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DSM supports African Governments in addressing malnutrition at scale

Key messages

The first thousand days, from conception to the second birthday, are critical for a child's physical and brain development. Malnutrition in expectant mothers, infants and young children leads to irreversible mental and physical stunting - acting as a brake on a person's development and a country's future productivity and growth.

Macronutrients (fats, proteins, and carbohydrates) support growth and body structure and fuel metabolism and body functions. Micronutrients (vitamins and minerals) are essential co-factors of energy metabolism and are required to support cellular structure and function. Without a supply of all these nutrients, growth falters. In poor communities, poverty and poor nutrition lock generations into a vicious circle of poor health, high child mortality rates and economic hardship. The nutrition a child receives in the first 1,000 days after conception effectively determines whether it is blessed or cursed for the remainder of its life, irrespective of any future healthy diet.

Chronic malnutrition or its manifestation, stunting, is a failure to achieve one's full potential for growth and brain development. It can be caused by lack of food, micronutrient deficiencies, impurities and infections, e.g. due to insufficient access to clean water to drink or poor sanitation. The prevention of stunting and other forms of under-nutrition, should start early in life, with interventions that ensure that pregnant and breastfeeding mothers are adequately nourished and have the necessary healthcare, that infants are exclusively breastfed during the first six months of life and that older infants and young children aged 7-24 months receive adequate complementary feeding in addition to breastfeeding.

Stunting of children is very high in many parts of sub-Saharan Africa and South-East Asian countries, and under-nutrition in the first 1000 Days is acknowledged as one of the key contributors. In Ethiopia, for example, 44 % of children under five are stunted, despite substantial progress in the last several years. The UN and the SUN (Scaling Up Nutrition) movement have recognized this scourge and more than 50 countries have now signed up for the SUN movement to implement nutrition improvement strategies.

Real progress has been made, and central to this has been the willingness of the development and aid community to draw on the private sector's expertise and products. The private sector has been recognized to be an indispensable part of the solution - especially in building grain processing, food manufacturing and distribution systems at the local level.¹

Solutions to nutritional challenges already exist and are available. DSM shares the United Nation's conviction that hunger can be eliminated in our lifetimes.² As the world's largest manufacturer of micronutrients, DSM has embarked on a number of successful partnerships that we think are models for broader efforts in the future. We have been developing and piloting affordable nutritious food solutions with the UN World Food Programme (WFP), our long-standing partner, and together with our humanitarian nutrition think tank Sight & Life we are often consulted by United Nations agencies, governments and NGOs to co-create or expedite key interventions in the developing world.

¹ Please see for example the recent EU policy paper setting out the role of the private sector at the forefront of international development: http://ec.europa.eu/europeaid/what/economic-support/private-sector/documents/psd-communication-2014_en.pdf

² <http://www.un.org/en/zerohunger/challenge.shtml>

DSM is now in a position to help further scale-up nutritional solutions, and we are happy to do so. The governments of Rwanda and Ethiopia, in close collaboration with the Clinton Health Access Initiative (CHAI), have invited DSM to co-invest with them in the manufacturing of affordable, nutritious and high-quality foods to improve the nutritional status of people in Rwanda and Ethiopia. This partnership was developed in cooperation with the World Bank (International Finance Corporation), CDC (the Development Finance Institution of the UK Government's Department for International Development) and FMO (the Dutch development bank) in close consultation with the Dutch government. Together, we will produce a highly nutritious micronutrient-rich porridge mix produced from soybeans and maize grown locally from Rwandan and Ethiopian farming cooperatives for children older than 6 months to complement breastfeeding. To promote agriculture and food production in Africa, the World Food Programme will be a major user of products from this food production facility. DSM is proud to be a partner in this multi-sectorial partnership and believes that by bringing together the strong commitment of the governments of Rwanda and Ethiopia and the specific know-how, skills and competencies of several recognized organizations we can help break the cycle of malnutrition and help ensure child survival and health.

Long-term consequences of a lack of adequate nutrition

Health in the earliest years, actually beginning with the future mother's health before she becomes pregnant, lays the groundwork for a lifetime of the child's well-being. Children will not grow at a healthy rate if adequate nutrition is lacking. Studies that have followed children from infancy through to adulthood show that the effects on growth and development in these vital years are irreversible. These individuals are at greater risk of stunting and underdevelopment. Severe vitamin A deficiencies increase child mortality, with current estimates suggesting that more than 157,000 child deaths under five occur each year as a result (Lancet 2013). This number has significantly declined in recent years due to the improved distribution of vitamin A capsules. Furthermore, zinc deficiency also affects children's physical growth and leads to increased susceptibility to a number of infections including diarrhea and pneumonia.

Both macro- and micro-nutrient deficiencies have insidious effects on neurological development. For example, iron is needed in the brain for the formation of certain chemicals (neurotransmitters) that are important for cognitive function. Iron deficiency thus impairs mental development in children. The prefrontal cortex is especially vulnerable to under-nutrition with the result that undernourished children can suffer from an inability to concentrate and reduced working memory.

Studies that have followed undernourished pre-school children find that they attain fewer grades of schooling and develop poorer cognitive skills such as those relating to problem-solving. In the long-term, the persistently malign effects of under-nutrition in early life have significant economic consequences in adulthood such as lower earning power and higher risk of non-communicable diseases such as diabetes, coronary heart disease, and high blood pressure. According to the Copenhagen Consensus, micronutrient supplementation and fortification provide the greatest returns on investment for the poor communities of the developing world.³ This means that combating malnutrition is not only a humanitarian imperative; it also yields enormous economic returns. Better nutrition can increase a nation's GDP by two to three percentage points. The Copenhagen Consensus calculated that every US dollar invested in nutrition today would yield a return of \$59.⁴

Recognized interventions to address stunting

Stunting can be caused by under-nutrition and frequent infections such as diarrhea, e.g. due to insufficient access to clean water to drink or sanitation.

³ http://repository.upenn.edu/cgi/viewcontent.cgi?article=1007&context=gcc_economic_returns
<http://jn.nutrition.org/content/early/2014/06/18/jn.114.191981.abstract>

⁴ <http://www.copenhagenconsensus.com/sites/default/files/hungerandmalnutrition.pdf>

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The prevention of chronic malnutrition or its manifestation, stunting, should start early in life, with interventions among at-risk populations that ensure that pregnant and breastfeeding mothers are adequately nourished and have the necessary healthcare, that infants are exclusively breast-fed during the first six months of life, and that older infants and children aged 7-24 months receive adequate complementary feeding in addition to breastfeeding.

The introduction of specially formulated foods, such as infant or PBM (Pregnant or Breastfeeding Mother) porridges is a recognized intervention to prevent under-nutrition. Infant and PBM porridges are a good source of macro-nutrients (proteins, fats and carbohydrates) and micro-nutrients (vitamins, minerals) and essential fatty acids. A home-fortification approach, where a small amount of a micro-nutrient powder (MNP) is added to home-prepared foods is another good intervention as long as people obtain sufficient macro-nutrients from the food they eat.⁵

DSM contributes to multi-sectorial nutrition solutions

DSM has a track record in addressing malnutrition and has emerged as one of the industry leaders in this area. DSM is often consulted by United Nations agencies, governments, academia and NGOs. Collaboration with government authorities includes, for example, the Dutch government: the commitment of the Dutch government has been instrumental in making the Amsterdam Initiative against Malnutrition (AIM) a success, a multi-stakeholder partnership which also includes, among others, Unilever, DSM, Akzo-Nobel, and Wageningen University.

DSM's public-private partnership with the United Nations World Food Programme (WFP), in place since 2007, has contributed to improving the diets of people by making technical and scientific nutrition expertise available with high-nutrient products and financial and in kind assistance to increase the nutrition-related knowledge base of WFP and improve the micronutrient content in WFP's food basket.⁶ DSM's Nutrition Improvement Program (NIP) aspires to develop and market effective nutrition solutions by leveraging our expertise and partnerships to reach the base of the pyramid and so positively impact public health.

DSM believes that companies, governments, academia, NGOs and international institutions must work together in finding innovative solutions and scaling up production. We are therefore engaged in a range of partnerships and alliances. In addition to the United Nations World Food Programme (WFP), this includes the Global Alliance for Improved Nutrition (GAIN), UNICEF, the US Agency for International Development (USAID), World Vision International, Vitamin Angels and, together with General Mills, Cargill and Buhler, the Partnership in Food Solutions.

Since 1986, DSM's humanitarian nutrition think tank *Sight and Life* has been championing the global fight against malnutrition by advancing science and building the evidence base for micronutrients, forming strategic partnerships with other organizations, as well as advocating for better nutrition and health for the world's most vulnerable populations.

DSM invited to assist the poorest families initially in Rwanda

DSM has been invited by the Government of Rwanda in close cooperation with the Clinton Health Access Initiative (CHAI) to support the Government of Rwanda in its far-reaching initiative to address malnutrition, particularly among the rural poor.⁷ Together with CHAI and our longstanding partner, the UN World Food Programme (WFP), we have developed innovative food solutions to improve maternal

⁵ http://www.sightandlife.org/fileadmin/data/Magazine/2013/27_2_2013/Commentary_The_Stunting_Enigma.pdf and http://www.sightandlife.org/fileadmin/data/Magazine/2013/27_2_2013/MNP_Supplement_to_27_2_2013.pdf

⁶ <http://www.wfp.org/partners/private-sector/meet-our-partners/dsm>

⁷ <http://scalingupnutrition.org/sun-countries/rwanda/progress-impact/implementing-aligning-programs>

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nutrition as well as complementary foods for older infants and young children with a good content of essential nutrients.⁸

The Rwandan Joint Venture comprised of the Government of Rwanda, DSM, CDC, FMO and IFC will produce variants of SUPER CEREAL *plus* porridge - a cereal-based food comprising a base of locally-sourced soybeans and maize together with micronutrients - for older infants and young children to grow and develop. A separate but similar cereal product will help Pregnant and Breastfeeding Mothers (PBMs) to be healthy. With the facilitation of CHAI, the Rwandan government is in the lead in developing the program, setting the specification for the composition of this variant of SUPER CEREAL *plus* product and organizing the distribution to the poorest families in Rwanda. Maize-based porridge is widely accepted and consumed by people in Rwanda.

This approach is inspired by solid evidence showing that the first 1000 Days, from conception to the second birthday of the child, are critical for a child's physical and mental development. The nutrition a child receives in the first 1000 days thus effectively determines whether it is blessed or cursed for the remainder of its life. DSM and all JV partners strongly support and follow the WHO recommendation that infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and long-term health. Thereafter, older infants and young children should receive nutritionally adequate and safe complementary foods, while continuing to breastfeed for up to two years or more.⁹ The Rwandan Government has implemented and will continue an extensive breastfeeding education effort. Rwanda has one of the highest breastfeeding rates in sub-Saharan Africa.¹⁰

The Rwandan government is an equity holder in the Joint Venture, together with DSM, CDC, FMO and the World Bank's International Finance Corporation (IFC). The Joint Venture will construct a food production facility close to Kigali. In order to guarantee long-term viability of the project the Joint Venture will market a small proportion of the product as a branded product to food retailers in East Africa. We believe that marketing to East-African retailers will help the Joint Venture to ensure that this important nutrition initiative can be implemented to best effect and thus reach a greater number of families.

The Joint Venture will be sourcing soybeans and maize locally from a dozen Rwandan farming cooperatives, acting as guarantors for a proportion of the farmers' annual production. The Rwandan government will distribute the product at no cost to the most vulnerable populations. All in all, this will help to ensure food and nutrition security and be a major boost to Rwandan agriculture. The World Food Programme (WFP) has pledged to purchase the cereal product porridge and will also address chronic malnourishment among populations at risk in humanitarian relief efforts in other countries. WFP will export 80-90% out of the country, thus contributing to the government of Rwanda's objective of promoting sustainably increased returns to farmers from key export-driven agricultural value chains.

We are proud to be a partner in this multi-sectorial partnership and believe that by bringing together the strong commitment of the government of Rwanda and the specific know-how, skills and competencies of several recognized organizations we can break the cycle of malnutrition and ensure child survival and health.

This approach is envisioned to be mirrored in Ethiopia. The Ethiopian JV will include the Government of Ethiopia as an equity holder.

⁸ As established by CODEX Guidelines on formulated complementary foods for older infants and young children, 2013

⁹ As outlined by UNICEF: <http://www.unicef.org/programme/breastfeeding/food.htm>

¹⁰ UNICEF:

http://data.unicef.org/corecode/uploads/document6/uploaded_pdfs/corecode/NutritionReport_April2013_Final_29.pdf