. If EHPs do not reach them during their operation season, there will be great difficulty in monitoring them, let alone giving them the necessary information about fortification and the subsidies available to assist them with compliance. Then of course, there are those millers who just do not want to be found; again because they perceive "outsiders" as potential threats to their business or autonomy.

#### **Government bureaucracy**

Government bureaucracy is an unfortunate reality. The time required to motivate for budgetary support from the Department of Trade and Industry (DTI) has greatly dampened the momentum of the project. It has taken nearly four years to get approval for an allocation of funding for the equipment subsidy programme. In the eyes of private industry, this is an excessively long period of time, leading them to suspect that government has left the burden of the programme on their shoulders.

The National Chamber of Milling expressed their dissatisfaction by refusing to allocate any time to the Fortification Programme until



such time as the government has delivered on its obligations, which according to the Chamber were:

- The payment of the incentives to subsidise some of the capital outlay as agreed upon in 2003.
- A proper policing system as they suspect that only  $\pm 70\%$  of all maize meal in South Africa is being fortified.

Government officials from the DoH are sympathetic to the National Chamber of Milling's response, noting however that the delays were unavoidable due to government processes.

Others have expressed displeasure at the National Chamber of Milling and the South African Chamber of Baking's stance, noting that if their interests were genuine they would allow government processes to unfold without threatening non-participation. Despite the fact that small millers benefit from charging increased prices for maize when they do not incur the actual cost of fortification, or that they charge lower prices that compete with larger millers who must charge higher prices to cover the cost of fortifying their maize, large maize millers comprise 70% of the market and their compliance is essential to ensure that the majority of maize meal that reaches the market is fortified.

At the time of publication, the DoH was preparing to announce the availability of the DTI subsidy and their ability to begin reimbursing large millers and upgrading small millers with equipment so that all levels of millers are compliant with legislation. The DoH fully intends to revitalise the partnership between the government and the milling private sector now that they can fulfil their commitments to the industry. The DoH expressed the importance of the relationship with the National Chamber of Milling and the South African Chamber of Baking and credits the organisations with making the Food Fortification Programme a reality. Without the industry, the programme would be non-existent and they seen to be vital to the future success of the programme.

There were two deliverables in this segment of the project: (1) to create a curriculum and mentor's guide approved by the DoH with input from the Micronutrient Initiative and UNICEF and (2) to train practicing EHPs to understand and monitor food fortification. Once a regulation becomes law, there must be a system of policing and monitoring to ensure compliance. The ideal situation is that once a law is passed all relevant parties comply with it.

However, the reality is that there will always be a small percentage of people who attempt to side-step regulations, either because they do not understand, respect or desire to pay the cost in time or money required to adhere to them. For example, the majority of drivers obey the laws of the road. There is only a small fraction that break the law by speeding, making illegal turns, etc. They justify the need for traffic officers, not only to give fines to those making the infractions but also to set an example to law-abiding citizens that non-compliance will be punished; hence encouraging them to continue following the law.

Environmental Health Practitioners (EHPs) can be considered "health police". They operate at a local government level and are responsible for compliance monitoring and law enforcement of national food safety. Food fortification has recently been added to a plethora of other duties they are mandated to perform. Prior to 2003, food fortification was not part of their mandate. They therefore had to be trained in order to understand the law and their new duty of monitoring the industry.

The Department of Health's Food Control and Nutrition Directorates, Tshwane University of Technology (who chaired the consortium of training institutions) developed a curriculum and training manual to train practicing EHPs on fortification.

Sensitisation training occurred during a two-day workshop to make current practitioners aware of food fortification.

Training occurred at five accredited institutions around the country to ensure complete coverage of all provinces and timely completion of the training needs required for the sustainability of the project. The participating institutions included the Tshwane University of Technology, the Central University of Technology – Free State, the Cape Technikon, the Durban Institute of Technology and the Port Elizabeth Technikon.

At the end of the course, the learners were evaluated to determine their understanding of the course content. This evaluation was focused on the practical application of the information. Training teams consisted of a nutritionist/dietitian (Module 1), a food technologist (Module 2) and an environmental health practitioner (Module 3). The Tshwane University of Technology issued certificates to all learners who earned a 50% pass mark.

New EHPs obtain a B Tech degree in Environmental Health from institutions providing courses. The fortification training modules that



were created now form part of the national curriculum of EHPs; hence all accrediting South African institutions must train EHPs on the modules, which include:

- **Fortification principles** – To give EHPs an understanding of the human body's needs for micronutrients, the consequences of deficiencies and the role of fortification to prevent these consequences.
- **Milling and the fortification process** – To ensure that the participant knows and understands the process of milling and where and how the addition of the fortification mix takes place.
- **Monitoring Systems** – To give EHPs guidance on the monitoring of maize meal and bread flour manufacturers in terms of the fortification of these products in order to determine compliance with the legislation.

It was important for EHPs to understand that they are to monitor and sample at the level of milling, just after the fortification mix has been added to maize meal or bread flour. They are not qualified to test the fortification mix itself.

They monitor millers, not fortification mix manufacturers/suppliers/importers. They must take samples at the mill in order to nullify any millers' attempt, when improper levels of vitamins and minerals are found in their products, to shift blame away from their non-

compliance onto climate, transportation, storage and a host of other factors that affect the levels once the product leaves the mill.

The success of this programme was that where no training programme previously existed, there is now a national framework for all new EHPs to be trained. Also, 1,526 EHPs have nationally been trained and have accepted their role as the policing mechanism for fortification.

### Issues and challenges

Issues and challenges discovered during this phase of the project included:

- Shifting the mindset of EHPs who believed that food fortification is not their issue because it does not involve an eminent or dangerous "public health hazard" but is rather a preventative health issue.
- The challenge of overcoming the excessive demands already placed on EHPs' daily duties.
- Retailers are not informed how to store maize meal and bread flour products in order to protect levels of fortification.
- Initial sampling results were not favourable.
- Structural changes in the government which have a direct impact on who monitors, directs and holds EHPs accountable on matters relating to food fortification.
- Discovering that EHPs are not best suited to monitor or test fortification mix manufacturers/suppliers/importers.
- EHPs taking samples from retail outlets rather than going all the way out to the mills (distance and demand).
- Overburdening of laboratories responsible for testing samples.

### Shifting the mindset of EHPs

The initial response of EHPs was to reject the idea that fortification is an issue for them as health inspectors. Some participants expressed the view that their role is to keep the public safe from potentially dangerous foods and unsanitary conditions that threaten the public's health.

This mindset made sensitisation training an essential module. A workshop held over two full days was implemented to make current practitioners aware of the importance and societal benefits of food fortification.

### **The excessive demands currently placed on EHPs**

There was resistance by EHPs to have yet another responsibility added to the plethora of tasks they are already have. Just in the area of food inspection, they are in charge of:

- Promoting hygienic handling of food within all food establishments as well as informal sale of food (hawkers).
- Inspections.
- Investigations (food poisoning).
- Monitoring for safe meat supplies.
- Ensuring a safe milk and milk product supply.
- Condemnations.
- Education and enforcement of legislation.
- Food composition, quality and labelling.
- Licensing of food premises.
- Surveys (contamination from toxins).
- The issuing of public warnings.
- Creating awareness with regard to the overuse of cooking oils.

After the first day of the sensitisation workshops, the EHPs were fully supportive of the role they now would play; namely taking samples from millers to monitor their compliance with legislation. They were able to understand that they were in the best position to take samples from millers and that instead of being only responsive to health violations they were helping the DoH to implement pre-emptive measures. However, food fortification is not an immediate priority, but it has at least gained their approval.

While the additional task admittedly creates another undertaking for individuals already burdened with serious threats to public health that rightfully take priority over monitoring fortification, EHPs buy-in has been achieved and strategies for curative measures are being mulled over to solve issues of capacity. Together with their additional tasks, they also lack resources and the proper equipment to take samples adequately.

An information database where EHPs' information can be captured is needed. This national database will consist of compiled reports on mills across the country that have been checked for compliance. It will identify those who have failed and those who have been in compliance. This will help EHPs determine which mills require monitoring on a more frequent basis. It will also assist in compiling statistics on the success of the fortification initiative.

### **Training retailers**

It was discovered that many smaller retailers are outlets used by the most vulnerable communities. They often do not store or shelve maize meal or bread flour products adequately. For example, a small tuck shop may put maize on a high shelf to attract customers; however, in so doing, that maize meal is exposed to sunlight for several hours. This affects the stability of the nutrients in the product, which will result in losses of these nutrients. If that product remains on the shelf for several days, by the time it is purchased and consumed some of the most important vitamins are non-existent, and hence does not contribute to the enhanced health of the family that eats it.

Arguably, millers or distributors should be responsible for instructing retailers on how to store and shelve the product. This can be done by means of a warning label or instructions in various languages.



### **Government structures**

A huge challenge to the programme is the inability of the national government to control the actions of EHPs or to access their reports as and when needed at provincial or national level.

Under the new health act, municipalities are now responsible for local health issues as they are deemed to be in a better position to identify and solve local problems. The process of conversion is still under way and has a serious impact on EHP service delivery for food fortification.

Since legislatively the provincial health department does not have jurisdiction over EHPs they do not have the authority to direct their functions or reporting procedures; this despite the fact that EHPs are still on the provincial payroll.

The problem is compounded by the fact that municipalities do not have control over them either because they have not yet been assigned to a specific municipality and are not on their payroll, making it difficult to ascertain who EHPs must report to.

With EHPs now forming part of the municipal system and reporting to local authorities, it has been demonstrated that local governments may not choose to prioritise a national programme for fortification over local responsibilities. This was discovered in the training phase of the project where one of the country's major

municipalities determined they could not afford to release their EHPs for the three-day training.

Unfortunately, there is not much that can be done to intervene in this process. The political evolution is under way and will eventually settle into place. For the moment, information on mill visits is collected on a rolling basis although not efficiently or timeously.

#### **Monitoring and testing fortification mix manufacturers/suppliers**

Some fortification mixes are better than others in terms of stability of some of the micronutrients. Since there is no regulation governing the stability of the fortification mix, those seeking to comply at the lowest price do so at the expense of the fortification initiative.

EHPs are not adequately trained to monitor fortification mix manufacturers/suppliers/importers. It was determined that in order to enforce fortification the source of vitamin A and iron also had to be monitored. The best, most sustainable, means available was to utilise existing infrastructure. Similar to the use of EHPs, it was determined that the best body to monitor fortification mix manufacturers/suppliers/importers would be the South African Bureau of Standards (SABS) because they are far more technically competent. However, the SABS has no legislative mandate requiring them to handle this task.

The Department of Health entered into negotiations with the SABS, whereby it was agreed that the Bureau would conduct the compliance monitoring on behalf of the DoH. A memorandum of understanding (MOU) was drafted by the legal unit of the SABS and edited by the legal unit of the DoH. In addition to the MOU, the fortification regulations had to be amended to stipulate the strengthened compliance monitoring of fortification mix manufacturers/suppliers/importers. A delay was experienced in obtaining approval from the National Health Council to go ahead. However, approval has now been obtained and the amended regulations are currently being drafted. The MOU will be submitted for signature when the amended regulations are submitted publication in the Government Gazette.

Until the final amended regulations are published and the MOU is signed, the SABS is not under obligation to conduct compliance monitoring. Under the new system, compliance monitoring of fortification mix manufacturers/suppliers/importers must be done every six months and will be at the cost of the fortification mix

manufacturers/suppliers/importers.

In the interim, fortification mix manufacturers/suppliers/importers are required to submit reports of laboratory analyses that were independently conducted at their cost to the government. This is not monitoring. It leaves the control of policing in the hands of those who need to be policed. It would be all too easy for a manufacturer/supplier/importer to create and sample a batch that will pass legislative requirements while all other batches that they sell do not.

Until the final amended regulations are published and the MOU is signed, which will enable the SABS to proceed with full understanding of their obligations and compensation, monitoring of fortification mix manufacturers/suppliers/importers merely remains a critical desired outcome.

#### **Overburdened and under-capacitated laboratories**

Government laboratories are overstretched and overburdened. There are two national laboratories, one in Cape Town and the other in Pretoria, both of which have to focus their primary attention on forensics. This often means that samples submitted by EHPs sit in a laboratory for several weeks. Of course, this has a negative impact on the results and makes measuring the success of the Fortification Programme much more difficult to determine. It also means there cannot be a valid system to monitor food fortification with insufficient laboratories or capacity to test samples on a more immediate basis.

Only one of the two laboratories is noted as being sufficiently equipped to test fortified food samples. Initially, none of the national laboratories were able to test fortified food samples until GAIN stepped in, mobilising additional funding, to equip the laboratories

**Environmental Health Practitioners (EHPs) are governed by the Health Act – 63 of 1977. They are empowered to establish tolerance for poisonous or harmful substances, food additives, or pesticide and other chemical contaminants; and to specify labelling and advertising requirements. Their duties include the inspection of establishments, collecting samples for analysis, and investigating complaints. When violations are found the EHP can seize and destroy products and may implement legal action.**

**EHPs are concerned with administration, inspection, monitoring, education and regulation, as prescribed in environmental health legislation. They act as public arbiters of environmental health standards, maintaining close contact with the community. They develop professional standards and apply them in environmental health.**



to analyse wheat flour and maize meal samples collected by EHPs. GAIN funded “proficiency testing” of these laboratories to determine whether they were capable of carrying out the required analysis to acceptable scientific standards. They were all found to be proficient and up to international standards.

To date, the national forensic laboratories fall under the auspices of the Department of Justice. Hence forensics matters always take precedence over food. There has been a recommendation to create a separate food laboratory that is answerable to the Department of Health. This dedicated laboratory would significantly aid all areas of food control as well as eliminate the competition for laboratory time between food and forensics. The process has already begun. According to the Department of Health’s Food Control Directorate, a feasibility study is under way to determine if a third laboratory in Durban can achieve this objective.

Another recommendation was to send samples to a private lab, such as the SA Grain Laboratory. However, there seems to be inability on the part of the government to send samples to private laboratories due to lack of funding. Large millers take their samples to the SA Grain Laboratory for testing as they are known to have sufficient equipment and capacity.

### **Social Marketing and Communications**

Social marketing was deemed to be a critical aspect of the Fortification Programme. Significant funding was provided for the development of social marketing strategies and campaigns to drive consumer knowledge and demand for fortified foods.

During 2000 and 2001 a broad advocacy campaign was launched through the media to sensitise and inform consumers about the prevalence and consequences of micronutrient deficiencies, the benefits of consuming fortified foods and to address any concerns they may have.

Although the consumer research in 2002 showed that the majority of consumers are in agreement with the Food Fortification Programme, consumer awareness and demand, especially in areas where unfortified maize meal is produced, should be strengthened. In October 2003, at the time when the fortification regulations came

into effect, a media campaign (radio and limited TV) was launched focusing on low to middle socio-economic groups. The following year, another media campaign (radio and printed media) was implemented. Both campaigns included a competition to which consumers could respond to win a prize.

The 2006 media campaign consisted of a 13 week radio campaign on all the African radio stations with of a 30 minute discussion each week with provincial nutrition representatives of the Department of Health. The media campaign was followed with a radio and TV campaign, which started in February 2007.

The media campaign comprised the following components:

#### ***Weekly ten-minute interviews with national/provincial/district spokespersons on the African language stations on the following topics:***

- Maternal nutrition
- Infant and young child nutrition
- Food fortification
- Healthy eating as part of a healthy lifestyle
- Micronutrient deficiencies
- Vitamin A
- Folic acid
- Iodine deficiency disorders (IDD)
- Nutrition for school-age children
- Obesity
- Healthy and economic food choices
- Effect of processing, storage and cooking on the nutrients in food
- Food labelling

#### ***Interviews with key stakeholders on the SABC 1 programme Shift every Wednesday from 21 February to 21 March. The following topics were covered:***

- Good nutrition during pregnancy
- Good nutrition for infants and young children
- Food fortification
- Micronutrient deficiencies
- Nutrition and diseases of lifestyle



Approximately 4,5 million viewers watched each of the above-mentioned *Shift* programmes. Many questions from callers, especially around infant and young child nutrition, were received. This indicates to the Department of Health that there is a need for more information about these areas especially, which the Department of Health intends to address.

### Issues and challenges

A lesson learned from this segment of the fortification project was that budgets allocated to communication should be targeted toward creating a brand for the fortification logo. While it exists on all maize meal packaging, most people do not know what it is, what it represents and hence the logo has no marketable value.

It is recommended that in a future funding cycle, the larger part of the budget be allocated toward monitoring and training at the millers and fortification mix manufacturers. A very valid point was raised by representatives from MI. That question was, “*if we concentrate our focus on training and monitoring/testing millers and get them all to a point where they are fortifying, why would we need to spend so much money on educating the public with the expectation that they will demand fortified staple foods?*”

The point is well taken. If millers know the regulation will be enforced and they sell only fortified foods, there will be no need to implement costly marketing and communication campaigns. Should

so much money be spent on marketing when it is still questionable whether millers are adding fortification or if the strength is sufficient to have an impact on the consumer? Furthermore, if the logo is branded and given market value, large millers will incorporate the fortification message or logo into their marketing campaigns because it will add value to their product. Finally, It is highly unlikely that the poorest of the poor will feel empowered enough to demand fortified food even if they are aware of it and the mill they buy from does not fortify. Their main concern will be to have access to the closest and most consistent source of food.

The alternative argument calls for broader based campaigns similar to those conducted for HIV and AIDS. A representative from the Tshwane University of Technology noted that, “*If so many deaths, especially of infants and children, are attributed to poor nutrition, why are we not implementing large scale campaigns as done with HIV and AIDS? Where are the billboards for fortification and its health benefits?*”

The message here is that fortified foods should be well advertised to all South Africans, especially those in urban and peri-urban areas who have access to the media. Many people from rural villages move to the city but go home to rural areas during weekends and holidays. They can also act as a source of information, especially since families and friends typically have the greatest influence on people’s choices.





If mass marketing is pursued, media training for all officials and stakeholders who publicly discuss food fortification should also be implemented to especially handle aggressive media questions.

### **Programme Management and Administration**

Funds were provided for UNICEF South Africa to act as the executing agency of the GAIN grant. UNICEF handled procurement, technical reporting and financial administration. The support also included a position for a programme assistant to assist the National Fortification Alliance (NFA) secretariat, which enabled dialogue between key stakeholders.

GAIN's primary role was to provide funding. The organisation admittedly came into the South African arena for food fortification quite late, as the process of legislation had already begun. In most countries, GAIN contributes to the creation of legislation. This was unnecessary in South Africa as the legislation had already been promulgated. Besides funding, GAIN collaborates with relevant parties to create guidelines for reporting. They generally take a hands-off approach, beyond setting and monitoring deliverables. In most countries, as in South Africa, GAIN promotes the concept of an alliance between industry, government and NGOs. In their experience alliances contribute to countries being able to take ownership of projects.

At the inception of their involvement, there was a long delay before GAIN could disburse funding. This was due to changes in their executive management as well as changes in reporting guidelines, grant management procedures and the setting up of a regional office in South Africa.

GAIN has recently implemented new systems and procedures to fast-track disbursements, monitor projects and improve reporting frameworks. Hence, if funding is granted in the future, disbursements will occur at a notably different pace.

The Development Bank of South Africa (DBSA) was brought in initially by GAIN to act as a fiduciary agent. DBSA served a function of coordination, budgeting, monitoring and fund disbursement. They also served as an intermediary between government, UNICEF and the milling industry. Many times they facilitated keeping the team and the process going forward. There were unplanned tensions in

relationships between the parties that had to be managed. Eventually, with the restructuring and setting up of local GAIN offices, the DBSA's function as in-country advisor became less necessary.

### **Monitoring and Evaluation**

Funds were provided for development and implementation of a "baseline" study intended to capture biomedical and process data at the start of the fortification process. Field work was conducted by a consortium of universities led by the University of Stellenbosch. Data collection started in February 2005 and concluded in June 2005.

The intrinsic problem with the survey is that due to delays associated with the funding becoming available for the survey, as well as over-expenditure and methodological revisions by the survey team, many millers entered the market during this period, ahead of mandatory legislation in 2003.

This means it will be a challenge to determine if food fortification has or has not had an impact on the general health and nutritional status of the South African poor. Ideally, the "baseline" study should have occurred during the legislative process before fortified staple foods entered the market. This would have created a pure benchmark to compare results against.

The study has instead served as a cross-sectional survey to help inform the design of an integral monitoring system based on using existing health information data processes, such as the ongoing DoH Birth Defects Surveillance System (BDSS). This system enables, amongst others, monitoring of the incidence of neural tube defects. Surveillance of the rates of neural tube defects pre- and post-fortification found that, across four provinces, there was a significant decline in the incidence of neural tube defects following the introduction of fortification. This result has been consistently demonstrated in other countries that have introduced fortified foods into their markets.

Below are extracts from two independently conducted peer-reviewed assessments of the impact of the national Food Fortification Programme on the prevalence of neural tube defects caused by a deficiency of folic acid. The research unequivocally indicates that without this programme many more children in South Africa would have been born with deformities and disabilities that would prevent them from reaching their full developmental potential.

## PUBLIC-PRIVATE PARTNERSHIPS (PPP)

Initially there was grave mistrust by industry of the government and the programme as a whole. It was noted by several partners who were interviewed for this report that industry is also quite mistrustful of other industry players. Because margins are small in their industry, they were wary to support programmes in which their competitors were also participating. The government had to be very cautious not to appear to be favouring one company over the other.

Despite the initial period of tension, it was stated by many in the NFA that without industry participation food fortification would not have happened as quickly as it did. Industry has taken a proactive approach to the legislation. Most large millers who could afford the cost of fortification geared up their facilities and were fortifying foods prior to the legislation becoming effective.

While issues remain and the relationship between the large milling industry and the government is currently strained due to government delays, it is fully anticipated that the alliance will grow stronger now that the DoH is able to fulfil its mandate to subsidise and equip mills.

The potential of the NFA is clear. It can seemingly be an effective body for PPPs to occur. The participatory nature of the alliance has both contributed to and reflected a new democratic culture in South Africa where seemingly opposing parties are able to communicate, debate and shape the industry in which they operate. However, the reality is that industry has repeatedly refused to attend NFA meetings or comment about the Fortification Programme and its participation in it. They simply state that they will continue to abide by the law but will not lend time or resources to the organisation until the government fulfils its obligations.

Ideally, this multi-sectoral NFA with government, industry and civil society working together for mutual benefits in the context of a mandatory legislative framework will become an operable body of fulfilment. This public-private alliance was one of the first in the history of public nutrition in South Africa, and will hopefully evolve to become a case study for other public-private partnerships to follow.



**Preliminary evidence of a decline in the incidence of Neural Tube Defects following folic acid fortification in South Africa**

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**Introduction:** Neural Tube Defects (NTDs) are relatively common birth defects in South Africa. The incidence typically ranges from 1 to 5.5 per 1000 live births, however higher rates of 6 per 1000 live births have been recorded in the Eastern Cape Province. Fortification of staple foods and in particular maize meal and wheat flour with folic acid is known to reduce NTD incidence. In 2003 the South African government implemented mandatory food fortification of staple maize, wheat and maize meal/flour, with enriched rice bran/maize including folic acid.

**Aims:** To establish the incidence of NTD and other congenital conditions among live births, and to determine whether food fortification influences NTD prevalence.

**Methods:** Since the beginning of 2003 we have been conducting surveillance of NTD (spina bifida, anencephaly, Sacro Spina and Encephalocele) and other primary birth defects such as cleft lip and palate, Down syndrome and other chromosomal abnormalities of South Africa. In each provincial site appropriate health care workers (nurses) leading to clinical registration of primary conditions by a medical geneticist. Cases are extracted from patient hospital records and forwarded to a designated surveillance team by the surveillance team who requested primary birth defect conditions before and after food fortification tracking 23 000 births per annum.

**Results:** The results below show observed incidence rates and also the rate of NTD in other primary birth defects since before and after food fortification. It can be seen that there has been a reduction in reported offspring considered to have fortification.

Year	NTD rate (per 1000 live births)	Other primary birth defects rate (per 1000 live births)
2003-2004	1.88	1.88
2005-2006	1.88	1.88

The risk ratio between pre and post fortification is 1.0 (95% CI: 1.02 - 1.0). The pre fortification period shows an absence of 0 months for gestation.

The small shows NTD rates: pre and post fortification by province and combined.

Fig 1. The rate of NTD in South Africa before and after food fortification. The graph shows a slight decrease in the rate of NTD after fortification.

These results have been obtained since the submission of the draft. The final above treatment of health communication and surveillance.

**ARTICLE**

**Folate and iron status of South African non-pregnant rural women of childbearing age, before and after fortification of foods**

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 Department of Nutrition, North West University, North West Province  
 R. L. Mamasah, PhD, MSc

**Objective:** To assess the effect of fortification of staple foods on the iron and folate status of women of childbearing age.

**Design:** A prospective cohort study was conducted.

**Setting:** Thabameng Demographic Surveillance Site, a rural area in the Gaborone district of Limpopo Province.

**Subjects:** 110 non-pregnant women of childbearing age (15–44 years) (N=110).

**Outcome measures:** Serum ferritin, transferrin saturation (TSAT) and folate and total iron status.

**Results:** The prevalence of iron deficiency (ID) in the study population was 27.6% before fortification and 20.9% after fortification. Levels of folate were low (mean 1.2 µmol/L) and 1.0 µmol/L respectively in 2003 and 2004. The prevalence of iron deficiency (ID) was 27.6% before fortification and 20.9% after fortification. The prevalence of iron deficiency (ID) was 27.6% before fortification and 20.9% after fortification. The prevalence of iron deficiency (ID) was 27.6% before fortification and 20.9% after fortification.

**Conclusion:** This study shows a significant improvement in folate status in women of childbearing age after fortification of staple and animal products in South Africa, whereas the prevalence of iron deficiency (ID) was not significantly affected.

Plasma iron status will decrease and haemoglobin levels of the population will be lower, suggesting a decrease in iron status. This is due to the fact that iron status is a function of iron intake and iron loss. Iron intake is a function of iron intake and iron loss. Iron loss is a function of iron intake and iron loss. Iron intake is a function of iron intake and iron loss. Iron loss is a function of iron intake and iron loss.

## KEY RESULTS OF THE FORTIFICATION INITIATIVE

The wheat flour and maize meal fortification project in South Africa has been a success, reaching nearly 6 million women of reproductive age (15-49 years) and more than 2.3 million children under the age of six who are consuming fortified bread. Fortified maize meal is reaching as many as 9 million women of reproductive age and almost 3.5 million pre-school children.

A comprehensive micronutrient deficiency monitoring system does not currently exist, but early indications from the Birth Defects Surveillance System suggest a strong correlation between consumption of fortified foods and reductions in neural tube defects.

Additionally, findings from several surveys have demonstrated a strong consumer response and widespread public support for the fortification project. These results create strong political alliances that the NFA is able to leverage for the benefit of the Food Fortification Programme.

### Lessons learned

The success of this largely depends upon at least seven critical factors:

1. Compliance to the legislation by all millers (large and small).
2. Having a sufficient baseline survey done BEFORE implementation in order to accurately measure the impact of such a significant programme.
3. Fulfilment of the government's commitment to subsidise the milling industry's purchase of equipment; especially small millers.



4. Adequately trained and committed Environmental Health Practitioners tasked with monitoring millers' compliance.
5. The stability of the fortification mix.
6. Properly equipped and staffed laboratories.
7. Consumer awareness.

The three focal areas that will ensure the success and sustainability of the Food Fortification Programme are communications, marketing and support. Failure in any one of these will seriously jeopardise the longevity of the project.

### Communication

People must be widely informed about fortification so that they fully understand its benefits and actively seek fortified maize meal and bread. While the poorest of the poor may not feel empowered to approach sellers or manufacturers of their staple foods who are not fortifying, communication will hopefully give them reason to seek fortified foods.

Millers must also receive constant communication about fortification and the benefits increased nutrition will have on the productivity of their staff. There will have to be ongoing information that speaks to the heart and needs of the average small miller. That message most likely will not be the mere fact that it is the right thing to do or that it is against the law not to. Being as remote as many of these millers are, communication that reaches them must bring the message home.

### Marketing

Fortification must be popularly branded. Creating a brand that is acknowledged by the average South African is essential. The message may need to be broader so that South Africans who are doing well or move to urban areas can share information with their family members who remain in villages.

### Support

Small millers must have the government's support to finance equipment so that they are able to meet fortification requirements. Furthermore, technical terms and information should be communicated in layman's terms to ensure they fully understand their obligations and how to execute the fortification process.

## THE SOUTH AFRICAN FOOD FORTIFICATION PROGRAMME: “AN EVENING OF REFLECTION”



December 11, 2007

### UNICEF Representative, Mr Macharia Kamau: Talking Points

The UNICEF Representative for South Africa commended the National Minister of Health for her Ministry's leadership in steering the Food Fortification Programme for the past three years. He further extended congratulations to the National Food Fortification Alliance for their efforts in developing the original proposal submitted to GAIN in 2002. In particular, UNICEF acknowledged the role of the Department of Health as the key implementing agency and its ability to coordinate partners from both the private and public sector to assist in compiling the scientific evidence and implementation plans for the Food Fortification Programme.

- UNICEF has engaged in food fortification on the basis of the understanding that “adequate food is a basic human right”. Furthermore, this has been accentuated by the evidence that good nutrition is essential to achieve the aims of the Millennium Declaration, particularly the Millennium Development Goals 1 and 4, which focus on the eradication of extreme poverty and hunger and child survival respectively. Malnutrition is known to increase mortality in children. Therefore, we believe that fortifying staple foods such as maize meal and wheat flour contributes to the improvement of the nutritional status and the survival of vulnerable groups in society, particularly women and women.
- The reality: sub-Saharan Africa has the highest child mortality rates in the world, accounting for half of the 9.7 million children dying every year before the age of five. Given this situation, in September 2005 the AU commission developed a roadmap for reaching the Millennium Development Goal on Child Survival in Africa, as requested at the Summit of African Heads of State and Government, held earlier in July 2007, which specifically focused on accelerating child survival

and development in Africa. The Second Pan-African Forum on Children held in Cairo, Egypt in November this year reviewed progress made by member states and adopted a Call for Accelerated Action for Child Survival, Protection, Development and Participation as an expression of a renewed commitment towards creating an Africa fit for children.

- Today and tomorrow, a commemorative high level meeting is taking place in New York to review progress towards our collective commitment for a world fit for children. Overall, child mortality has decreased by 20% in developing countries and only 9% in sub-Saharan Africa from 1990 to 2006. Encouraging progress has been made in countries such as Eritrea, Madagascar, Malawi, Mozambique, Tanzania and Uganda.
- Together with WHO, the World Bank and other partners, UNICEF is supporting African countries to develop and implement national child survival roadmaps with the aim of accelerating action throughout the continent to give African children better chances of survival and development. The South African food fortification project is one of UNICEF's initiatives to improve the survival and development of children



in this country. Mr Kamau also acknowledged the exemplary nature of the public-private sector partnership that formed the core of the programme. Without the commitment of the milling sector to this programme we would not have succeeded. It is in particular pleasing to see the engagement of two key ministries in this programme, namely the Department of Health and the Department of Trade and Industry.

- UNICEF highlighted the promising documentation indicating that since the passing of mandatory regulations and the implementation of the Food Fortification Programme, there has been a 33% decline in neural tube defects. This is a significant contribution towards enhancing brain development and educability of South African children. We do however need to document other positive health impacts of this extensive programme over the coming years.
- In conclusion, UNICEF South Africa congratulated the government and people of South Africa for the commitment to this programme since its inception five years ago. Indeed in the true spirit of NEPAD and the AU, we know that lessons to be learned from this process and partnerships therein have already been expanded beyond the borders of South Africa to neighbouring countries as well as far afield as China, which is another recipient country of the GAIN funds. The importance



of ensuring that in future food fortification is not seen as a vertical programme but one that is integrated within the Infant and Young Child Feeding policy and within the ambit of improving overall nutritional status and optimal development of all vulnerable groups was emphasised.

- UNICEF's commitment to help strengthen the efforts to improve nutritional status and wellbeing of South African women and children was expressed and GAIN was thanked for entrusting UNICEF with the role of executing agency for this important programme.

### Speech by the Minister of Health, Dr Manto Tshabalala-Msimang

*Programme Director, Representatives of UNICEF, Global Alliance for Improved Nutrition (GAIN), Grain Millers, the Micronutrient Initiative, the Department of Trade and Industry, Researchers who were involved in the Fortification Programme, Honoured Guests, Ladies and Gentlemen:*



It is indeed a great pleasure for me to be here tonight to reflect on a subject that, as most of you would agree, is critical for the well-being of our nation.

You surely will agree with us as the Department of Health that nutrition is one of the most critical determinants of health and this is a point that we have sought to highlight in all of our health programmes. Food fortification is one of the very important programmes that form part of our efforts to deal with the nutritional challenges facing our country.

The Food Fortification Programme was developed through an extensive process of stakeholder consultation. There were preparatory studies done to ensure that our programme was going to be in line with international scientific requirements and addresses needs. The contribution of members of the National Fortification Alliance, especially the milling and baking industry, consumer organisations, professional food and nutrition associations and academics were very valuable in assisting the Department of Health in developing the Programme.

The South African National Food Fortification Programme was

launched in 2003, and it remains one of the most successful national food fortification programmes in the developing world.

The Department of Health is grateful for the ongoing support given to the Fortification Programme by the Global Alliance for Improved Nutrition (GAIN). This support assisted in ensuring sustainability of the programme. The United Nations Children's Fund (UNICEF) and the Micronutrient Initiative (MI) are also acknowledged for their unwavering support since the early stages of the programme.

Over the four years that the programme has been running, a number of lessons have been learned and indeed we are continuing to learn new lessons even today. Firstly allow me to remind you that our bread and maize meal are fortified with six vitamins and two minerals. Those are vitamin A, thiamine, riboflavin, niacin, pyridoxine, folic acid as well as iron and zinc. This has been regulated to ensure that all consumers benefit from the Fortification Programme.

The first commitment towards mandatory fortification we made as a country was the fortification of table salt with iodine in 1995. National surveys have since shown that more than 80% of women and 85% of children have adequate iodine levels as a result of this intervention. Almost 77% of households have access to adequately iodated salt (>15ppm). This is indicative of the fact that the country has the potential to deal with micronutrient deficiencies. The mandatory fortification of table salt has provided valuable lessons and laid a good foundation for the fortification of maize meal and wheat flour.

Programme Director, I am glad to state that as a country we are beginning to see the impact of the Fortification Programme. Evidence is emerging showing a significant reduction in neural tube defects that is attributable to food fortification. This, ladies and gentlemen, further illustrates the importance of documenting our experiences, analyzing and using data as it becomes available to show-case the impact of the programme.

As you surely would agree with us, monitoring of such a programme is fundamental in ensuring the improvement of the health of consumers and also ensuring compliance with the fortification regulations. The findings of compliance monitoring measures conducted thus far indicate that compliance still remains a challenge.

We are strengthening the capacity of Environmental Health Practitioners who are responsible for compliance monitoring, amongst many other duties. Furthermore, the laboratories responsible for testing the fortified food samples are also overburdened with other

testing responsibilities. Having identified these challenges, as government we are putting measures in place to address these constraints. To this effect, a memorandum of understanding has been developed with the SABS to monitor compliance and stability of the fortification mixes. Discussions are also under way to further improve the capacity for compliance monitoring by Environmental Health Practitioners. Providing assistance to the people who are doing the actual fortification, particularly small and emerging millers, is vital to the success of a programme of this kind. To that effect, Programme Director, ladies and gentlemen, a once-off subsidy grant of R23 million has been made available by government to assist millers to procure appropriate equipment.

The process to pay out the subsidy grant is at an advanced stage and should resume before the end of the 2007/08 financial year. We hope that the grant made available to millers will further strengthen their commitment to the programme for the benefit of all South Africans.

We are going to honour our commitment as government to assist millers to comply with fortification requirements. I hope that all millers will return the favour and assist in delivering much needed nutrients to our people.

The news about the fixing of bread prices in the country was very disturbing to us in the Department of Health. We chose bread as a vehicle for the provision of necessary micronutrients through the Fortification Programme because we understood that this was the most consumed product in the country.

Bread price fixing is therefore not just a bad business practice, but it undermines access to bread for the poor. In that way it deprives the very people who are highly affected by micronutrient deficiencies of access to fortified bread. This practice has to be strongly condemned and should never be allowed to happen again.

Programme Director, public education, awareness and communication have been and continue to be the central pillars of this programme. Through innovative and multimedia approaches, the public is made aware of the benefits of consuming fortified foods. The awareness and education activities are an integral aspect of our Healthy Lifestyle Campaign. I wish to appeal to members of the industry in general to work with us in ensuring the spreading of the health life style message.

We know that from our own experience and experiences of other developed and developing countries that food fortification would

make a major contribution in reducing micronutrient deficiencies in the country. It is for this reason that as government, and as South Africans, we remain committed in ensuring the sustainability of this programme by strengthening compliance monitoring and public awareness and communication.

In conclusion, I wish once more to thank all collaborating partners for working closely with us in advancing this programme and its intended outcomes. And to members of the industry, thank you for your support. This programme will not just benefit us as individuals, but it is of great benefit to our children and the future generations of this country.

Thank you very much.



**Address presented by Mr Larry Umunna, Regional Representative for Africa, Global Alliance for Improved Nutrition (GAIN), Geneva, Switzerland**

*The Honourable Minister of Health: Dr Manto Tshabalala-Msimang, MP; The Director-General, Department of Health: Mr T Mseleku; The UNICEF Country Representative: Mr Macharia Kamau; The Nutrition Advisor, NEPAD: Ms Bibi Giyose; Representatives of Development Agencies; Members of the National Fortification Alliance; Representatives of the Food Industry; Representatives of the Media; Distinguished Ladies and Gentlemen:*

Firstly, I would like to convey the best wishes of our Executive Director, Mr Marc van Ameringen, who is unable to join us for this auspicious event due to other engagements.

Mr Van Ameringen was very interested to fly down from our Headquarters in Geneva, Switzerland for this event. Unfortunately this event clashes with another equally important UN meeting in New York.

I am indeed very delighted at the privilege and honour to address this gathering. This event provides us with a unique opportunity to reflect on the South African Food Fortification Programme; achievements, lessons learnt and agree on the necessary steps required to ensure the sustainability of the programme. In the past three years, GAIN has truly enjoyed working with the Department of Health and other partners in ensuring the smooth implementation of the

Fortification Programme. It has indeed been three years of hard work, with lots of fun!

Since the establishment of the Global Alliance of Improved Nutrition (GAIN) in 2002, we have provided financial and technical assistance to developing countries in Africa, Asia and Latin America. With the active support of the Bill and Melinda Gates Foundation, USAID and CIDA, 19 projects in 17 different countries have benefited from our fortification programmes. Our vision is for all people, everywhere, to have the nutrition they need to lead healthy and productive lives. GAIN uses its experience and expertise to help establish innovative public-private investments to put nutritious, affordable foods on the market and reduce malnutrition. In Africa, GAIN is currently funding food fortification projects in Zambia, Uganda, Nigeria, Ghana, Cote d'Ivoire, Mali, Morocco and Egypt. There are plans to extend our funding to other countries within Africa in the next fiscal year.

While the best strategy for preventing vitamin and mineral deficiencies is ensuring that all people are consuming a balanced diet – this in practice is very difficult to achieve nearly anywhere in the world. Fortunately effective solutions do exist. Food fortification, the addition of small amounts of vitamins and minerals to the foods people consume regularly, is recognised by the international health community as one of the most efficient and cost-effective ways to



address the problems of micronutrient deficiencies. The history of food fortification dates back to the early 1930s when salt was first iodised in Switzerland. Between the 1950s and 1970s, foods such as margarine, milk, vegetable oil and wheat flour were fortified with micronutrients in Europe and north America. The fortification of sugar was launched in Zambia in 1999 (20 years after sugar was first fortified with vitamin A in Guatemala). Countries such as Zimbabwe (before the crisis) and Namibia fortified maize meal in the late 1990s. The west African countries of Nigeria, Ghana, Mali and Cote D'Ivoire are examples of countries with national fortification programmes. To underscore the importance of food fortification, the African Union Heads of State in December 2006 in Abuja adopted the AU-NEPAD Ten Year Strategy for the Reduction of Vitamin and Mineral Deficiencies; and implored for its implementation by 2008. It is worthy of note and highly commendable that South Africa launched its programme many years before the intervention of NEPAD and GAIN. This is testament to the commitment that South Africa has had towards addressing key nutrition priorities at achieving the UN Millennium Development Goals.

The role of business in the elimination of malnutrition is particularly important to GAIN. We recognise that the private sector, as the



engine of economic growth, has the capacity and capability to develop, produce, market and sell high quality, nutritious, fortified foods to consumers. Sustainability and effective distribution mechanisms are also critical success factors considered by the private sector in the delivery of foods to its consumers. There is a growing willingness of business leaders to contribute to the improvement in the nutritional status of the community in which they operate. The companies represented here today are forward-thinking business leaders who are making significant contributions towards improving the health of South Africans and should be commended for their efforts. The strong leadership provided by the South African Chamber of Milling should be emulated by other industry associations. We recognise the numerous challenges faced by the industry at the onset of the programme and initial concerns regarding issues of cost, monitoring and enforcement, etc. and trust that the Department will continue to engage with the industry with a view to finding practical and sustainable solutions to these challenges.

GAIN Business Alliance was established by GAIN and the World Bank in 2005 as a business forum to exchange ideas and experiences and to explore new ways to reach out to emerging markets with high-quality, affordable fortified foods. In 2006, the Africa Chapter was inaugurated in Johannesburg. GAIN looks forward to the active participation of the South African food industry in this global alliance. The establishment of a South African Chapter of the GAIN Business Alliance is one of our key priorities in 2008. It is expected that strong partnership projects in areas such as school nutrition, infant and young child nutrition and nutrition and HIV and AIDS could be developed based on a public-private partnership model.

GAIN also acknowledges the central role of governments in creating the regulatory and legislative environment that facilitates food fortification. It is its responsibility to monitor the impact of fortification programmes and ensure that health benefits are being delivered to the people who need it the most. The Department of Health should be congratulated for not only having the vision to launch the programme in 2003, but also for the strong role it played in keeping the alliance partners together and working towards successful implementation of the programme. The journey is not over yet! We have been assured that the Food Fortification Programme is one of the priority programmes of the Department, and all efforts are in place to ensure continuous fortification of sta-

ple foods, for the benefit of all South Africans, irrespective of their socio-economic status.

In January 2004, GAIN awarded the sum of US\$2.80 million to South Africa's National Fortification Programme; a public-private initiative to reduce micronutrient deficiencies amongst various populations in South Africa, especially women and children. Commercially produced wheat flour and maize meal were selected as food vehicles to deliver essential vitamins and minerals to the most vulnerable: women and children. With UNICEF South Africa as executing agency and the Department of Health as the main implementer, we are extremely delighted by the professional and efficient manner in which the grant was utilised and the activities implemented. The funds were used for four key areas that were identified for support:

1. Compliance monitoring and enforcement training (e.g. training of Environmental Health Practitioners).
2. Social marketing and communications (radio and TV campaigns used to communicate fortification messages to consumers all over the country).
3. Monitoring and evaluation (implementation of a national survey among children 1-9 years and women of child bearing age to determine their vitamin A, iron, folic acid and zinc status).
4. Programme management and administration.

The fact that over 90% of the wheat flour and between 70-85% of maize meal consumed in South Africa today is now fortified is one of the indicators of the success of the programme so far. We look forward to receiving the details of the outcome of the national survey conducted as part of this project. It is very likely that the results of this survey will highlight more measurable achievements of the project.

The South African Food Fortification Programme is the first GAIN-funded national fortification programme to be completed. The South African team should be very proud of their achievements.

There are lessons that can be learnt from the past three years of working in South Africa; lessons that will be beneficial to GAIN's programmes in other countries. Indeed, this is in line with the AU-NEPAD principles as embodied in the Ten Year Strategy document.

GAIN will continue to engage with the Department of Health with a view to identifying further areas of collaboration. Provision of technical assistance to specific components of the Fortification Programme (e.g. strengthening the capacity for monitoring and enforcement) could be considered. In early 2008, we shall intensify our discussions with the Department and various stakeholders around the support required for an effective development of a public-private partnership project for infant and young children between the ages of six and 24 months.

South Africa is a very strategic and important country for us. Africa (and indeed the rest of the world) look up to South Africa to provide relevant leadership to the continent in many endeavours. Early this year, we established the Africa regional office of GAIN in Midrand, Johannesburg. We are hosted by the Development Bank of Southern Africa, which was the In-Country project Advisor for this project at the inception of this programme.

Honourable Minister, distinguished guests, it is important to mention that GAIN's ability in achieving the goals of reaching up to two billion people globally with fortified foods is only possible through partnerships and key alliances that we have with many institutions and organisations. GAIN itself is an alliance that can only be successful when it can build on and use the strengths of many different institutions and committed people. I would therefore like to recognise the various partners that contributed immensely to the success of the programme:

- The Nutrition Directorate of the Department of Health under the strong leadership of Ms Lynn Moeng
- The Food Control Directorate of the Department of Health
- UNICEF
- The Micronutrient Initiative (MI)
- The National Chamber of Milling
- South African Chamber of Baking
- The Consumer Goods Council
- The South African Bureau of Standards (SABS)
- The Tshwane University of Technology

You can rest assured of GAIN's commitment and willingness to continue to work towards achieving a significant improvement in the nutritional and health status of the people of South Africa.

Thank you for your kind attention.



**Look out for this logo when you buy bread and  
maize meal in South Africa**