

Improving the Diet Quality of Young Children in the Guatemalan Western Highlands

Validation of Food-Based Recommendations to Optimize Diets Using Local Foods

The prevalence of stunting in children under 5 years of age is high in the Western Highlands of Guatemala (see Table 1), and is in part a consequence of poor infant and young child feeding practices among children under 2 years. Anemia among children under 5 is also widely prevalent. Both stunting and anemia are significant risk factors of poor cognitive development in children that results in poorer school performance during childhood.

The USAID-funded Food and Nutrition Technical Assistance III Project (FANTA) partnered with the Institute of Nutrition of Central America and Panama (INCAP) to use Optifood, a linear programming software package, to identify a set of evidence-based and population-specific dietary messages known as food-based recommendations (FBRs) specifically targeted for children 6–23 months of age and pregnant and lactating women. While it is known that the frequency of feeding and diversity of foods offered are low, much less is understood about the extent to which the diet of children under 2 can be improved using local foods and whether families could adopt improved dietary practices for feeding their children. The results from the first phase of the Optifood study found that the problem nutrients for children under 2 included iron, zinc, and calcium (see Table 2).¹ The findings also noted that the consumption of animal protein was low relative to the total protein consumed, which was largely plant-based due to the high consumption of maize.

Based on this first phase of data, Optifood was used to develop a set of FBRs for children under 2 that included separate sets of recommendations for 6–11 months and 12–23 months that address problem nutrients by recommending consumption of specific locally available foods available for the lowest cost. Each FBR described the food being promoted—potatoes, eggs, beans, fortified porridge, and green leafy vegetables—and provided guidelines on the frequency and quantity to be consumed. In the case of porridge made with a fortified blended flour, such as Incaparina or Vitacereal, the FBR also

Table 1. Prevalence of Stunting in Children 3–59 Months and of Anemia in Children 6–59 Months

	Stunting %	Anemia %
National	50	48
Huehuetenango	70	48
Quetzaltenango	43	40
Quiché	72	47
San Marcos	54	53
Totonicapán	82	62

Source: Ministerio de Salud Pública y Asistencia Social. 2010. *Encuesta Nacional de Salud Materno Infantil 2008-2009*.

Table 2. Problem Nutrients for Breastfed Children by Age

	6-8 months	9-11 months	12-23 months
Calcium	problem nutrient		
Iron			problem nutrient
Zinc		problem nutrient	

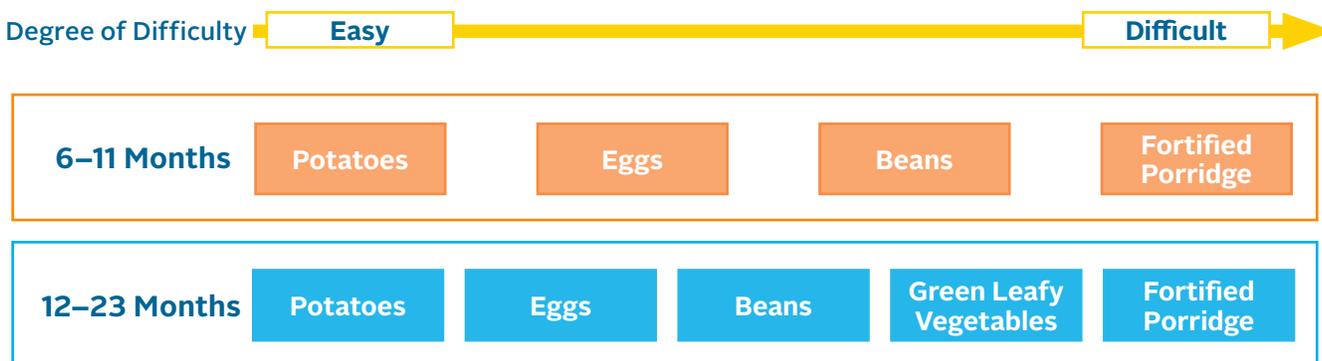
provided recommendations on the texture of the preparation. As a follow-on to the first phase of the Optifood study, the trials of improved practices (TIPS) method was used to determine the feasibility and acceptability of the FBRs and validate them. This second phase involved collecting data in Quiché and Huehuetenango through interviews conducted over three household visits with 10 mothers of children 6–11 months of age and 17 mothers of children 12–23 months of age to try the FBRs. Two focus group discussions with mothers of children 6–23 months and seven key informant interviews with health providers or community leaders were also conducted.

¹ Problem nutrients, as defined in Optifood, are nutrients that are likely to remain low in diets due to the availability of and/or access to local food sources and existing dietary patterns.

Key Findings

- The foods recommended in the FBRs were generally acceptable to mothers and other family members, but feasibility of trying each of these FBRs at the recommended frequency and quantity was more challenging (see Figure 1). Providing children with the recommended quantity of food appeared more feasible than feeding the food with the required frequency. In several cases when children initially rejected certain FBR foods such as fortified porridge made with Incaparina, some mothers were quick to conclude that their child did not like the food, rather than considering that the child may need encouragement to try it a few times to develop a preference for it.
- Overall, mothers of children under 2 were not able to implement the full set of FBRs together. While the extent to which mothers could implement each FBR varied, the findings suggest that among children under 2, providing potatoes, eggs, and beans was slightly more feasible than providing micronutrient fortified porridge as recommended. For children 12–23 months, feeding them the recommended green leafy vegetables was moderately feasible as mothers reported they could get the vegetables because it grew near their homes at that time of the year.
- It is common to feed young children broth (*caldo*) made from cooking FBR foods such as beans or vegetables, as well as feeding very watery hot drinks (*atoles*) rather than porridges, which meant that children did not receive a high density of calories and nutrients from these foods. Additionally, mothers expressed concerns over the safety of certain foods such as eggs and mashed whole beans being offered to young children. Some felt the portion sizes and overall quantity of food being recommended would be too much for young children.
- Despite these challenges, mothers of children under 2 demonstrated a strong willingness to try the recommended FBRs, and families were supportive of efforts to improve children's nutrition. Some of the recommended foods have also been promoted by health providers in the area.
- Challenges to implementing the FBRs included financial constraints, variable income in different seasons, inability to store perishable foods, and cost of traveling to and inability to access markets often enough to buy fresh foods. Also, many women reported that they felt most foods would have to be purchased and prepared for the whole family, and since family sizes are often large, the quantity they would have to purchase made the food too expensive to consume as recommended by the FBRs. For example, providing children with the recommended frequency of beans in several cases was challenging due to cost. Certain foods such as Incaparina were considered to be particularly expensive.
- Vitacereal was not being distributed at the time of data collection in any of the study communities, and Chispitas (a multiple micronutrient powder) was irregularly provided. Lack of Vitacereal negatively affected families being able to put the FBR for porridge into

Figure 1. Scale of Difficulty of Food-Based Recommendation Implementation



practice, as Incaparina then needed to be purchased to make the porridge.

- Influence of mothers-in-law and husbands was significant. In many cases these family members controlled mothers' access to money for purchasing the recommended foods and determined which foods were purchased for family consumption and how they were used. This was especially the case for younger parents. However, several young mothers checked with their mothers or mothers-in-law before trying a FBR and then received encouragement for the practice.

Implications

A revised set of FBRs was developed (see Figure 2) based on further Optifood testing that examined the impact of adjusting the FBRs to make their adoption more feasible, as well as combining the

FBRs with different scenarios of micronutrient supplementation, multiple micronutrient powders (MNPs), and fortified blended flour. The analysis showed that when micronutrient supplements or MNPs are consumed along with a feasible set of FBRs that includes fortified blended flour, these combinations are capable of supplying most problem nutrients for children 6–23 months, provided the supplements or MNPs are consistently available and consumed with the recommended frequency. For several of the FBRs, the challenges to feasibility point to the need for specific steps that would improve diet quality for children under 2. These include:

- Expanding access to micronutrient powder (Chispitas) and fortified blended flour (such as Incaparina, Vitacereal, or others with a similar composition) distributed through the government, donors, or private-public partnerships.

Figure 2. Food-Based Recommendations for Children

6–11 Months	12–23 Months
<ol style="list-style-type: none"> 1. Continue to breastfeed on demand. 	<ol style="list-style-type: none"> 1. Continue to breastfeed on demand.
<ol style="list-style-type: none"> 2. Give your child fortified porridge 5 times per week, or as often as possible. <i>Serving size: 1 tablespoon of dry fortified blended flour mixed with 1/3 cup of boiled or treated water.</i> 	<ol style="list-style-type: none"> 2. Give your child fortified porridge 4 times per week. <i>Serving size: 2 tablespoon of dry fortified blended flour mixed with 1/3 cup of boiled or treated water.</i>
<ol style="list-style-type: none"> 3. Give your child half an egg at least 3 times a week. <i>Serving size: 1/2 of a well-cooked, medium-sized egg (yolk and white).</i> 	<ol style="list-style-type: none"> 3. Give your child an egg at least 4 times a week. <i>Serving size: 1 well-cooked, medium-sized whole egg (yolk and white).</i>
<ol style="list-style-type: none"> 4. Give your child beans 3 times a week. <i>Serving size: 2 tablespoons of cooked beans. Prepare mashed, pureed, or refried.</i> 	<ol style="list-style-type: none"> 4. Give your child beans 4 times a week. <i>Serving size: 2 tablespoons of cooked beans. Prepare whole, mashed, pureed, or refried.</i> 5. Give your child green leafy vegetables 4 times a week. <i>Serving size: 1/2 a cup of cooked green leafy vegetables, for example, Swiss chard, spinach, or macuy leaves.</i>

- Reviewing the formulation of MNPs and fortified blended flour to include micronutrients such as zinc, iron, and others that are difficult to obtain through foods that are currently consumed.
- Expanding access to nutrient-dense foods such as animal-source foods and fruits and vegetables through increased access to local markets and home production where possible.
- Exploring options for improved storage of perishable foods.
- Improving incomes so families can afford more nutrient-dense foods and perhaps subsidizing the cost of certain foods.
- Exploring options for increasing access to markets either through transport initiatives or incentives for providers/producers to increase deliveries to remote communities.
- Exploring how families and communities can meet the specific nutritional needs of women and children while respecting the cultural norm to distribute food resources equitably, given that pregnant and lactating women and children are not identified as vulnerable in the current socio-cultural context.
- Targeting social and behavior change efforts toward particular feeding challenges for children 6–11 months who are at highest risk of becoming malnourished due to the complexity of feeding behaviors related to frequency of feeding, responsive feeding, food hygiene practices, and quantity, quality, and variety of the diet required. More focused attention is needed, especially for children 6–8 months, to address the challenges in implementing optimal feeding practices to protect their nutritional well-being from a young age.

This brief focuses on household trials of food-based recommendations for children 6–23 months. A comprehensive report is available that also includes results from household trials among pregnant and lactating women.

Learn more about the Guatemala Optifood study at www.fantaproject.org/tools/optifood.



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