

## 11

# Introducing new and improved food products for better nutrition

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## 1. Introduction

To achieve the Millennium Development Goals, undernutrition must be addressed urgently and effectively. The development of ready-to-use therapeutic foods (RUTFs) has revolutionized the treatment of severe acute malnutrition/severe wasting and catalysed the development of other food-based commodities for treating and preventing less severe and other forms of undernutrition (Ciliberto *et al.*, 2005; Collins *et al.*, 2006; De Pee and Bloem, 2009).

WFP has already focused on ensuring that energy and protein needs are met and has stepped up the micronutrient fortification of processed commodities, such as cooking oil, flour and salt. The latest developments under its Nutrition Improvement Approach are directed towards meeting the nutritional needs of specific target groups (De Pee *et al.*, 2008b). These include children under 2 years of age, moderately malnourished individuals, pregnant and lactating women, populations suffering from micronutrient deficiencies, and the chronically ill – people living with HIV/AIDS and tuberculosis (TB). Meeting their nutritional needs is important for their survival, as well as for development. For ensuring survival, it is most important to treat or prevent micronutrient deficiencies. Among children under 5, vitamin A and zinc deficiencies are responsible for 0.6 million and 0.4 million deaths, respectively, every year (Black, *et al.*, 2008). To prevent or treat the different forms of undernutrition among different groups effectively, it is important that the underlying causes and consequences of undernutrition are understood, appropriate food-based

commodities are selected, and realistic and effective programme options are developed.

The focus on addressing the nutritional needs of specific target groups, and the concurrent increase in availability of specially formulated foods put WFP into a better position for saving more lives and improving the growth, development, health and future well-being of its beneficiaries. This is also of utmost importance to WFP in achieving its Strategic Objectives (SOs), such as SO1 saving lives and protecting livelihoods in emergencies, SO3 restoring and rebuilding lives and livelihoods in post-conflict, post-disaster or transition situations, and SO4 reducing chronic hunger and undernutrition.

This chapter describes the many lessons that WFP has already learned during the process of introducing new commodities in support of the Nutrition Improvement Approach, and identifies strategies to be pursued for providing better nutrition at scale to its beneficiaries and other groups of the population not directly serviced by WFP.

## **2. Improved nutrition for children under 2 is highest priority**

Early undernutrition leads to reduced physical and mental development during young childhood, which subsequently affects school performance and attendance. Undernourished children are more likely to start school later and drop out earlier. The devastating impact on their early development and school performance adversely affects their income-earning potential for life, making it very difficult to rise out of poverty (Victora *et al.*, 2008). In addition, undernourished children who put on weight rapidly at later stages of childhood and adolescence are more likely to develop nutrition-related chronic diseases, such as diabetes, hypertension and coronary heart disease (Black *et al.*, 2008). The long-term damage caused by early childhood undernutrition includes shorter adult height, lower productivity, and low birth weight for babies born to women who were undernourished girls, which perpetuates the problem in the next generation.

Research among men aged 25 to 42 years in Guatemala found that those who received a nutritious supplement when they were 0 to 2 years of age earned higher hourly wages – by an average of 46 percent – than men who did not receive the supplement (Hoddinott, 2008). This indicates that investment in early childhood nutrition can drive economic growth for individuals and societies.

Much of the damage caused by early childhood undernutrition is irreversible, especially when the child's circumstances and diet remain largely the same while he/she grows up. Bones and tissues such as muscles grow very

quickly during certain periods, particularly the first two years of life and during adolescence. When growth during these periods is limited by a shortage of the essential nutrients required for the formation of new tissues, shorter height will result, unless the diet is drastically improved. For the brain to develop well, it also needs nutrients and stimulation at an early age. When nutrients are lacking and the child is constantly tired owing to anaemia or illness, the response to stimulation is reduced and overall development hampered. Much remains to be learned about the exact physiological processes of growth, immunity, transmission of stimuli in the brain, etc., but there is increasing evidence that damage brought about by early childhood undernutrition – including during foetal life – is largely irreversible. The period between conception and 2 years of age, or from -9 to 24 months, is therefore known as the “window of opportunity”; this is the period when good nutrition is particularly important and a lack of the right nutrition will have lifelong consequences.

The prevention of maternal and child undernutrition is a long-term investment that will benefit the present generation and its children. It is very important to focus interventions on the prevention of stunting/short stature and micronutrient deficiencies, and the prevention and treatment of wasting/recent weight loss. It is also necessary to provide nutritional support to pregnant women, to ensure adequate nutrition for their unborn children and to reduce the risks of mothers giving birth to underweight or mentally impaired babies or dying during childbirth. Mothers also need nutritional support so they can feed and care for their children adequately, through exclusive breastfeeding for the first 6 months of life, followed by appropriate complementary feeding.

Based on these findings, WFP is giving priority to improving the nutritional value of its commodities in order to deliver the right nutrition at the right time in people’s lives, particularly for young children. This means introducing new and modified commodities, delivering specific commodities to specific target groups, and developing new programming that reaches specific target groups with special commodities and information.

## **2.1 Why is chronic malnutrition relevant in emergencies?**

Wasting, or low weight-for-height, is also known as acute malnutrition; stunting, or short height-for-age, is also known as chronic malnutrition. The terms “acute” and “chronic” are somewhat misleading, however, as both chronic and acute malnutrition develop in relatively short periods.

Wasting usually has a sudden onset and is mostly due to a combination of sudden food shortage and disease. Severe wasting should be addressed immediately, as it has a very high mortality rate; moderate wasting should be treated so that it does not worsen. Stunting develops before the age of 2 years

and, as explained in the previous section, should be prevented before requiring treatment because it is very difficult to correct without major dietary and environmental changes and is associated with other nutrient deficiencies and related developmental delays and shortcomings, many of which cannot be corrected later in life. This means that a short-term intervention between conception and 2 years of age can prevent chronic malnutrition, which would otherwise affect a child for the rest of her/his life.

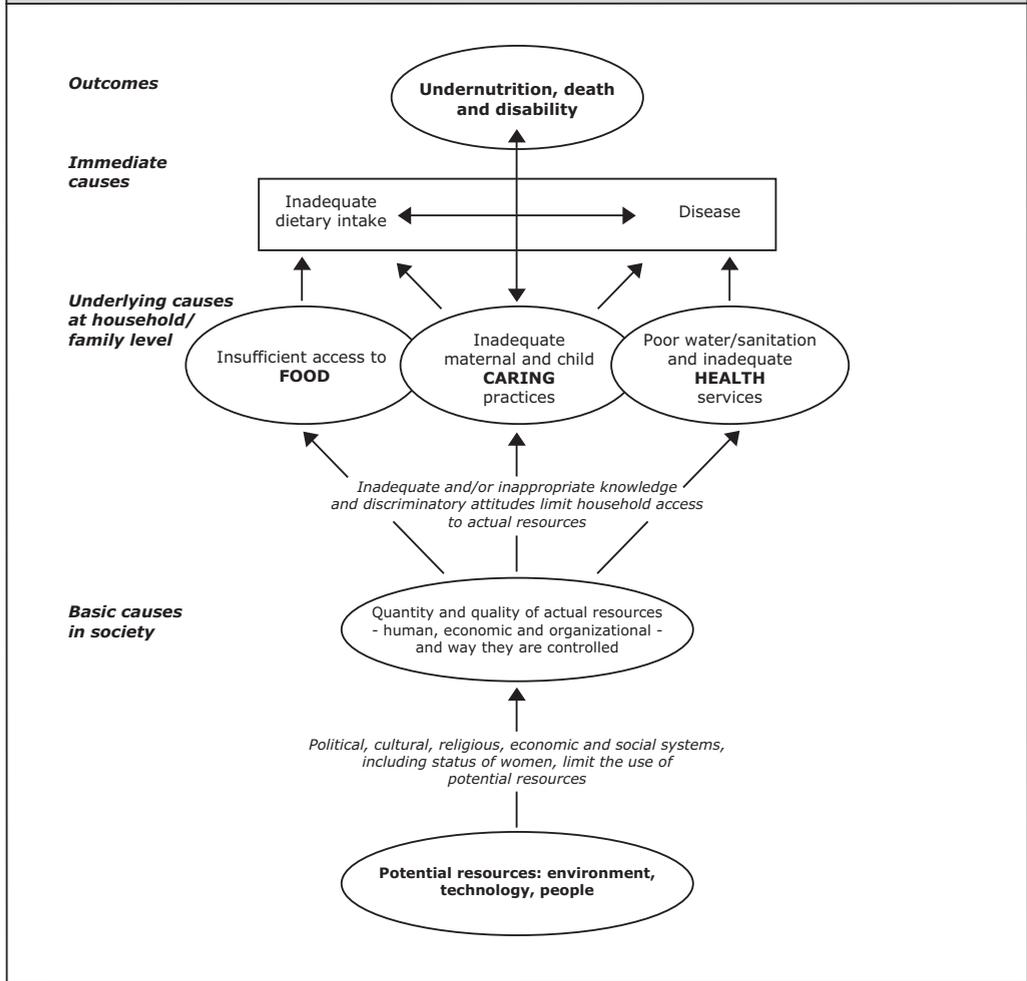
In other words, any intervention lasting for one or two years – whether it is an emergency operation, a protracted relief and rehabilitation operation or another kind of programme – can implement short-term actions for long-term impacts through providing the right nutrients to the youngest children.

## **2.2 Better foods versus other factors with an impact on nutrition status**

The United Nations Children’s Fund (UNICEF) conceptual framework of the direct, underlying and basic causes of malnutrition shows that in addition to nutrient intake or consumption of special foods, many other factors are also important for nutrition status (Figure 11.1). These include clean water, hygiene, good caring practices, maternal education and economic development and stability. So why is making better foods available regarded as being so important?

To develop a good understanding of how nutrition status can be improved, the immediate causes should be distinguished from the underlying and basic causes. The immediate causes of child malnutrition are dietary intake and disease. Especially for stunting, dietary intake of appropriate nutrients is of utmost importance, because without it a child’s body will not build enough of the bones and muscles required for gaining height, not develop a well-functioning immune system, and cognitive development will also be reduced. This requires very diverse nutrients, including essential amino acids, macrominerals – calcium, phosphorus, magnesium, etc. – and micronutrients/vitamins and minerals. As a rule of thumb, a diet consisting largely of plant-source foods, such as staples, vegetables and fruits, and virtually no animal-source foods, such as milk products, fish, meat and eggs, or fortified foods does not provide all the nutrients required for a young child’s growth, health and development.

**Figure 11.1 UNICEF conceptual framework for the causes of undernutrition**



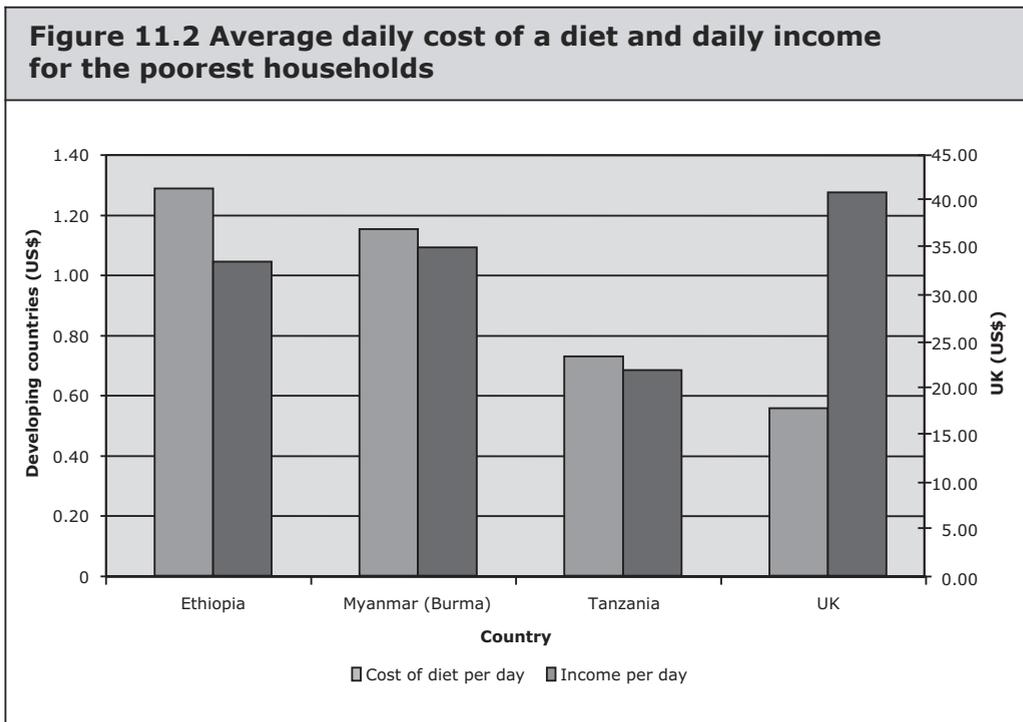
Source: UNICEF, 1998.

Thus, a high prevalence of stunting and micronutrient deficiencies indicates that young children are not receiving all the nutrients they require from their diet. Diseases further reduce the chances of meeting nutrient requirements because they increase nutrient needs, lead to reduced food intake owing to poor appetite, and increase nutrient losses. However, it is important to realize that even in the absence of disease, children with inadequate nutrient intake will not grow adequately and will thus become stunted (Golden, 2009).

An inadequate nutrient intake can have multiple causes, including being unable to afford a variety of foods in the family diet beyond staples, i.e., poverty;

lacking access to a good variety of foods, because they are not produced or are not available in markets or shops; or lacking knowledge and having inappropriate child care practices and/or food taboos. It is very important to understand these causes when planning the most appropriate interventions. For example, where people can make choices because they have access to nutritious foods – i.e., the foods are available and affordable – nutrition education may be required. However, knowing which choices to make will not make much difference to people who are food-insecure because of poverty or poor harvests, as they cannot afford these choices.

The cost of the diet assessments by Save the Children UK show that incapacity to afford an adequately nutritious diet can affect many households in a population (Chastre *et al.*, 2007). For example, Figure 11.2 compares the costs of a nutritious diet with the income available to the poorest households in Ethiopia, Myanmar, the United Republic of Tanzania and the United Kingdom. In all the countries except the United Kingdom, the total available income of the poorest households is clearly not enough to afford a nutritious diet, especially given that not all income is spent on food – the poorest households typically spend 70 to 80 percent on food (Chastre *et al.*, 2007).



Source: Save the Children UK, 2007.

In areas where food insecurity is prevalent, children will certainly not meet their nutrient requirements for adequate growth, health and development, because this requires adding high-quality nutritious foods to the diet, which is impossible in food-insecure households.

Thus, although interventions to reduce disease, nutrition education about good food choices, universal access to education, etc. are very important, they cannot reduce child undernutrition significantly unless they enable or are accompanied by access to and consumption of nutritious foods. Currently, many actors, including the private sector, focus on developing and making nutritious foods available to people with limited access to appropriate foods for meeting the nutrient requirements of their children.

### **3. What changes is WFP making to its food basket?**

Improving the quality and diversity of food products used in WFP programmes is critical. WFP is working, swiftly and determinedly, with partners in the private sector, universities, United Nations agencies and non-governmental organizations (NGOs) to develop new products and delivery modalities as part of a toolbox of strategies for treating and preventing different types of malnutrition, including micronutrient –vitamin and mineral – deficiencies. WFP and its partners are also working to develop and assess the effectiveness of innovative products for the prevention and treatment of malnutrition.

Foods should provide the nutrients required to prevent or recover from undernutrition for each target group. For example, foods provided to children suffering from moderate acute malnutrition should provide the nutrients required for the growth of muscle, bone and fat mass, energy for physical activity, and adequate vitamins and minerals to allow good health and development.

For the past 30 years, fortified blended foods (FBFs) have been provided to any group with high nutrition needs, such as moderately malnourished individuals and pregnant and lactating women, and as a good source of micronutrients to the general population. The rationale for this is the foods' contents: good-quality protein, mostly from soy, carbohydrates from wheat or maize, and a vitamin and mineral premix added during production. In addition, FBFs are affordable, with prices that are not much higher than those of other commodities in the food basket.

However, selecting the right mix of foods to promote good growth and development is a complex task, because one food, such as soya, cannot easily replace another food, such as milk. It is increasingly understood that foods do not contain only nutrients, such as protein, vitamins and minerals, but also anti-nutrients, such as phytate, polyphenols and enzyme inhibitors.

Foods with comparable protein profiles, such as soy and milk, may therefore have very different growth and health promoting properties, owing to their different anti-nutrient contents. Anti-nutrients have negative impacts on digestion and the utilization of foods consumed. For example, soybeans contain phytate and fibre, which reduce the absorption of the minerals iron and zinc and increase the bulkiness of the food, so that young children consume less energy for the same volume. Milk does not contain these anti-nutrients, and is also thought to contain growth promoting factors.

Because food composition tables do not list most anti-nutrients and active compounds, it is difficult to draw conclusions about the potential nutritional impact of a product made from a variety of ingredients without detailed knowledge about these ingredients and testing of the end-product in the target group.

The commodities and programme modalities used by WFP to prevent and treat undernutrition, including micronutrient deficiencies, are being revised as follows:

- *Enhancing the quality of the home diet for young children by adding complementary food supplements, particularly as lipid-based nutrient supplements (LNS) or micronutrient powders (MNPs)*: Home fortification refers to the addition of a small complement to the meal or diet in the form of a powder or spread that contains specific nutrients of which the home-based diet typically has too little (Dewey, Yang and Boy, 2009; Zlotkin *et al.*, 2005; De Pee *et al.*, 2008a; Adu-Afarwuah *et al.*, 2007; 2008; Defourny *et al.*, 2009). Examples include the micronutrient powders MixMe™ or Sprinkles™, and small amounts of spread, such as 45 g/day of Plumpy Doz™, 20 g/day of Nutributter™, or 50 g/day of RUFIC India/Pakistan (see below). In addition to micronutrients, the spreads or LNS also contain milk powder, essential fatty acids, essential amino acids and macro-minerals such as calcium and magnesium.
- *Improving FBFs such as corn-soya blend (CSB) and wheat-soya blend (WSB)*: From January 2010, all FBFs should use a new vitamin and mineral premix with larger amounts and improved forms of vitamins and minerals, known as CSB+. In addition, CSB++ has been developed for consumption by young and malnourished children. It consists of 57 to 62 percent maize, 15 to 20 percent dehulled soya, 9 percent sugar, 8 percent milk powder and 3 percent soybean oil, and uses the same micronutrient premix as CSB+, with reduced permissible levels of aflatoxin and microbiological contamination.
- *Using ready-to-use foods (RUFs) for treating moderate malnutrition*: Following the success of RUTFs such as Plumpy Nut™ in treating severe acute malnutrition, products with very similar properties are being developed for treating moderate malnutrition/moderate wasting, such as Supplementary

- Plumpy™ at 92 g/day, and RUFIC India/Pakistan at 100 g/day.
- *Developing and testing RUFs, especially spreads, for treating moderate malnutrition among under-5s, providing about 500 kcal/day, and for blanket preventive use among under-2s, providing up to 250 kcal/day or 50 g/day:* For example, a chickpea paste being developed in India and Pakistan, and known as RUFIC India/Pakistan, is comparable to the LNS currently on the market, such as Supplementary Plumpy™ and Plumpy Doz™, but uses additional, local ingredients. The impact of these new RUFs has still to be tested.
  - *Increasing food fortification for the general population through the fortification of staples – wheat and maize flours, rice is still experimental – cooking oil and condiments, salt:* All flours distributed by WFP need to be fortified, but many cereals are still distributed as whole grains. Since the World Health Organization (WHO) published new guidance on food fortification (Allen *et al.*, 2006), WFP has supported introduction of the recommended fortification practices. Fortification of staples is a very cost-effective way of improving the general population's intake of vitamins and minerals, but can never meet the greater needs of young children, pregnant and lactating women or people living with HIV and AIDS, because these groups do not consume large enough amounts of these foods, which are fortified at levels that meet requirements of the average person in the population.

Table 11.1 in the annex to this chapter describes each of these categories, their intended target groups and options for their use, and provides information on the locations and scale at which WFP has started to introduce these commodities.

The availability of different options means that choices have to be made, such as between providing an RUF or an enhanced FBF to moderately malnourished children, or between improving the diet of young children with an MNP or a spread. Programmes may also have to be changed when foods are to be provided to groups that were not previously targeted with a specific product. For example, in a situation of high food insecurity and high prevalence of child malnutrition, it might be considered essential to provide a special product to under-2s, to prevent increased malnutrition rates. Sometimes this is only a temporary measure, usually during the lean season. Information should be provided about the what, why and how of a product introduced for such purposes. In addition, although this preventive approach has been shown to be cost-effective, it requires additional funding, which may not always be easily accessible.

**Figure 11.3 Nutritional products used by WFP**



From top-left: micronutrient powder (sprinkles), high energy biscuits, Plumpy Doz™, Supplementary Plumpy™, date-bars, and the key components of the WFP food basket.

Source: WFP website: [www.wfp.org/photos/gallery/nutritional-products-used-wfp](http://www.wfp.org/photos/gallery/nutritional-products-used-wfp).

The following section describes some of WFP's experiences with these aspects as it introduces the new commodities.

#### **4. Experience with the introduction of new commodities**

Before new or improved commodities are introduced, certain conditions need to be in place: first, WFP, its government and other partners, including donors, must all understand and agree that the changes are necessary; second, specific commodities have to be selected, and must be available in time, either locally or through import; and third, the partners selected to implement the programme must be able to provide information about the products – what they are, whom they are for, etc. – and this may require the design of a social marketing campaign, etc.

The following sections describe the issues encountered when new commodities are introduced into WFP operations, and outline ways forward.

##### **4.1 Introducing MNP into a community: the importance of package design and social marketing**

MNP for home-fortification usually comes in small sachets containing 1 g of powder to be mixed with one meal, once a day or once every two days. Because both the product and the practice of fortifying a meal just before consumption are new to most beneficiaries and programme staff, the MNP needs careful introduction and presentation. This includes effective packaging of the sachets and their box, which are the main routes of communication with beneficiaries, and a social marketing and awareness raising campaign. Traditionally, WFP has distributed foods that are well known to beneficiaries. A powder in a sachet is very unfamiliar, and such products are not yet available on local markets. Through its partnership with DSM,<sup>1</sup> WFP has started distributing MNPs in Kenya, Nepal and Bangladesh, and has learned many lessons.

For quick production of the MNP, printed foil for the sachets should ideally be ready in the factory. Except where the product is already produced locally, this means that the same sachet should be acceptable across different countries. Preferences are very locally specific, so WFP uses a pictogram of the sachet's contents being emptied on to a generic bowl of food (Figure 11.4). Clear guidelines have been drawn up for the design of boxes, including the information they must provide, because boxes have to be designed locally in the appropriate language and with appropriate images of target group(s), declaration of ingredients, and instructions for use, storage, etc.

The social marketing and awareness raising campaign should tie into existing nutrition and health promotion activities and programmes and use actors who are

trusted by the community. This is particularly important for avoiding rumours, such as the misconception that the white powder distributed in a package illustrating a happy child, mother and father is meant for family planning.

**Figure 11.4 Universal sachet design for micronutrient powder (MNP)**



Extra micronutrients are needed by many people, particularly young children, and not just the beneficiaries of WFP, government or other programmes; in many cases families could afford a micronutrient product if it was available on the local market. Availability on the local market would also allow WFP and others serving the poorest of the poor to purchase the product and benefit from its being known to the population. A subsequent step in a nutrition programme should therefore be to use a public-private partnership to make an MNP or similar product available for sale at the same time as it is distributed free of charge. When beneficiaries obtain the product by using a voucher – which they receive for participating in a food-for-asset programme, for example – the same outlets could be used by both groups of customers, and marketing efforts could be combined.

The experience of designing MNP packaging may also be relevant to other new products that are developed for specific target groups and that therefore need good communication about appropriate use, preparation, etc.

**Important lesson learned:** Marketing expertise is essential when designing and distributing a new and unknown type of product, such as MNP, to consumers.

#### **4.2 New and specialized foods, limited market, limited production**

Although many of the world's children require one or more specialized foods for preventing or treating undernutrition – 179 million children under 5 are stunted, and 19 million suffer from severe acute malnutrition – the products are new and are being produced in only a few facilities, suggesting that demand is far greater than availability. However, there is also a great desire to use local foods as much as possible when dealing with undernutrition. This can range from using nutrition education to explain which foods are best, to producing a special food industrially from a selection of locally available foods, preferably enhanced through fortification.

Nutrition education has a long history, but as discussed earlier, it only works when people can exercise choice, and even then the needs for particular nutrients are so high during certain periods of development that it is very difficult to meet them without at least some fortification, such as an MNP. In addition, with local production, a company has to be able to profit from its investments in research and development, and must have the capacity to produce the specialized food. Currently, very few companies are producing lipid-based RUFs; although production is not particularly high-tech, companies need a guaranteed demand before they decide to produce these products.

For WFP, this means that local acceptance of a new or improved product and the possibility of importing it are essential; the required quantity must also be available in time. To increase the availability of suitable products while using local ingredients as much as possible, WFP is involved in the development of a chickpea-based spread in India and Pakistan, and in date-bar fortification in the Middle East. Meanwhile, UNICEF is working with producers to increase the production capacity for existing, ready-for-production, lipid-based RUFs.

**Important lesson learned:** Development and international acceptance of a new specialized food product do not guarantee its availability locally.

### **4.3 Product development requires a range of expertise and a pilot production facility**

To develop new foods, such as the chickpea paste in India and Pakistan, WFP requires a range of expertise, including in nutrition, food technology, packaging, legislation and marketing – the typical areas of expertise for food companies. A small pilot production facility is also needed, for producing test batches of new product to fine-tune the proportions of ingredients and the processing steps and to examine the product's properties.

WFP has very limited expertise in these areas, especially in food technology and packaging, and no facility for producing test batches. The few experts in WFP therefore liaise with local and international companies for product development, on condition that the specifications of any product developed should be made publicly available. This means that any company that can meet these specifications can bid when WFP issues an invitation to tender for production. This experience illustrates how the lack of guaranteed demand from purchasing agencies hampers efforts to increase the availability of suitable new specialized food products.

***Important lesson learned:*** Public-private partnerships are needed to pioneer ways of working together on the development of new food products.

### **4.4 Enhanced FBFs such as CSB++ have superior nutrition properties, but few production facilities**

WFP purchases more than 300,000 mt of CSB every year, more than 60,000 mt of which is for children under 2 years or moderately malnourished children. Both groups should now receive CSB++ instead of CSB (Table 11.1, annex), or a ready-to-use food, and facilities for producing CSB++ should be identified.

The specifications for CSB++ are tighter than those for CSB+ in terms of microbiological contamination and aflatoxin content; dehulled soybeans should be used; oil and milk are added during the production process; and the product is packaged in smaller bags, of 3–7 kg instead of 25 kg, so they do not have to be opened and split into smaller quantities at distribution points. As a result, almost all CSB++ producers outside Europe – WFP purchases about 60 percent of CSB in developing countries – have to modify their production facilities and processes, which requires substantial investments that producers cannot yet realize. Specific technological assistance, longer-term agreements with producers to guarantee purchase of a specific quantity for a set period, investment support, etc. are required to enable these facilities to produce CSB++ for WFP and UNICEF.

**Important lesson learned:** The substantial adjustments to production processes, including strict application of good manufacturing practices and principles of hygiene, required to produce CSB++, are hindering a rapid increase in production capacity.

#### **4.5 Should each new specialized food product be tested for impact before use?**

Because new specialized foods are developed for the specific purpose of preventing or treating undernutrition, including micronutrient deficiencies, their impacts on nutrition outcomes should be known. However, impact studies take at least one to two years to carry out, following six to 12 months of designing and acquiring ethical approval and funding for the study.

The question now is whether newly developed foods that are accepted by the targeted community can or cannot be used in programmes while their impact is still being studied. In principle, the best foods available should be provided, which for moderate malnutrition are LNS such as Supplementary Plumpy. However, these foods are new, and available only at limited scale; the fall-back food is CSB+,<sup>2</sup> but CSB++ has a better composition for treating moderate malnutrition than CSB+ – owing to its additional milk powder, sugar and oil, use of dehulled soybeans, and stricter limits for aflatoxin and microbiological contamination – so it should replace CSB+ where LNS provision is impossible. The impacts of CSB++ compared with those of LNS products and CSB+ are being tested, to find out whether it requires further modifications. The same applies to the chickpea-based RUF developed in India, and to its use and the use of CSB++ in blanket feeding to prevent malnutrition among children aged 6 to 24 months.

This twin-track approach of using a new product while it is being tested, if it is expected to perform better than the product it replaces, is in-line with an agreement reached at the WHO/WFP/UNICEF/UNHCR informal technical consultation on the treatment of moderate malnutrition in October 2008 (Shoham and Duffield, 2009).

**Important conclusion:** Specialized products have special purposes and their impacts on the desired outcome should be tested in well-designed studies. However, while these studies are being conducted, the products can be used in programmes, provided that they are acceptable to the target population and are expected to perform better than the products they replace.

#### **4.6 Collaboration with the private sector**

The new specialized foods are processed products, and most of them are produced by the private sector. Because the products are new and not yet widely available on the market, packaging has to be adjusted to programme and local needs, and WFP has to link its logistics to those of the manufacturer; good collaboration between public and private sector partners is essential.

Every company has its own corporate culture, ways of working, targets, etc., and companies do not all follow the same approach to partnerships with the public sector, whose agencies also operate in very diverse ways.

WFP is involved in a number of public-private partnerships aimed at providing it with access to specific expertise and products in a wide range of areas, including logistics, micronutrients, school feeding and food technology. For the companies, working with WFP enables them to support the poorest of the poor, increases their understanding of the issues faced by this group and by WFP, and involves them in interaction and experience that should lead to new ideas and initiatives focused on low-to-middle income population segments. These groups also need the new specialized products, but are not typically targeted by WFP or other programmes, and would be able to afford some of them. At the moment however, such products are often directed to higher-income segments of populations and may be imported in fancy packaging.

***Important lesson learned:*** Public-private partnerships are needed to increase the availability of nutritious products for both the poorest of the poor and low- to middle-income consumers; individual partners must collaborate to make things work.

#### **4.7 Utilization of new products: are nutrient requirements being met?**

The new products have been developed to meet nutrient requirements more effectively. Their use should therefore be monitored to ascertain whether their distribution results in the desired nutrient intake. Because certain commodities are meant for consumption by only specific family members – blanket feeding of children under 2, supplementary feeding for the moderately malnourished, the chronically ill or pregnant and lactating women, etc. – it is important to determine whether or not they are actually reaching these individuals. The acceptance, preparation and consumption of new commodities, as well as the overall diet of the individual, therefore needs to be monitored.

***Important conclusion:*** Monitoring of the actual use and consumption of distributed commodities by individual household members is required.

## 5. Conclusions

WFP's toolbox already includes the fortification of staples and condiments, and the production of FBFs such as CSB. WFP is now developing, improving and adding food commodities to the food basket to meet more effectively the nutrition needs of specific target groups: young children, moderately malnourished children, pregnant and lactating women, people living with HIV/AIDS or TB.

The toolbox also includes new strategies, such as home-fortification with MNPs (MixMe™ or Sprinkles™) to address micronutrient deficiencies, ready-to-use supplementary foods (RUSFs) for treating children with moderate acute malnutrition, and food supplements to complement the diets of young children aged 6 to 23 months, to prevent malnutrition.

WFP uses a twin-track approach to the development and use of new or modified foods for young children. New foods are developed in line with current scientific knowledge and hypotheses regarding the treatment or prevention of different kinds of malnutrition. These foods are distributed in selected operations in place of foods of less adequate nutritional composition. At the same time, the impacts of the products on growth – weight as well as length or height – morbidity and micronutrient status are being tested, which could lead to further improvements of products as well as their production and delivery.

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<sup>1</sup> DSM is a global life and materials sciences company producing innovative nutrition, speciality food and pharmaceutical products, performance materials and industrial chemicals; WFP's collaboration with DSM focuses on nutritional quality, particularly micronutrients.

<sup>2</sup> From January 2010, all CSB should be formulated with the new vitamin and mineral premix, which makes it CSB+.

**Table 11.1 WFP's new nutrition products**

<b>Commodities available or being developed</b>	<b>Description</b>	<b>Target group(s)</b>
<p>Complementary food supplements:            Micronutrient powder (MNP)            Lipid-based nutrient supplement (LNS): 20–45 g/d = 120–250 kcal/d, e.g. Nutributter™ (20 g/d), Plumpy Doz™ (45 g/d), Indian chickpea-paste (50 g/d)</p>	<p>A small highly nutritious complement added to a meal or the daily diet, to improve its nutritional value</p>	<p>Children 6–23 months and children 24–59 months</p>
<p>Ready-to-use foods (RUFs), such as Supplementary Plumpy™ and Indian chickpea-paste (RUFC): 90–100 g/d or more</p>	<p>Spreads comparable to RUTF (Plumpy Nut™) but used for treating moderate malnutrition. May be most effective food for this. Note: the Indian chickpea paste is still under development</p>	<p>Moderately malnourished children typically targeted by supplementary feeding programmes</p>
<p>Improved fortified blended foods (FBFs) such as CSB+ and CSB++</p>	<p>Being improved by more comprehensive vitamin and mineral mix (CSB+); for special use sugar, milk powder and oil are added (CSB++)</p>	<p>CSB+ is for people from 24 months onwards, especially to provide protein and micronutrients             CSB++ is for children 6–23 months and moderately malnourished children</p>
<p>Food fortification</p>	<p>Improves micronutrient intake, so contributes to controlling micronutrient deficiencies</p>	<p>General population, using staples (especially flours; rice fortification under development) and condiments (iodized salt, cooking oil with vitamins A and D)</p>

When to use	Ongoing or completed use by WFP: location and approximate numbers of beneficiaries reached
<p>Low-dose LNS (20–45 g/d) preferred for children 6–23 months where stunting at 24–59 months is high LNS (45 g/d) can also be used for blanket feeding in lean season, to prevent a rise in malnutrition</p> <p>MNP preferred where anaemia is widely prevalent but stunting not very high</p>	<p>MNP used in Damak, Nepal (8 500 under-5s), far western region of Nepal (114 000 under-5s), Kakuma, Kenya (50 000 refugees 6 months and older), EMOP Bangladesh (100 700 under-5s and 59 400 pregnant and lactating women), Cox Bazaar, Bangladesh (27 000 refugees: under-5s, pregnant and lactating women, adolescent girls), Afghanistan (95 000 primary schoolchildren), India (71 000 primary schoolchildren), Cambodia (5 300 primary schoolchildren), United Republic of Tanzania (5 750 primary schoolchildren) and EMOP Peru (7 000 children 6–36 months)</p> <p><i>Plumpy Doz™</i> used in Sudan (18 000 children 6–36 months)</p> <p><i>Nutributter™</i> pilots started in Dadaab, Kenya and Algeria in collaboration with UNHCR (small-scale as yet)</p>
<p>In programmes for treating moderate malnutrition</p>	<p><i>Supplementary Plumpy™</i> used in Ethiopia (40 000 under-5s), Somalia (22 000 and 63 800 under-5s) and Yemen (21 921 under-5s)</p> <p><i>Indian chickpea paste</i> still under development, has been used at small scale in Bihar floods, India (15 000 children 6–23 months)</p>
<p>CSB+ replaces all CSB; other FBFs will also have the improved premix</p> <p>CSB++ can be used for blanket feeding of children 6–23 months and for children on supplementary feeding programmes. Alternative choice for blanket feeding is LNS (20–45 g/d); alternative for supplementary feeding is RUF</p>	<p>CSB+ should replace all CSB from January 2010. The new premix is more bulky and consists of several components, so appropriate guidance is being prepared for manufacturers</p> <p>Production of CSB++ started in Europe in January 2010. The more stringent specifications – de-hulling soybeans, tighter aflatoxin and microbiological contamination criteria – mean that producers must make substantial changes to production and quality control processes</p>
<p>Fortified staples and condiments should always be used, unless whole-grain staples are distributed because they cannot be processed. In this case, small-scale fortification should be explored (small mills, home- or institution-fortification using MNP)</p>	<p>Ongoing efforts by WFP and partners to fortify other foods, such as rice (pilot to be started in Egypt and possibly India), date-bars (used in Gaza and Egypt), cassava (Zambia)</p> <p>Meanwhile, WFP supports implementation of new WHO fortification guidelines for flours and other commodities, which means ensuring that fortificants have adequate bioavailability (i.e. are properly used by the body)</p>

