Validation of Food-Based Recommendations Developed using Optifood for Groups at Risk of Nutritional Deficiencies in the Western Highlands of Guatemala

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INTRODUCTION

Stunting affects up to 62% of children under 5 years of age in some areas of the Western Highlands of Guatemala, and anemia is also a high-risk pregnancy and child health problem. Malnourished children may also be more likely to develop chronic diseases in adulthood. Many factors contribute to chronic malnutrition in Guatemala, including suboptimal infant and young child feeding practices, low dietary diversity, food insecurity, lack of clean water and sanitation, poor hygiene, and poor access to health services, as well as poor maternal nutrition. The promotion of appropriate complementary feeding has been identified as one of the most effective strategies for reducing stunting.1 Along with optimal infant and young child feeding practices, the World Health Organization recommends that food-based recommendations (FBRs) be used in social and behavior change communication to promote the consumption of nutrient-dense, diverse locally-available foods to the extent possible, and promote the use of micronutrient supplements only when necessary to address critical nutrient gaps.2

METHODS

FANTA collaborated with INCAP to develop and validate a set of evidence-based and population-relevant FBRs for pregnant and lactating women and children ages 6-23 months in the Western Highlands of Guatemala. Development and validation of the FBRs was undertaken in two phases; each based in Huehuetenango and Quiche, one of the two provinces in the Western Highlands of Guatemala.

Phase 2: Developing the FBRs using Optifood. In the first phase of the study, the Optifood software was used to determine which combination of local foods would provide the best diets for the target groups, which nutrients were likely to remain low in diets based on available food and socio-cultural preferences, and how much these diets would cost. Dietary data was collected in 2001–2003 from a cross-sectional dietary survey of 381 children 6-23 months of age and 154 PLW. A market survey provided information on locally-available foods and their prices. Dietary data were then analyzed using Optifood to pinpoint nutrients that were inadequate in the local diet and identify the best food combinations that could meet the diet and nutrient needs of the target groups. From this analysis, preliminary FBRs were developed.

Phase 2: Pilot trial. In 2003, a pilot activity was undertaken in Huehuetenango by the London School of Hygiene and Tropical Medicine, INCAP, and Nutri-Salud to test the feasibility and acceptability of the preliminary FBRs for children 6-11 months.2 Initial insights were useful, particularly regarding women's unfamiliarity with some of the recommended foods and willingness to try the recipes. Further validation with these and additional target groups was essential to provide more information about whether the FBRs needed to be modified to improve the likelihood that they would be accepted and put into practice.

Phase 3: Validating the FBRs. In 2010, the “Trials of improved practices” methodology was used to test the feasibility and acceptability of the FBRs identified in Phase 2 with each of the target groups. The trials were conducted in six communities among 10 mothers of children 6-23 months, 17 mothers of children 23-36 months, and 21 PLW in the same areas of the Western Highlands where the original dietary data was collected. Participants were asked to practice the set of FBRs during a 3-week period and participate in a 26-hour dietary recall, food frequency questionnaires, and three interviews about the FBRs. Including their intentions to put them into practice, perceived difficulties or barriers, and any changes and substitutes introduced. Combining each FBR food serving size and frequency were left with the household to help them understand the FBRs, as well as a weekly calendar with examples of how the FBRs could be consumed in one day. In addition to the trial's data, focus group discussions, 5 agricultural and livestock observations, and a market survey were conducted to examine availability and access to foods, seasonal agricultural practices, time available for women to try the FBRs, and the existing enabling environment to support the implementation of the proposed FBRs.

FINDINGS

Quality of the diet. The initial dietary survey found that the respondents’ diets were largely food-based with limited use of animal-source and fortified foods (such as the thin boiled flour “frijoles”, and lacking in overall dietary diversity, including fruits and vegetables. The most commonly consumed foods included beans and corn dough. Prepared foods were dominates consumed by over half of children and almost three-quarters of PLW. For target groups, the Optifood analysis found that the foods that the local food supply is unlikely to provide sufficient levels of vitamins and minerals were identified.4

The FBRs developed using Optifood filled most nutrient gaps in the diet, except iron and zinc for children 6-8 months of age and iron for pregnant women, suggesting the need for micronutrient supplements to fill these nutrient gaps. Some of the recommended foods, such as FFB, were critical for meeting specific nutrient needs. The Government of Guatemala and children and women need micronutrient supplements in powder form (Chapita) for children, but distribution is not consistent.2

FBR trials. Feedback from mothers and other community members revealed that the recommended foods themselves were generally considered acceptable by the families who tried them. Beliefs and preferences did not deter most women from trying the FBRs—but UI and UNF felt motivated to try them since they perceived them as a benefit to their own and their child’s well-being. However, putting the FBRs into practice with the recommended frequency and quantity was difficult. Figure 1 shows the degree of difficulty in adapting the FBRs. PLW faced challenges with the recommendation to consume 4 servings of vegetables daily, but reported that daily consumption of the thick fortified drink (atole express) and soybean milk was feasible. For children, fortified porridge was by far the most challenging FBR, due to the perceived high cost of purchasing an FBR, as well as the fact that some children had rejected the fortified porridge preparation. In contrast, the potato and egg FBRs were considerably easier for families and acceptable to children, despite some mothers’ reluctance to give egg to children under 1 year of age. This phase showed that children were often provided with beans or vegetable broth, rather than the foods themselves, resulting in low nutrient density of foods.3

OBJECTIVE

To better understand how the diets of pregnant and lacitaring women (PLW) and children 6-23 months can be optimized using locally-available, affordable, highly-nutrient density foods.

CHALLENGES TO IMPLEMENTING THE FBRS

Challenges to implementing the FBRs included financial limitations, seasonal price variations, difficulties in accessing and storing fresh foods, and the cost and time associated with transport to markets. Due to a culture of sharing food equally among family members, young children and PLW are not given priority in the household, and most interviewees suggested that they would need to buy the recommended food for the whole family, increasing the cost. Women found that the lack of physical and economic access to nutrient-dense food is an important barrier, demonstrating that improvements must come from strengthening access to nutritious food; strengthening family and community support; and promoting and prioritizing women and children's dietary needs in the household. Given the low consumption of fortified food (such as FFB) and supplements (such as the multi-micronutrient powder Chapat) were also important barriers to implementing the FBRs and meeting nutrient needs.

Recognizing the difficulties that some families faced trying the FBRs, further Optifood testing was carried out to examine the impact of adjusting the FBRs to make their adoption more feasible and, in some cases, combining the FBRs with different scenarios of micronutrient supplementation or FFB. Due to the relatively low nutrient density of potatoes and difficuty in obtaining fresh foods, the new set of FBRs limited the potato recommendation for children and PLW. Oftimes were omitted for PLW due to reported difficulty with access during the rainy season. Additionally, the modified FBRs limited the vegetable servings for PLW to 28 and 14 per week, given a variety of challenges reported accessing and consuming multiple portions on a daily basis (see Figure 2). The analysis showed that when micronutrient supplements are consumed along with a flexible set of FBRs, this combination is capable of supplying most required nutrients for PLW and children 6-23 months; provided the supplements are consistently available and consumed with the recommended frequency.

FIGURE 2. FBRs FOR WOMEN AND CHILDREN IN THE WESTERN HIGHLANDS OF GUATEMALA

The findings from the study indicate it is possible to improve the quality of the diet of vulnerable women and children by developing and promoting a set of FBRs based on an optimal set of nutrient-dense local foods that meet most nutrient needs. However, the results also indicate that affordability and accessibility of micronutrient-rich foods present significant hurdles. In the study communities, local foods are not sufficient to close the low nutrient gap and achieve diet adequacy. Other strategies, such as fortified foods or micronutrient supplements are also needed. By strengthening nutrition practices, household food production, economic and market access, and national programs, children’s and PLW’s nutritional status could be improved leading to a healthier and more productive population. Some of the study recommendations include promoting nutrient-dense local foods and promoting their economic access, supporting access to local markets or mobile vendors, assuring the procurement and distribution of nutrient-dense local foods and improved, improving their formulations, improving storage options for perishable foods, identifying and promoting other local foods with similar nutrient profiles for seasonal or cultural applications, and targeting social and behavior change efforts toward particular challenges in food consumption. Such programmatic and policy approaches, while complex, are expected to be fundamental steps to address the intractable problem of stunting in Guatemala.