**MOROCCO’S NATIONAL FOOD FORTIFICATION PROGRAM**

_Eileen Brainne Sullivan, Robin Houston^1_

**Introduction:** The Government of Morocco has successfully implemented a national fortification program to increase the amount of fortified wheat flour and oil available in the market, which was supported by a US$2.92 million grant from the Global Alliance for Improved Nutrition (GAIN). Morocco was selected out of several countries that had submitted proposals to GAIN, to undertake fortification efforts in line with the government’s newly established program to fight micronutrient deficiencies launched in 2000.

**Objectives of Morocco Project:** The project’s objectives were to contribute toward the: (a) reduction of Iron Deficiency Anemia by one third from their 1995 levels; and (b) elimination of problems due to vitamins A and D deficiency. This would be achieved through the engagement of (i) 50 mills that would fortify a total of three million metric tons (MT) of flour with iron a year during the project period of three years; and (ii) three oil producers in the fortification of oil with vitamins A and D.

The activities were fully implemented within the project period, which is due to the unceasing efforts of the National Fortification Alliance (NFA), led by the Ministry of Health and with the collaboration of UNICEF as executing agency. Food fortification is an essential part of the Government’s strategy to improve health outcomes. The strategy was implemented by the active involvement of all stakeholders – public, private, universities, international and national agencies and NGOs – who are full partners in the NFA. The NFA was in charge of overseeing the development and implementation of the program to: a) develop the strategy for food fortification; b) coordinate the work of all partners to create synergies and ensure complementarity of all on-going activities; and c) monitor and evaluate all projects contributing to this strategy. The NFA is a viable institution that continues to work and bring its expertise to the field of micronutrients and nutrition.

Foods fortification for vulnerable populations has been accepted as a key intervention to address micronutrient deficiencies. The Copenhagen Consensus of 2008 ranked micronutrient supplements for children and micronutrient fortification as priority 1 and 3 respectively^2.

**Pre-program Situation:** At the start of the program, Iron Deficiency Anaemia (IDA) in Morocco was 32% among children less than 5 years old. Anaemia among women in childbearing age was 33%. Vitamin A Deficiency was 41% among children less than six years old. Iodine deficiency in the form of goitre was 22% among children between 6-12 years of age with only 41% of households using iodised salt. Vitamin D Deficiency was 2.5% among children presented with rickets.

Fortification and supplementation programs are priorities in the national developmental agenda, particularly since a 2003-2004 survey showed high rates of malnutrition (wasting: 9.3%; chronic malnutrition: 18%). In addition, the government has developed a four-year strategy to reduce maternal mortality from 227/100,000 to 50/100,000, and infant mortality from 47.4/1000 to 15/1000, which can only be achieved with sustained efforts at supplementation and fortification. Of note is the fact that iron deficiency anemia contributes to maternal mortality, and the project resulted in a 13% point reduction in IDA among pregnant women (45.5% of pregnant women were...

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2 For more on this, see website and link below: www.copenhagenconsensus.com/Default.aspx?ID=953.
3 Copenhagen Consensus 2008.

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diagnosed with iron deficiency in 1995 as opposed to 32.5% in 2008). There were also sensitive improvements in Vitamin A Deficiency, and continued data collection may reflect further improvements as fortified products reach a wider section of the population.

Fortification results could not have been met without the private sector: at the end of the project, 80 mills were fortifying flour, which translates to 63% of the national production being fortified; and five oil producers were fortifying oil with vitamins A and D out of the original three planned under the project, for a total national production of 79% (lower than in 2005 due to cost increases following the food crisis).

Key Lessons Learned: The project provides an excellent example of the strength and success of cooperative partnerships with a common goal in creating an enabling environment, in which the food industry can add critical ingredients to the foods they process to address known deficiencies in the population.

To build on the project’s results, future endeavours will need to focus on quality assurance as there is wide variability among the samples analyzed for flour and oil fortification. Sentinel site data needs to be collected over time to show trends in anaemia and other serologic measures, particularly serum retinol. Fortification levels will need to increase to capture the more vulnerable population that may not consume fortified flour, which will reduce the overall population impact, and make it more difficult to demonstrate an impact on anaemia.

Marketing campaigns will need to be maintained with an increased share of fortified flour in the market and increased communication and dissemination of the benefits of fortification to the wider population. Bakeries will need to be targeted as they form a large share of the consumption of bread and pastries, particularly in urban areas.

Initial improvements in serum folate levels are encouraging. Reinforcement and enforcement of the birth defects registry must be maintained to record Neural Tube Defects.

There is a need to better ‘triangulate’ data with additional information for production figures for both flour and oil. The Office National Interprofessionnel des Céréales et des Légumineuses has partnered with the Ministry of Health and the Alliance Nationale de Fortification since 2007, and provides official data received from the private sector on fortified flour.
Logos Used on Fortified Products:

« Siha Wa Salama »

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