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Report of Formative Research Conducted in Alta Verapaz, Guatemala, to Help Inform the Health-Strengthening Activities and the Social and Behavior Change Communication Strategy That Will Be Implemented through the Mercy Corps PM2A Program – PROCOMIDA

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September 2012

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This report is made possible by the generous support of the American people through the support of the Office of Health, Infectious Diseases, and Nutrition, Bureau for Global Health, and the Office of Food for Peace, Bureau for Democracy, Conflict and Humanitarian Assistance, U.S. Agency for International Development (USAID), under terms of Cooperative Agreements GHN-A-00-08-00001-00, AID-OAA-A-11-00014, and AID-OAA-A-12-00005 through the Food and Nutrition Technical Assistance III Project (FANTA), managed by FHI 360.

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Published September 2012

Recommended Citation:

Olney, Deanna et al. 2012. *Report of Formative Research Conducted in Alta Verapaz, Guatemala, to Help Inform the Health-Strengthening Activities and the Social and Behavior Change Communication Strategy That Will Be Implemented through Mercy Corps PM2A Program – PROCOMIDA*. Washington, DC: FHI 360/FANTA.

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Abbreviations and Acronyms

AIEPI/AINM-C	La Atención Integrada a las Enfermedades Prevalentes de la Infancia/Atención Integral de la Niñez y la Mujer a Nivel Comunitario (Integrated Care of Prevalent Childhood Illnesses/Integrated Health Care for Women and Children in Communities)
ASF	animal-source food
BCG	Bacillus Calmette-Guerin (vaccine)
CC	convergence center
CHW	community health worker
CIENSA	Centro de Investigaciones en Nutrición y Salud (Research Center for Nutrition and Health)
CSB	corn-soy blend
DPT	diphtheria, pertussis, and tetanus (vaccine)
EBF	exclusive breastfeeding
EBS	Equipo Básico de Salud (Basic Health Services Team)
FA-MCHN	food-assisted maternal and child health and nutrition
FANTA-2	Food and Nutrition Technical Assistance II Project
FAO	Food and Agriculture Organization of the United Nations
FC	*facilitador comunitario* (community facilitator)
FI	*facilitador institucional* (institutional facilitator)
g	gram(s)
HIV	human immunodeficiency virus
IFA	iron and folic acid
IFPRI	International Food Policy Research Institute
IU	international unit(s)
IYCF	infant and young child feeding
kcal	kilocalorie(s)
kg	kilogram(s)
LNS	lipid-based nutrient supplement
mg	milligram(s)
ml	milliliter(s)
MN	micronutrient
MNP	micronutrient powder
MSPAS	Ministerio de Salud Pública y Asistencia Social (Ministry of Public Health and Social Assistance)
NGO	nongovernmental organization
OPV	oral polio vaccine
ORS	oral rehydration solution
PAHO	Pan American Health Organization
PM2A	Preventing Malnutrition in Children under 2 Approach
PROCOMIDA	Programa Comunitario Materno Infantil de Diversificación Alimentaria (Maternal and Child Community Food Diversification Program)
*Pro*PAN	Process for the Promotion of Child Feeding
SAM	severe acute malnutrition
SBCC	social and behavior change communication
SBS	*servicios básicos de salud* (Basic Health Services)
SD	standard deviation
SIAS	*Extensión de Cobertura-Sistema Integral de Atención en Salud* (Extension of Coverage-Integrated System for Health Care)
TT	Tetanus Toxoid (vaccine)

U.S.	United States
USAID	U.S. Agency for International Development
USAID/FFP	USAID Office of Food for Peace
WHO	World Health Organization

Executive Summary

This report details the results of the formative research conducted from November 2009 to October 2010 in collaboration with Mercy Corps on its Preventing Malnutrition in Children under 2 Approach (PM2A) program—Programa Comunitario Materno Infantil de Diversificación Alimentaria (PROCOMIDA) (Maternal and Child Community Food Diversification Program). The inclusion of formative research in the design phase of a program aims to assess the local situation to develop program activities according to the local needs, beliefs, and perceptions to facilitate maximum impact.

The formative research conducted for PROCOMIDA included topics related to the three main program components:

1. Encouraging pregnant and lactating women and children under 24 months of age to attend regular preventive health consults
2. Providing a food ration that includes a combination of commodities both for the household (rice, beans, and vegetable oil) and either a fortified food (corn-soy blend [CSB]) or micronutrient (MN) supplement (lipid-based nutrient supplement [LNS] or micronutrient powder [MNP]) for individual beneficiaries (pregnant women, lactating women with a child under 6 months of age, and children 6–24 months of age)
3. Required participation in a social and behavior change communication (SBCC) strategy that focuses on improving key health- and nutrition-related behaviors

The research was specifically designed to assess the quality and use of preventive health services; test the acceptability of two types of MN supplements; assess current practices and beliefs related to maternal and child care, health, and nutrition; and develop recipes based on currently fed foods (including some that could incorporate the CSB that will be delivered through PROCOMIDA).

The information included in this report was shared with Mercy Corps as it became available and is being used to help inform the design of its SBCC strategy, as well as its health-strengthening activities. The information collected regarding the MN supplements has already been used to help determine the supplements that will be used in the program and will further be employed to develop SBCC materials related to the benefits and use of these products. In addition, it will help inform the design of the monitoring and evaluation activities related to the use of these products.

Objectives

The formative research for PROCOMIDA had four primary objectives associated with the three main components of PROCOMIDA listed above.

1. Assess the quality and use of health services in Alta Verapaz to help inform the health-strengthening activities to be implemented by Mercy Corps in the context of PROCOMIDA.
2. Test the acceptability of the LNS to be used in some program areas of PROCOMIDA.
3. Test the acceptability of the MNP to be used in some program areas of PROCOMIDA.
4. Assess current maternal and infant and young child care, nutrition, and health-related practices to help inform the development of PROCOMIDA's SBCC strategy.

Conclusion

Overall, the results of the formative research revealed that PROCOMIDA's program activities are needed in Alta Verapaz. These activities will likely be well received by the community members and health staff. In terms of the health-strengthening activities, it will useful for Mercy Corps to focus on improving

training of health staff at various levels, with a specific emphasis on providing additional trainings to the community-based staff and developing audio-visual materials for the trainings provided for the health staff and community members. Some of the key areas that Mercy Corps should emphasize in the trainings should include promising practices in infant and young child feeding (IYCF) (e.g., breastfeeding, complementary feeding); knowledge of danger signs during pregnancy and birth, postpartum, and during childhood; the importance of postpartum care; treatment of diarrhea and the use of oral rehydration solution; the prevention and treatment of anemia; and the appropriate use of MN supplements by pregnant and lactating women and children 6–23 months of age. Another area that Mercy Corps could focus on is working with the Ministerio de Salud Pública y Asistencia Social (MSPAS) (Ministry of Public Health and Social Assistance) to improve the availability and distribution of MN supplements at the convergence centers for pregnant and lactating women and for children 6–23 months of age, according to existing MSPAS protocols. Inputs into these two general areas could result in significant improvements in the knowledge of health staff and community members and potentially in the regular use of MN supplements by key target groups, both of which could contribute to improvements in the health and nutrition of pregnant and lactating women and children 6–23 months of age.

The assessment of maternal and infant and young child care, nutrition, and health-related practices revealed strengths and weaknesses. The most commonly cited barrier to following promising practices was insufficient economic resources, which cannot be directly addressed through the SBCC strategy, but may be improved by the provision of food rations. There are some beliefs and preferences, however, that may be effectively addressed through a well-implemented SBCC strategy. For example, though breastfeeding is the norm, there are some specific beliefs that may impede exclusive breastfeeding (EBF), such as that mothers cannot produce "sufficient" milk and that breast milk does not always "quench" a baby's thirst. Messages to help change these beliefs can be directly included in the SBCC strategy and may help improve the prevalence of EBF among women participating in PROCOMIDA. Related to complementary feeding, mothers demonstrated an overall preference for giving children 6–23 months of age soups and stews as a primary complementary food. The recipe trials revealed that the use of these foods, given in the amounts observed during the recipe trials, likely contribute to shortfalls in energy and MN needs. The recipes that included CSB were more likely to allow children to meet their energy needs, but they did not allow them to meet some of their MN needs (e.g., iron, zinc). There are a number of practices and beliefs that could be addressed through the SBCC strategy related to complementary feeding practices (e.g., initiating complementary feeding at 6 months of age, avoiding the use of broths as a primary complementary food, increasing the quantity of food and frequency of feeding as children get older). However, it is likely that infants and young children in Alta Verapaz will need some type of MN supplement to meet all of their MN needs.

To meet these needs, as part of the planned research study to follow the formative research phase, LNS and MNPs were distributed in some of the PROCOMIDA program areas to test if these supplements contribute to improvements in maternal and child health and nutritional status. The acceptability trials conducted as part of the formative research for both products were successful. In both cases, the supplements were well accepted by pregnant and lactating women and children 6–23 months of age. Though the supplements were well accepted, there were some minor adverse effects reported in association with the use of the MNP that will need to be closely monitored over the course of the program. The ongoing acceptance and use of these products and any potential adverse effects will need to be monitored throughout the program.

The Mercy Corps SBCC strategy will likely be most successful if it focuses on those behaviors that seem to have the most room for improvement and that people will be able and willing to adopt. In addition, adoption of promising practices is likely to be increased if the specific beliefs and perceptions that were expressed as barriers to following those practices are addressed in the SBCC strategy. Pregnant and lactating women, mothers of children 6–23 months of age, fathers, grandmothers, and health staff should

all be target populations for the SBCC strategy. All of these populations are eager to receive more training on these topics. Though there is a good deal of knowledge on a number of topics, there is still room for improvement in a number of areas as indicated from this research. To be most successful, the SBCC strategy should employ a number of different methods for delivering the key messages, such as through small group meetings, radio spots, recipe trials, and illustrated guides that can be given to health workers to remind them about the important points related to key topics.

The results of the formative research have provided some insights into key areas that Mercy Corps can address through its health-strengthening activities and SBCC strategy. In addition, it has provided some initial evidence that the MN supplements that will be provided through the program were acceptable by members of the target population. Improvements in knowledge and practices among health workers and community members can lead to improvements in maternal and child health, care, and nutrition-related practices; these in turn can contribute to improvements in maternal and child health and nutritional status. The provision of MN supplements may further help improve maternal and child health and nutritional status, though the acceptability, use, and effectiveness of these supplements will need to be addressed through the ongoing research activities.

1. Introduction

1.1. Background

Over the last few years, the need to focus on preventing malnutrition during the first 2 years of life has received much attention from the international development community [6,7]. In response, the U.S. Agency for International Development (USAID) Office of Food for Peace (USAID/FFP) collaborated with the Food and Nutrition Technical Assistance II Project (FANTA-2) to develop the Preventing Malnutrition in Children under 2 Approach (PM2A) [8]. PM2A was developed based on evidence from a study conducted in Haiti that provided the first programmatic evidence that preventing malnutrition before the age of 2 years was more effective in reducing the prevalence of stunting than addressing malnutrition after it has already occurred through the more traditional recuperative approach [7].

PM2A includes a package of health and nutrition interventions aimed at preventing child[1] undernutrition. One of the key components is the distribution of food assistance. PM2A aims to reach all pregnant women, lactating women during the first 6 months postpartum, and children 6–24 months of age [8]. This represents a shift from traditional food-assisted maternal and child health and nutrition (FA-MCHN) programs, which have targeted children based on their nutritional status. The key principle underlying PM2A is the *prevention* of child undernutrition through blanket targeting of mothers and children during the 1,000 days between conception and the child's second birthday. The main goal of PM2A is to prevent child undernutrition by addressing the key underlying determinants of nutrition: access to sufficient and adequate **food**, access to—and use of—**health** services, and receiving adequate feeding and **care** (also referred to as Food, Health, and Care) [9].

In Guatemala, the PM2A program is being implemented by Mercy Corps and is called the Programa Comunitario Materno Infantil de Diversificación Alimentaria (PROCOMIDA) (Maternal and Child Community Food Diversification Program). PROCOMIDA addresses the three underlying determinants of undernutrition (Food, Health, and Care) through the following set of interventions:

- **Food:** Providing a food ration, which includes a household (family) ration (rice, beans, and vegetable oil) and an individual ration (either a fortified food, such as corn-soy blend [CSB], or a multiple micronutrient [MN] supplement in the form of a lipid-based nutrient supplement [LNS] or micronutrient powder [MNP]); individual rations are provided to all pregnant women, lactating women with a child under 6 months of age, and children 6–23 months of age
- **Health:** Ensuring that pregnant and lactating women and children under 24 months of age attend regular preventive health consults by making their eligibility to receive the food assistance conditional on attending these consults; working with the nongovernmental organization (NGO) and health staff providing preventive health services in Alta Verapaz to strengthen these services by providing funding for a nutrition educator to work with the Equipo Básico de Salud (EBS) (Basic Health Services Team) of each NGO, training that focuses on improving key health- and nutrition-related[2] behaviors for all members of the EBS, and anthropometric equipment for each convergence center (CC), as well as training on the use of this equipment
- **Care:** Required participation in a social and behavior change communication (SBCC) strategy that focuses on improving key health- and nutrition-related behaviors

[1] In this report, "child" (or "children") is used to refer to infants and young children 0–23 months of age.
[2] Nutrition-related behaviors refer to infant and young child feeding (IYCF) practices, including breastfeeding and complementary feeding practices, micronutrient supplementation (for both mothers and children), and food intake and diet quality for pregnant and lactating women.

To design the best possible program, the International Food Policy Research Institute (IFPRI), in collaboration with Mercy Corps, carried out formative research with the overall aim of assessing the local situation to develop program activities that would respond to the local needs, beliefs, and perceptions of the population on issues related to the health and nutrition of mothers and young children. This research had four primary objectives.

1. Assess the quality and use of health services in Alta Verapaz to help inform the health-strengthening activities to be implemented by Mercy Corps in the context of PROCOMIDA.
2. Test the acceptability of the LNS to be used in some program areas of PROCOMIDA.
3. Test the acceptability of the MNP to be used in some program areas of PROCOMIDA.
4. Assess current maternal and infant and young child care, nutrition, and health-related practices to help inform the development of PROCOMIDA's SBCC strategy.

More detailed information about each of these broad objectives is provided in **Section 1.2**.

1.2. Objectives

Objective 1: Assess the quality and use of health services in Alta Verapaz to help inform the health-strengthening activities to be implemented by Mercy Corps in the context of PROCOMIDA

The overall research question addressed for this objective was whether and how the delivery and use of preventive health services can be improved through Mercy Corps health-strengthening activities.

Objective 2: Test the acceptability of the LNS to be used in some program areas of PROCOMIDA

The overall research question addressed for this objective was whether or not the LNS products specially formulated for the project were acceptable in terms of taste and other organoleptic properties and whether mothers were enthusiastic and positive about using them regularly for themselves or for their young child. To answer this question, acceptability tests were conducted with groups of (a) pregnant women and women with children under 6 months of age and (b) women with children 6–23 months of age (all target beneficiaries for PROCOMIDA).

Objective 3: Test the acceptability of the MNP to be used in some program areas of PROCOMIDA

There were two primary research questions related to the acceptability of the MNPs. The first was whether or not the MNPs are likely to be accepted and used by PROCOMIDA beneficiaries in the areas where they will be distributed. The second was to determine if a formulation designed to be taken twice per day was more acceptable than one designed to be taken once per day. The research was done with the same two subgroups of mothers as for the LNS acceptability trials.

Objective 4: Assess current maternal and infant and young child care, nutrition, and health-related practices to help inform the development of PROCOMIDA's SBCC strategy

This objective aimed to identify specific topics that should be emphasized in the SBCC strategy that Mercy Corps will implement in the context of PROCOMIDA and to suggest primary points of contact and modes of dissemination for the strategy. PROCOMIDA's SBCC strategy will focus on messages related to the first three objectives, namely utilization of health services, health-related knowledge and practices, and the proper use of the LNS and MNP. In addition, the strategy will have a strong focus on

topics related to maternal nutrition and infant and young child care and feeding practices. The specific objectives were as follows.

1. Describe the current practices, behaviors, and beliefs related to maternal diet during pregnancy and lactation and infant and young child feeding (IYCF) in a selection of communities in Alta Verapaz.
2. Identify the practices, behaviors, and beliefs that should be addressed in the SBCC strategy.
3. Provide suggestions on topics that should be included in the SBCC strategy to also promote the utilization of preventive health services and the use of LNS and MNP.

The specific topics that were addressed to inform the SBCC strategy are listed in **Appendix 1**.

1.3. Research design and methods

The formative research was implemented in three phases. Phase 1, which took place in November and December 2009, was used to collect information to help inform PROCOMIDA's SBCC strategy and its health-strengthening activities and consisted of general surveys, semi-structured interviews, focus group discussions, health facility assessments, and key informant interviews with health staff. Phase 2, which was conducted in February and March 2010, included recipe trials to further help inform the SBCC strategy and acceptability tests for the LNS products that will be used in some of the program areas. Phase 3, conducted in September and October 2010, included recipe trials for foods to prepare with CSB and acceptability tests for the MNPs.

Study area

One community from each of the municipalities that were selected to participate in PROCOMIDA was selected to participate in the formative research, which was conducted before program implementation began. Over the course of the formative research, the municipalities that were selected to participate in PROCOMIDA changed; thus, the municipalities represented in the formative research changed from the first two phases to the third to reflect the changes in PROCOMIDA's program areas. The originally selected municipalities for PROCOMIDA were Cahabón, Carchá, Cobán, Panzós, and Senahú, and the first two phases of the formative research were conducted in one community from each of these five municipalities. Prior to the implementation of PROCOMIDA, a decision was made to exclude Panzós and Senahú and to include the municipality of Lanquin instead. Therefore, Phase 3 was conducted in the municipalities that were finally selected to be included in PROCOMIDA, namely Cahabón, Carchá, Cobán, and Lanquin.

Study participants

Participants consisted of health staff members of the EBS, three groups of mothers (pregnant women and lactating women with children under 6 months of age, mothers with children 6–11 months of age, and mothers with children 12–23 months of age), fathers of children under 2 years of age, and grandmothers. Participants were selected from lists of eligible people provided through the health system. With the exception of some of the EBS health staff members, the primary language spoken by the majority of the study participants was Q'eqchi.

Methods

Various qualitative and quantitative methods were used to address the four objectives. These included:

- A health facility assessment
- Key informant interviews
- A general survey

- Semi-structured interviews
- Focus group discussions
- Acceptability trials for the LNS products
- Acceptability trials for the MNP products
- Recipe trials

The health facility assessment was used to gather information about the availability of health staff and supplies at five CCs to help inform health-strengthening activities. The general survey, semi-structured interviews, focus group discussions, and key informant interviews were used to collect information related to the health-strengthening activities and the development of the SBCC strategy. The acceptability trials were used to assess the acceptability of two new MN products that will be used in some of the PROCOMIDA areas. Finally, the recipe trials were used to develop improved recipes for complementary foods using either locally available foods and commonly prepared recipes or the CSB that will be distributed as part of PROCOMIDA. **Table 1.1** presents an overview of the methods used in the formative research as well as the sample size for each method.

Table 1.1. Samples sizes for each of the research methods by group[a]

Research method	Mothers	Fathers	Grandmothers	EBS[b]	CCs
Health facility assessments					5 (1)
Key informant interviews				29 (6)[c]	
General survey	120 (24)[d]				
Semi-structured interviews	30 (6)	10 (2)	10 (2)		
Focus group discussions	5 (1)	5 (1)	5 (1)		
Acceptability trials (LNS)	100 (20)[e]				
Acceptability trials (MNP)	96 (20)[f]				
Recipe trials (common recipes)	10 (2)[g]				
Recipe trials (CSB recipes)	5 (1)[g]				

[a] The numbers in the table are the number of times each method was carried out for each group, and the number in parentheses is the number completed per community for each group.
[b] The members of the EBS included as key informants were a doctor or nurse, nutrition educator, FI, FC, CHW, and a midwife.
[c] The CC in Panzós did not have a nutrition educator, so only five key informant interviews were completed for that CC.
[d] A total of 120 general surveys were completed, 24 per community (8 with pregnant women, 8 with mothers of children 6–11 months of age, and 8 with mothers of children 12–23 months of age).
[e] A total of 100 women participated in the LNS acceptability trials (50 pregnant and lactating women and 50 women with children 6–23 months of age). In most communities, 10 women in each category participated; however, this varied between 8 and 11 mothers depending on the group and community.
[f] A total of 96 women participated in the MNP acceptability trials (48 pregnant and lactating women and 48 women with children 6–23 months of age). In most communities, 10 women in each category participated; however, this varied between 8 and 11 mothers depending on the group and community.
[g] The numbers represent groups of 8–10 women with children 6–11 months of age or 12–23 months of age. For the common recipe trials, one group of 8–10 mothers of children of each of the two age groups participated, and for the CSB recipes only one group, either mothers of children 6–11 months of age or mothers of children 12–23 months of age, participated in the recipe trials.

These methods were used with different groups of participants to obtain a comprehensive view of the different topics. The groups that participated in the formative research included pregnant women and women with children 0–5 months of age, mothers of children 6–11 months of age, mothers of children 12–23 months of age, fathers, grandmothers, and key health staff members. In Table 1.1, the group "Mothers" encompasses the groups of pregnant and lactating women, mothers of children 6–11 months of age, and mothers of children 12–23 months of age. In some cases, these groups of women were combined into one group, as was the case for the focus group discussions, or into two groups for the acceptability trials, namely, pregnant and lactating women and mothers of children 6–23 months of age. **Table 1.2** illustrates the methods used to address each of the objectives. The general surveys, semi-structured

interviews, and focus group discussions were designed to gather information to address both Objectives 1 and 4. Therefore, these are listed under both of these objectives in Table 1.2.

Table 1.2. Methods used to address each of the main objectives, participating groups, and sample sizes

Objective	Method	Group	Sample size
1: Assess the quality and use of health services in Alta Verapaz to help inform the health-strengthening activities to be implemented by Mercy Corps in the context of PROCOMIDA.	Key informant interviews	Health staff	29
	Health facility assessment	CCs	5
	General survey	Pregnant women and mothers of children 0–23 months of age	120
	Semi-structured interviews	Pregnant women and mothers of children 0–23 months of age	30
		Fathers of children 0–23 months of age	10
		Grandmothers	10
	Focus group discussions	Pregnant women and mothers of children 0–23 months of age	5
		Fathers of children 0–23 months of age	5
		Grandmothers	5
2: Test the acceptability of the LNS to be used in some program areas of PROCOMIDA.	Acceptability trials, including focus group discussions and assessment of allergic reactions or adverse effects	Pregnant women and mothers of children 0–5 months of age	50
		Children 6–23 months of age and their mothers	50
3: Test the acceptability of the MNP to be used in some program areas of PROCOMIDA.	Acceptability trials of two different MNP formulations, including focus group discussions and assessment of allergic reactions or adverse effects	Pregnant women and mothers of children 0–5 months of age	48
		Children 6–23 months of age and their mothers	48
4: Assess current maternal and infant and young child care, nutrition, and health-related practices to help inform the development of PROCOMIDA's SBCC strategy.	Key informant interviews	Health staff	29
	General survey	Pregnant women and mothers of children 0–23 months of age	120
	Semi-structured interviews	Pregnant women and mothers of children 0–23 months of age	30
		Fathers of children 0–23 months of age	10
		Grandmothers	10
	Focus group discussions	Pregnant women and mothers of children 0–23 months of age	5
		Fathers of children 0–23 months of age	5
		Grandmothers	5
	Recipe trials (common recipes)	Mothers of children 6–11 months of age	5
		Mothers of children 12–23 months of age	5
	Recipe trials (CSB recipes)	Mothers of children 6–11 months of age	2
		Mothers of children 12–23 months of age	3

Data collection

As indicated above, data collection was done in three phases and conducted by three different teams. All of the teams consisted of local, experienced fieldworkers that were fluent in both Spanish and Q'eqchi. Phase 1 of the formative research was conducted with the assistance of Centro de Investigaciones en

Nutrición y Salud (CIENSA) (Research Center for Nutrition and Health) (a data collection firm based in Guatemala). Phase 2 was conducted by Mercy Corps field staff, and Phase 3 was conducted by fieldworkers hired by Mercy Corps. Trainings were held for each of the three phases of formative research, which were led by IFPRI and Mercy Corps. Mercy Corps was also actively involved in developing the packaging for the LNS and MNPs. Throughout the formative research process, Mercy Corps was an active partner in the design of the research as well as in the training and implementation of the formative research activities.

For Phase 1 of the formative research, IFPRI adapted the initial general surveys and semi-structured interviews from the Process for the Promotion of Child Feeding (*Pro*PAN).[3] The focus group discussion guides were developed by IFPRI to complement the semi-structured interviews, and the health facility assessment was developed by IFPRI with the help of Rafael Carranza, a medical doctor working for Mercy Corps, to reflect the supplies that are supposed to be available at the CCs based on MSPAS protocols. These instruments were then revised in collaboration with IFPRI, Mercy Corps, and CIENSA, and CIENSA reformatted the instruments for their data collection and data entry needs. Training for Phase 1 was conducted by CIENSA in collaboration with IFPRI and Mercy Corps. CIENSA was also responsible for hiring the field staff and for the data collection during the Phase 1. IFPRI and Mercy Corps also participated in the supervision of data collection throughout Phase 1.

Participants for the general surveys and semi-structured interviews were selected from lists of eligible people living in the selected communities (i.e., pregnant women or women with children under 6 months of age, mothers with children 6–11 months of age or 12–23 months of age, fathers with children under 2 years of age, grandmothers). People were randomly selected from these lists to participate until the sample size for each community and instrument was reached. The general surveys and semi-structured interviews were conducted at participant's homes. The focus groups were organized by holding a community meeting and asking for volunteers who fit the specifications of each group of mothers, fathers, and grandmothers. Focus groups were then held in the local community center or school building.

For Phase 2 of the formative research, IFPRI adapted the recipe trial protocols from *Pro*PAN and developed acceptability tests. Fieldworkers were selected from Mercy Corps staff that will be working for PROCOMIDA. Training was led by IFPRI and Mercy Corps nutritionist Marcela Arriola, with support from other senior Mercy Corps staff. The participants for the recipe trials and LNS acceptability trials were selected from amended lists from Phase 1.

Phase 3 of the formative research, which was implemented to test the acceptability of the MNPs and to conduct some recipe trials using the CSB that will be distributed by PROCOMIDA, was conducted in the fall of 2010. These activities were very similar to some of the work that was done during Phase 2, therefore Phase 2's instruments were adapted for use with the CSB recipes that were tested in Phase 3 and for the MNP acceptability trials. Marcela Arriola helped lead these activities by adapting the research instruments and conducting the training and fieldwork for Phase 3, with support from IFPRI.

For all three phases, the interview guides that were used with community members were taught to the team in Spanish and then the team worked together to agree on the translations into Q'eqchi. Selected translations were then validated with verbal back-translations. During the different training periods, all of the instruments were initially tested and adjustments made as necessary.

[3] *Pro*PAN is a tool for formative research and program planning in IYCF developed between 1998 and 2004 by the Pan American Health Organization (PAHO), Emory University, the Nutrition Research Institute in Peru, and the National Public Health Institute of Mexico. It describes the process for developing an appropriate SBCC strategy for IYCF, provides users with a step-by-step process for investigating nutritional and dietary problems, and provides the tools to design and evaluate interventions to address the problems that have been identified.

The semi-structured interviews, focus group discussions, general surveys, acceptability trials, and recipe trials done the community members were conducted in Q'eqchi, while the key informant interviews and health facility assessments were conducted in Spanish. The interviews were recorded at the time of the interview, and the interviews and focus group discussions that were conducted in Q'eqchi were then translated and rerecorded in Spanish by the person who conducted the interview as soon as possible following the interview. These Spanish recordings were later transcribed and the Spanish transcriptions were used for analysis. The comments and key discussion points during the acceptability trials and recipe trials were recorded directly into Spanish.

Data analysis

Health facility assessments, general survey, and acceptability trials

The data collected in the general survey and health facility assessments and quantitative information gathered from the acceptability trials were analyzed using SPSS version 18. Analyses of the general survey were conducted for the group of mothers as a whole and then separately for each group of mothers (pregnant women and mothers with children under 6 months of age, mothers of children 6–11 months of age, and mothers with children 12–23 months of age). Health facility assessments were analyzed by CC and for all five CCs visited combined. Analyses for the acceptability trials were done separately for pregnant and lactating women and for mothers with children 6–23 months of age.

Focus group discussions, key informant interviews, and semi-structured interviews

Qualitative data analysis software (Nvivo) was used to analyze the semi-structured interviews, focus group discussions, and key informant interviews. Two code lists were created according to the topics of interest: one for the semi-structured interviews and focus group discussions and another for the key informant interviews. The transcripts from each of the semi-structured interviews, focus group discussions, and key informant interviews were then coded in Nvivo according to these code lists. Finally, all of the coded transcript material was read and written up within a framework of the key, overarching issues addressed in the formative research, and organized around engaging specific subthemes that arose out of the coding process.

Recipe trials

The recipe trials were analyzed using qualitative and quantitative methods. The transcripts from the trials were examined to analyze the acceptability of the recipes for mothers and children and the feasibility of preparing these recipes at home. These transcripts consisted of observations by field staff and post-trial tasting feedback by mothers. Key points about the acceptability and feasibility of preparing these recipes were summarized and are described later in this report. The analysis of the nutrient content of these recipes was based on the current World Health Organization (WHO) recommendations for complementary feeding [10]. The adequacy of the recipes was assessed for energy, protein, iron, vitamin A, and zinc. NutriSurvey for Windows, 2007 version (c) [2], was used for the analysis of the nutrient composition of the recipes (in conjunction with additional food composition databases when necessary from Guatemala and the Food and Agriculture Organization of the United Nations [FAO]). Further details related to the methods, samples, and data analysis used to address each objective are provided in each section.

1.4. Sharing of the research findings

The preliminary results from the first two phases were shared with Mercy Corps at a workshop held in Cobán, Guatemala, in March 22–26, 2010, and have been discussed with Mercy Corps staff extensively since then. This workshop focused on the results related to the acceptability of the LNS as well as the information collected on current maternal and infant and young child care, nutrition, and health-related

practices that could be used to help inform the development of the PROCOMIDA's SBCC strategy. The results related to the quality and use of health services in Alta Verapaz to help inform the health-strengthening activities to be implemented by Mercy Corps in the context of PROCOMIDA were also shared briefly at this workshop and then further discussed at a meeting in Washington, DC, in June 2010. The write-up of the results of the acceptability trials for MNPs (Phase 3) was shared with Mercy Corps on November 4, 2010.

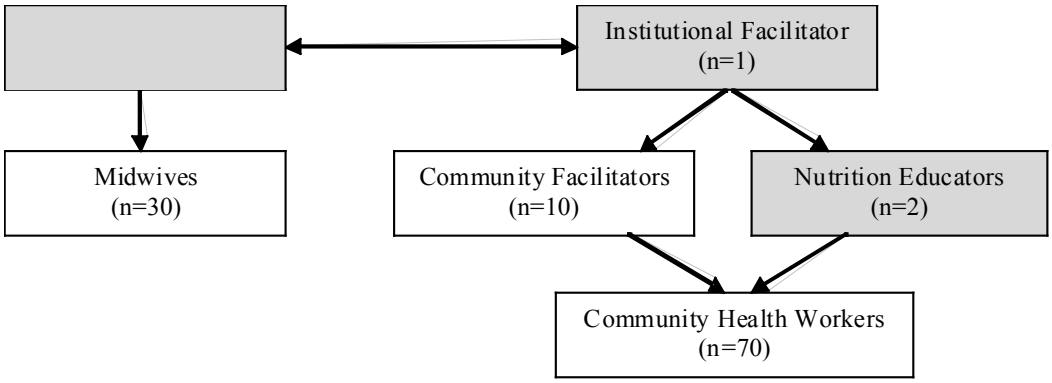
2. Objective 1: Assess the quality and use of health services in Alta Verapaz to help inform the health-strengthening activities to be implemented by Mercy Corps in the context of PROCOMIDA

2.1. Introduction

Provision of preventive health services in Alta Verapaz is implemented through *Extensión de Cobertura–Sistema Integral de Atención en Salud* (SIAS) (Extension of Coverage–Integrated System for Health Care). SIAS was introduced in Guatemala as part of the 1996 Peace Accords and is managed by the MSPAS [3]. The system aims to expand health coverage to the largely rural population and to improve the quality of these services by providing *services básicos de salud* (SBS) (basic health services) to pregnant and lactating women and children under 5 years of age through contracts with local nongovernmental organizations (NGOs). This expanded coverage into more rural areas where other health facilities are not available is referred to as the *Programa de Extensión de Cobertura* (Extension of Coverage Program). These SBS consist primarily of preventive health visits (prenatal and postnatal for women and monthly growth monitoring and annual check-ups for children), which are conducted at community CCs, central locations or facilities in the community where preventive health visits can be held. In addition to consults, women and children are provided with the recommended MN supplements and vaccinations as well as basic medicines if prescribed by the doctor or nurse. The SBS also include guidelines for the provision of care and referrals for people who are sick or who have a medical emergency as well as for education related to health and nutrition, hygiene, and care for the environment. NGOs are required by the Ministerio de Salud Pública y Asistencia Social (MSPAS) (Ministry of Public Health and Social Assistance) to comply with these guidelines. The MSPAS is expected to supply the implementing NGOs with the necessary resources (money, equipment, and supplies) for the training of health staff and for service delivery.

The SBS are provided by a team of health personnel called the Equipo Básico de Salud (EBS) (Basic Health Services Team). The EBS for each contracted NGO consists of a doctor or nurse, a *facilitador institucional* (FI) (institutional facilitator), *facilitadores comunitarios* (FCs) (community facilitators) (up to 10), community health workers (CHWs) (up to 70; one for every 30 families), and midwives (up to 30) (**Figure 1.1**). Many EBS also include a nutrition educator. The FCs, midwives, and CHWs are community members selected by their communities, whereas the nurses, FIs, and nutrition educators are hired by the implementing NGOs and rotate between communities in their program areas on a regular basis, providing health services on particular days. The nurse, FI, and nutrition educator positions are all paid positions. The FCs, midwives, and CHWs are supposed to receive a small stipend for their work. This varies, however, and in some areas the midwife and CHW positions are voluntary. This team is expected to deliver the SBS through two primary mechanisms: monthly visits at the local CC and regular home visits.

Figure 1.1. Organizational chart of the EBS for a population of about 10,000 people[a]



[a] The shaded boxes represent paid positions, and the unshaded boxes represent positions that should receive small stipends. The arrows represent lines of supervision.

During the monthly consultations at the CCs, the doctor or nurse is responsible for the health consultations, prescribing any necessary medication, and referrals to other health services. The FI is responsible for growth monitoring and the provision of immunizations and MN supplements, and the nutrition educator is expected to give the health- and nutrition-related education. In addition to the monthly consultations at the CCs, the midwives and CHWs make regular home visits to the people in their communities. During these visits, the midwives focus on care for women during the pre-, peri-, and postnatal period. The CHWs reinforce educational messages and reminding women to go to the CC for pre- or postnatal care, to take their children for consultations and growth monitoring, and to receive vaccines and vitamins.

An initial visit to the study area and visits to a few of the CCs in June 2009, as well as Mercy Corps experience with working with the SIAS in Alta Verapaz, suggested that there were gaps in service delivery that may potentially be improved through some of Mercy Corps health-strengthening activities. Formative research was conducted to identify some of these gaps and to help guide Mercy Corps in deciding which gaps they could potentially address in their PM2A program. Aspects of both the supply and demand side of preventive health services in Alta Verapaz were investigated. Two important topics that were not investigated in the formative research were the perceptions of the health staff towards the community members and the perceptions of community members about how they are treated by the health staff. General perceptions about the health services were investigated but not specifically in relation to the health staff. The overall research question addressed was whether and how the provision and/or uptake of services could be strengthened. More specifically, we addressed the following questions.

Supply side

1. Are the supplies required by the SIAS available at the CCs, which are the main point of delivery of services for SIAS?
2. Do EBS staff have the background, training, and knowledge necessary to provide the SBS as planned?
3. Do EBS staff provide adequate and accurate nutrition- and health-related information to community members?
4. Are EBS staff motivated to do their work and satisfied with their jobs?

Demand side

5. Do community members have basic health- and nutrition-related knowledge?
6. Do pregnant women and children utilize the preventive health services offered at the CCs?

7. Are community members satisfied overall with the preventive health services available in their communities?

2.2. Research design and methods

Study area

The research was conducted in the five municipalities in Alta Verapaz that were originally selected to participate in PROCOMIDA: Cahabón, Carchá, Cobán, Panzós, and Senahú. In each of these municipalities, one community and its associated CC (each CC is responsible for a number of communities) was included in the research. These five communities represent both peri-urban and rural areas. The SBS in these communities are implemented by four different NGOs: Federación de Cooperativas de las Verapaces (FEDECOVERA), Asociación Bautista Kekchí de Desarrollo Cultural (ABK-DEC), Instituto de Cooperación Social (ICOS), and CaféSano.

Study participants

Study participants included members of the EBS associated with each of the five CCs as well as convenience samples of various community members, including pregnant women, mothers and fathers with children less than 2 years of age, and grandmothers. In addition, facility-level assessments were conducted at each of the five CCs. The primary language spoken by the community members is Q'eqchi. In general, the first language of the FCs, midwives, and CHWs is also Q'eqchi, whereas it is Spanish for the nurses, FIs, and nutrition educators.

Methods

Both qualitative and quantitative data collection methods were used in this study; these included a health facility assessment of the CCs; key informant interviews with members of the EBS; semi-structured interviews and focus group discussions with pregnant women and women with children less than 2 years of age, fathers and grandmothers; and a general survey to collect quantitative information on infant and young child feeding practices and on the utilization of health services (**Table 2.1**). A detailed description of the different methods used is provided below and the instruments are provided in **Appendix 2**.

Table 2.1. Samples sizes for each of the research methods, by group (Objective 1)[a]

	Mothers	Fathers	Grandmothers	EBS[b]	CCs
Health facility assessments					5 (1)
Key informant interviews				29 (6)[c]	
General survey	120 (24)[d]				
Semi-structured interviews	30 (6)	10 (2)	10 (2)		
Focus group discussions	5 (1)	5 (1)	6 (1)		

[a] The numbers in the table are the number of assessments completed for each group, and the number in parentheses is the number completed per community for each group.
[b] The members of the EBS included as key informants were a doctor or nurse, nutrition educator, FI, FC, CHW, and a midwife.
[c] The CC in Panzós did not have a nutrition educator, so there were only five key informant interviews completed for that CC.
[d] A total of 120 general surveys were completed, with 24 per community (8 with pregnant women, 8 with mothers of children 6–11 months of age, and 8 with mothers of children 12–23 months of age).

Health facility assessment

The health facility assessment instrument was developed by IFPRI, based on available MSPAS protocols for service delivery and equipment and supply availability at the CCs. This instrument included a checklist of health care professionals associated with each CC; EBS staff present on the day the CC was open and visited; and materials/supplies available at each CC (including but not limited to medicines and

vitamins). The assessment also included questions about referrals for serious medical conditions. These questions were asked to the head medical staff present on the day of the observation. A total of five health facility assessments were completed.

Key informant interviews: EBS

A key informant interview was developed for the six members of the EBS (doctor or nurse, nutrition educator, FI, FC, CHW, and midwife). The key informant interview was divided into four sections. The first focused on their prior work and school experience as well as any training they have received in relation to health- and nutrition-related topics. The second asked about advice given by the members of the EBS in relation to general health issues, child feeding, care and diet of pregnant women, care and feeding of nursing women, and care and feeding of sick children. The third section included a knowledge test of MSPAS recommendations for the provision of preventive health services for pregnant women, postpartum women, and children under 24 months of age; use of MN supplements; and other health and nutrition issues specific to children 0–23 months of age and pregnant and lactating women. The last section focused on the perceptions and beliefs of the EBS members in relation to the health care system as a whole, as well as their individual roles in the system.

General survey

The general survey was adapted from *Pro*PAN [11]. This survey includes questions about the use of MN supplements, use of health services, access to health and nutrition messages, and access and use of different media sources. Questions were added to *Pro*PAN's general survey to get more information about the use of the CCs and health seeking during illness. A question was also included about whether or not a mother would be willing to let her child give a drop of blood to find out the child's anemia status.

Semi-structured interviews with mothers, fathers, and grandmothers

The semi-structured interviews were adapted from *Pro*PAN [11] to include questions related to knowledge and use of MN supplements and fortified products, as well as knowledge and practices related to the use of preventive and curative health services during pregnancy, postpartum, and childhood. The questions were designed to also gather information about the reasons behind the actual practices and to identify potential barriers and facilitators to improving knowledge and/or changing practices that are less than ideal.

Focus group discussions

Focus group discussions were conducted separately with groups of pregnant women and women with children under 2 years of age, fathers, and grandmothers in each of the five communities. The discussion guides, developed by IFPRI, included three health and nutrition-related topics: prevention of anemia, health- and nutrition-related messages, and access to health services as well as perceptions and beliefs about these services.

Data collection

The data were collected by seven local, experienced fieldworkers who were fluent in both Spanish and Q'eqchi. All of the fieldworkers had prior experience working in Alta Verapaz and most had experience with collecting health- and nutrition-related information. The data collection team participated in an intensive week-long training, with four of the team members focusing on the semi-structured interviews and focus group discussions with community members and the other three focusing on the general survey, the health facility assessments at the CCs, and the key informant interviews with members of the EBS. Based on prior experience in the area, the interviews and interview guides that were used with the community members were taught to the team in Spanish and then the team worked together to agree on

the translations into Q'eqchi; selected translations were then validated with verbal back-translations. During the training period, all of the instruments were initially tested and adjustments made as necessary.

The semi-structured interviews, focus group discussions, and general surveys with the community members were all conducted in Q'eqchi, while the key informant interviews and health facility assessments were conducted in Spanish. The interviews were recorded at the time of the interview and the interviews and focus group discussions that were conducted in Q'eqchi were then translated and re-recorded in Spanish by the person who conducted the interview as soon as possible following the interview. These Spanish recordings were later transcribed and the Spanish transcriptions were used for analysis.

Data analysis

The data collected in the general survey and health facility assessments were analyzed using SPSS version 18. Analyses of the general survey were conducted for the group of mothers as a whole and then separately for each group of mothers (pregnant women and mothers with children under 6 months of age, mothers of children 6–11 months of age, and mothers with children 12–23 months of age). Health facility assessments were analyzed by CC and for all five CCs visited.

Qualitative data analysis software (Nvivo) was used to analyze the semi-structured interviews, focus group discussions, and key informant interviews. Two code lists were created according to the topics of interest: one for the semi-structured interviews and focus group discussions and another for the key informant interviews. The transcripts from each of the semi-structured interviews, focus group discussions, and key informant interviews were then coded in Nvivo according to these code lists. Finally, all of the coded transcript material was read and written up within a framework of the key, overarching issues addressed in the formative research, organized around engaging specific subthemes that arose out of the coding process.

2.3. Results

Supply side

Facilities and supplies

Due to the timing of the study, one of the five CCs was not visited on the one day per month the CC was open and another only had one health staff member present—the FI—to give vaccines on the day that the CC was visited. Therefore it was only possible to assess the presence of health personnel at three of the four CCs and of equipment and supplies at four of the five CCs.

Among the three CCs that were open and fully functioning when visited, two were fully staffed. In the other CC, the FI and the nutrition educator were absent at the time of the visit (**Table 2.2**). The availability of basic equipment and supplies that should be available at the CCs varied, with all CCs having serious deficiencies in at least one area ("–" entries in Table 2.2 mean absent or unavailable). However, one CC clearly had less equipment and supplies available in all of the major categories than the other three. It is possible that this was related to the timing of the visit. Though none of the CCs had all of the basic medications available, the majority had six of the seven medications on hand, with most lacking treatment for malaria. All CCs had oral rehydration solution (ORS) and an antihelminth on hand, and most had antibiotics and aspirin, as well. Availability of MN supplements varied; two of the CCs had all of the recommended supplements on hand (iron, folic acid, vitamin A, and MNP), one had only MNP, and one had only iron and folic acid. None of the CCs had zinc tablets on hand. In the most recent published norms, zinc is recommended for children that are stunted and for the treatment of diarrhea [12]; however, it is unclear if the MSPAS was distributing or recommending the use of zinc supplements at the

time of the assessment. None of the CCs had clean water or transportation available for emergency use. On average, the closest transport was estimated to be about 20 minutes from the CCs.

Table 2.2. Availability of staff, equipment, and supplies on the day of the visit, by CC

	CC1	CC2	CC3	CC4
Medical staff (all)	–	**Yes**	–	**Yes**
1. Doctor or nurse[a]	Yes	Yes	–	Yes
2. Midwife	Yes	Yes	–	Yes
3. Institutional facilitator (FI)	–	Yes	Yes	Yes
4. Community facilitator (FC)	Yes	Yes	–	Yes
5. Community health worker (CHW)	Yes	Yes	–	Yes
6. Nutrition educator	–	Yes	–	Yes
Equipment and supplies (all)	–	–	–	–
1. Potable water	–	–	–	–
2. Emergency transportation	–	–	–	–
Equipment and supplies (all)	–	–	–	**Yes**
1. Scale (adult)	Yes	–	Yes	Yes
2. Scale (child)	Yes	Yes	Yes	Yes
3. Blood pressure monitor	–	Yes	–	Yes
4. Sterile syringes	Yes	Yes	Yes	Yes
5. Cold storage for vaccines	–	Yes	Yes	Yes
6. Record of medications	Yes	Yes	Yes	Yes
7. Vaccination cards	Yes	Yes	Yes	Yes
8. Education materials	Yes	–	–	Yes
9. Medical records or AIEPI/AIM-C[b] forms	–	Yes	Yes	Yes
Other hygiene-related supplies (all)	–	–	–	–
1. Cotton	Yes	Yes	–	Yes
2. Soap	Yes	–	–	–
3. Disinfectant	–	–	–	Yes
4. Gloves	Yes	–	–	Yes
Vaccines (all)	–	**Yes**	–	–
1. Bacillus Calmette-Guerin (BCG)	–	Yes	Yes	Yes
2. Oral polio vaccine (OPV)	Yes	Yes	Yes	–
3. Diphtheria, pertussis, and tetanus (DPT)	Yes	Yes	Yes	Yes
4. Measles, mumps, and rubella (MMR)	Yes	Yes	Yes	–
5. Tetanus Toxoid (TT)	–	Yes	–	–
Medications (all)	–	–	–	–
1. ORS	Yes	Yes	Yes	Yes
2. Amoxicillin	Yes	Yes	–	Yes
3. Trimetroprim-Sulfametoxazole	Yes	Yes	–	Yes
4. Other antibiotic	Yes	–	–	Yes
5. Anti-malarial medication	–	Yes	–	–
6. Albendazole or Mebendazole	Yes	Yes	Yes	Yes
7. Aspirin or Acetaminophen	Yes	Yes	–	Yes
Micronutrient supplements (all)	**Yes**	–	–	**Yes**
1. Iron	Yes	Yes	–	Yes
2. Folic acid	Yes	Yes	–	Yes
3. Vitamin A	Yes	–	–	Yes
4. Micronutrient powder (MNP)	Yes	–	Yes	Yes
5. Zinc supplements[b]	–	–	–	–

Note: "–" represents not available.

[a] In all CCs visited, nurses, not doctors were present.

[b] AIEPI/AINM-C stand for the Guatemala-based programs La Atención Integrada a las Enfermedades Prevalentes de la Infancia/ Atención Integral de la Niñez y la Mujer a Nivel Comunitario (Integrated Care of Prevalent Childhood Illness/Integrated Health Care for Women and Children in Communities).

[b] Zinc supplements are recommended in the most recent published norms for children that are stunted, and for the treatment of diarrhea. It is unclear if the MSPAS was distributing or recommending the use of zinc supplements at the time of the assessment.

EBS staff background, trainings received, and health- and nutrition-related knowledge

Education and background

The level of education of EBS staff varied greatly, as would be expected. Within our sample, the highest staff member was always a nurse; there were no doctors associated with any of the CCs that we visited. All of the nurses had trained to become professional nurses and all had previous work experience in this field. Four of the five FIs had received a Bachelor's Degree in Science and Letters, while one had only completed 3rd basic (which is equivalent to completing junior high). All of the FIs had prior work experience. However, the type of experience varied from working with other NGOs to teaching to work on farms. The nutrition educators had a variety of educational backgrounds: one had been trained as a nurse, one had received a Bachelor's Degree in Science and Letters, one trained to be a teacher, and one had reached sixth grade. All of the FCs had completed at least some primary school (third and fifth grade), and two had completed some further schooling (2nd and 3rd basic). Only two of the five midwives had completed any schooling (2nd and 3rd primary), and only one had worked prior to becoming a midwife (helping make breakfast at a local school). Four of the five CHWs had completed 6th primary and one 2nd primary. Two had prior work experience, but neither had experience in the fields of health or nutrition.

Trainings received through the MSPAS and NGOs

Trainings for health staff were conducted by the MSPAS and the implementing NGOs. In general, nurses, FIs, and nutrition educators received training directly from the MSPAS, and the FCs and CHWs received their training from the implementing NGOs. The midwives were split, with two of the five receiving the majority of their training from the MSPAS, whereas the other three received theirs from their respective NGOs.

Nearly all of FIs, nutrition educators, FCs, and midwives reported having received at least some training in the last year, while only three of the five nurses and CHWs received any training. In general, the trainings for the nurses, nutrition educators, and midwives seemed to have covered the greatest variety of topics, while the FIs reported that their trainings focused on the detection and treatment of malnourished children, complementary feeding, care and feeding during illness, and family planning.

The majority of EBS health staff reported that they had received some training in complementary feeding within the last year. Some received training about the prevention of illnesses and breastfeeding, while none mentioned having received any training related to anemia (**Table 2.3**). Some of the other topics that health workers received training on related to diet during pregnancy and lactation, detection and treatment of severely malnourished children, feeding during illness, and family planning.

Table 2.3. Health and nutrition topics for which health workers have received training, by position[a]

	n	Breastfeeding	Complementary feeding	Anemia	Prevention of illness (including hygiene)
Nurse	5	2	2	0	0
FI	5	0	3	0	0
Nutrition educator	4	3	4	0	2
FC	5	3	3	0	3
Midwives	5	4	5	0	3
CHWs	5	0	2	0	3
All	29	12	19	0	11

[a] Shaded cells represent topics for which at least 50 percent of respondents reported having received training.

Overall, the majority of those who participated in the trainings understood and appreciated the trainings, though one of the three CHWs reported understanding very little of the training, since it was conducted in Spanish, which she does not understand well. Others also stated some limitations in understanding due to the trainings being conducted in Spanish (especially among the FCs, midwives, and CHWs) and suggested that the trainings be conducted in Q'eqchi. Most suggested that trainers use more audiovisual materials and participatory methods, including role playing and food preparation, to further facilitate understanding of the lessons, especially among those who cannot read. In addition, many people requested that they be given illustrated materials depicting the different lessons to help them remember the lessons and to share with community members when they are teaching them about the topics they have learned. One of the nurses suggested that the entire team be invited to the trainings, since they currently receive different trainings and he thought it would be better if they were all learning the same things. One of the CHWs suggested that trainings be held for the whole community, so that they could also learn what they are being taught.

Some of the health staff requested more frequent trainings and longer trainings on some of the topics. They felt that topics were too general in some cases and were covered much too quickly for them to be able to understand and remember everything that was taught in some of the training sessions. Some of the topics that the nutrition educators, FIs, FCs, and midwives wanted more training on include the care and feeding of malnourished children, complementary feeding, the proper use of MN supplements, and the prevention and treatment of common illnesses. Most of the CHWs wanted more training in general, but did not mention any specific topics. The nurses requested additional trainings related to how to give pregnant women emergency care during childbirth, preventable illnesses, diet during pregnancy, sexually transmitted diseases, traditional medicines, and complementary feeding (what age to begin and what foods to give children). One of the nurses stated that they learn a lot about how to treat severely malnourished children, but not how to care for other (non-malnourished) children that are the majority of the population.

The vast majority of the health staff (22 of the 29) felt that they have not received sufficient training and support to do their jobs and that they still have a lot to learn. For some the scenario was even worse. As explained by one CHW, "I have not received any training, this is what I want—to receive training so that I can teach the children in our community about health." In general, those who had prior experience in the health field felt that they had received enough training and support, while those who were new to the health sector did not.

Health worker knowledge of health- and nutrition-related issues and the MSPAS recommendations for provision of preventive care

Pregnant women

MSPAS recommendations. The MSPAS recommendations for the main components of preventive health care for pregnant women are summarized in **Table 2.4**. The MSPAS also recommends that women receive a tetanus vaccine if necessary and that they either give birth at an appropriate health center or are attended by a midwife during birth. In addition, the MSPAS recommends that pregnant women be educated about a number of health- and nutrition-related topics, including such things as diet during pregnancy, early initiation of breastfeeding, exclusive breastfeeding (EBF) for the first 6 months, use of iron and folic acid (IFA) supplements during pregnancy, danger signs during pregnancy, and family planning, among others.

Table 2.4. MSPAS recommendations for three components of preventive health care for pregnant women

Preventive health visits	Primary activities during preventive health visits	MN supplements
Four prenatal visits at 12, 26, 32, and 36–38 weeks (previous recommendation was at least three prenatal visits)	Measure blood pressure, temperature, pulse and respiration, weight and height, and check for signs of anemia Measure gestational age, monitor fetal heart rate and movements Detect danger signs and refer (i.e., in cases of hemorrhage, severe headache, fever, blurred vision, high blood pressure, severe abdominal pain, difficulty breathing, or convulsions)	**IFA: 2 doses of iron and 1 of folic acid every 8 days:** Pregnant women: Ferrous sulfate tablets (300 mg) and 1 folic acid tablet (5 mg)

Health worker knowledge. Health worker knowledge of these recommendations is illustrated in **Table 2.5**. Health workers were counted as having a good understanding of the recommendations if they stated that pregnant women should attend three or four prenatal visits, correctly mentioned at least three danger signs, and correctly mentioned that iron and/or folic acid supplements should be used during pregnancy.

Table 2.5. Health workers' knowledge of MSPAS recommendations for preventive health care during pregnancy, by position[a]

				Use of MN supplements	
	n	Prenatal visits	Danger signs	Iron	Folic acid
Nurses	5	5	5	5	5
FIs	5	5	4	4	4
Nutrition educators	4	4	4	4	4
FCs	5	0	3	5	5
Midwives	5	0	1	2	2
CHWs	5	0	0	0	1
All	29	14	17	20	21

[a] Shaded cells represent topics for which at least 50 percent of respondents had a good understanding of the recommendations.

In general, the nurses, FIs, and nutrition educators understand the MSPAS recommendations for preventive health care for pregnant women. The majority of them stated that women should go to the CC three or four times during pregnancy for a consult, to check for danger signs, and to receive MN supplements (Table 2.5). In addition, nearly all of them correctly identified at least three danger signs during pregnancy and that women should take IFA supplements during pregnancy. Most of these health workers also knew the correct frequency and duration of use of IFA supplements during pregnancy. Aside from the specific number of prenatal visits, the FCs' knowledge about the MSPAS recommendations during pregnancy was also generally good. The majority of them correctly identified three danger signs and all of them stated that women should take IFA supplements during pregnancy. Very few of the midwives or CHWs, however, reported any correct knowledge about these recommendations. Only two of the five CHWs stated having any knowledge of the MSPAS recommendations that women should go for regular health consults during pregnancy. Most did at least state that pregnant women should go to the CC for regular consults, recognize hemorrhage as a danger sign during pregnancy and birth, and state that women should take MN supplements during pregnancy, though they did not generally know which ones or for how long women should take them. A few also correctly stated that women should be attended by

midwives to ensure that there are no problems during birth and to help with referring them for further care in case of an emergency.

Most of the health staff believe that mothers go to their health consultations because they know it is important to attend these consultations based on information provided by the midwives and through announcements in the communities, they want to protect their pregnancy and avoid problems, and they want to receive the incentive offered by *Mi Familia Progresa*[4] (reported in two of the communities). One of the health staff stated that women did not used to come for their prenatal visits, but now they are starting to because of *Mi Familia Progresa*. Only two of the interviewees thought that mothers did not follow the recommendations and stated that women often fail to come to prenatal services until very late in their pregnancy, sometimes because they do not even realize that they are pregnant.

Women 0–6 months postpartum

MSPAS recommendations. The MSPAS recommendations for the main components of preventive health care for women who have recently given birth are summarized in **Table 2.6**. The MSPAS also recommends that women receive tetanus vaccine if necessary and be educated about a number of health- and nutrition-related topics, including early initiation of breastfeeding and EBF for 6 months, diet during lactation with a specific recommendation to eat three meals and two snacks per day, use of MN supplements, the importance of postpartum visits and visits for the newborn, and the promotion of birth spacing, among others.

Table 2.6. Preventive health care norms for women 0–6 months postpartum

Preventive health visits	Primary activities during preventive health visits	MN supplements
Home visit from a doctor or nurse 15–40 days after birth Additional visits as needed from the midwife or nurse	Check for danger signs and referral if necessary (i.e., hemorrhage, fever, difficulty breathing, severe abdominal pain, convulsions) Assess any emotional problems (psychosis and depression) and provide referral if necessary Test for cervical cancer at 40 days postpartum if not done earlier	**IFA: 2 doses of iron and 1 of folic acid every 8 days (for 6 months after birth):** Women postpartum: Ferrous sulfate tablets (300 mg) and 1 folic acid tablet (5 mg)

Health worker knowledge. Health worker knowledge of these recommendations is presented in **Table 2.7**. Health workers were counted as having a good understanding of the recommendations if they mentioned that women should be visited within the first 40 days after birth and use iron and/or folic acid and if they could list at least two danger signs.

[4] *Mi Familia Progresa* was a conditional cash transfer program implemented in priority areas by the Government of Guatemala starting in 2008. Eligible families were provided with a monthly payment if they utilized health and education services as stipulated by the program. Prenatal care visits for pregnant women was one of the conditions on which the cash transfer was based.

Table 2.7. Health workers' knowledge of MSPAS recommendations for preventive health care for women during the first 6 months postpartum, by position[a]

				Use of MN supplements	
	n	Postnatal visits	Danger signs	Iron	Folic acid
Nurses	5	2	4	5	5
FIs	5	0	2	4	4
Nutrition educators	4	2	3	4	4
FCs	5	0	3	5	5
Midwives	5	1	0	2	2
CHWs	5	0	0	0	1
All	29	5	12	20	21

[a] Shaded cells represent topics for which at least 50 percent of respondents had a good understanding of the recommendations.

The health staff members who were interviewed were less familiar with the MSPAS recommendations for postnatal care than they were for prenatal care. Very few of the health workers correctly stated that the women should be visited within the first 40 days after birth, though many did mention that they should go for regular consults or be visited by a midwife to check for danger signs. Most of the health workers were also less familiar with postpartum danger signs than with pregnancy danger signs, though the majority correctly mentioned hemorrhage. Knowledge related to the use of IFA was more consistent, with the majority of nurses, FIs, nutrition educators, and FCs stating that women should use these after birth. The nurses and nutrition educators also reported the correct frequency of use for these supplements, whereas the FIs and FCs did not. The midwives and CHWs again showed little or no knowledge of any of the recommendations for women during the postnatal period. Though specific knowledge about the use of MN supplements varied, all of the health staff interviewed believed that women should receive MN supplements. Some of the most commonly reported reasons for this included to improve women's nutrition, to give them strength and "sufficient" milk for breastfeeding, to help them recover from hemorrhaging, to prevent anemia, and to support their children's development. Most of the health staff believed that women do follow these recommendations. Those who believe that women do not follow the recommendations gave the reasons for this that either the women did not know they are supposed to come because the midwife did not tell them (n = 3) or they did not have money. However, it was not clear from the interviews what the women would need money for, whether it was for transportation, recommended medications or supplements, or something else related to utilizing the available preventive health services.

Children under 2 years of age

MSPAS recommendations. The MSPAS recommendations for the main components of preventive health care for children under 2 years of age are summarized in **Table 2.8**. The MSPAS also recommends that children receive all of their vaccinations and that the parents of children be educated about a number of health- and nutrition-related topics, including such things as early initiation of breastfeeding and EBF for 6 months, appropriate complementary feeding practices including the regular use of animal-source food (ASF), the use of MN supplements, and the importance of optimal hygiene practices (personal, environmental, and in food preparation).

Table 2.8. MSPAS recommendations for preventive health care norms for children 0–23 months of age

Preventive health visits	Primary activities during preventive health visits	MN supplements
One visit 15–28 days after birth	Detection of danger signs and referral (e.g., difficulty breathing, convulsions, fever, unable to eat, diarrhea, very small, bleeding)	**IFA: 1 dose of each every 8 days:** Children 6–18 months: 5 ml of ferrous sulfate (200 mg) or 1 ml of pediatric drops (125 mg) and 1 tablet of folic acid (5 mg) Children 19–23 months: 8 ml of ferrous sulfate (200 mg) or 2 ml of pediatric drops (125 mg) and 1 tablet of folic acid (5 mg) **OR** **MNP: 1 packet every day (60 packets every 6 months)**
Two general check-ups for children 1–11 months of age and one for children 12–23 months	Physical exam and evaluation of psychomotor development	
Monthly growth monitoring	Check for danger signs (e.g., child does not eat or drink, severe vomiting, convulsions, lethargic or unconscious, difficulty breathing, severe persistent diarrhea, dehydration, fever)	**Vitamin A: 1 dose every 6 months:** Children 6–11 months: 100,000 IU Children 12–23 months of age: 200,000 IU
	Check for other signs of illness, signs of violence, vital signs, growth, psychomotor development, anemia, dental and skin problems	**Zinc for stunted children: 1 dose every day for 90 days:** Children 2–5 months: ½ tablet (20 mg) Children 6–24 months: 1 tablet of (20 mg)
	Check immunization card and give vaccinations and MN supplements as needed	**Zinc for the treatment of diarrhea: 1 dose every day for 10 days:** Children 2–5 months: ½ tablet (20 mg) Children 6–24 months of age: 1 tablet (20 mg)

Health worker knowledge. Health worker knowledge of the MSPAS recommendations for children 0–23 months of age is presented in **Table 2.9**. Health workers were counted as having a good understanding of the recommendations if they mentioned the recommended one health visit for neonates within the first 28 days; regular or monthly attendance at preventive health visits, or growth monitoring visits for children 1–23 months of age; at least two danger signs; and correctly described the use of iron, folic acid, vitamin A, or MNPs for children 6–23 months of age.

Table 2.9. Health workers' knowledge of MSPAS recommendations for preventive health for children under 2 years of age, by position[a]

		Preventive health visits		Danger signs		Use of MN supplements			
	n	Neonatal	Under 2 years	Neonatal	Under 2 years	Iron	Folic acid	Vitamin A	MNPs
Nurses	5	3	5	4	5	5	5	3	4
FIs	5	3	2	1	5	5	5	4	3
Nutrition educators	4	4	0	2	3	3	2	1	4
FCs	5	2	2	3	4	4	4	3	1
Midwives	5	1	1	1	0	2	2	2	1
CHWs	5	1	2	1	0	0	1	0	0
All	29	8	7	12	17	19	19	13	13

[a] Shaded cells represent topics for which at least 50 percent of respondents had a good understanding of the recommendations.

In the semi-structured interviews, health workers were asked when children should be brought to the CC according to the MSPAS recommendations. In response, the majority of the nurses, FIs, and nutrition educators stated that children should be brought to the CC within 28 days after birth to receive their first Bacillus Calmette-Guerin (BCG) vaccine; a few of the other health workers also mentioned this. In addition to this recommendation, some of the health workers mentioned that children should be brought to the CC regularly, every month, or all the time for consults, growth monitoring, and to receive vaccines and MN supplements. A few stated that children should be brought to the CC when they are sick. Overall, the health staff interviewed believed that parents should and actually do take their children to the CCs for regular consultations. The few health staff that thought parents do not follow these recommendations said that parents are either too busy working, do not recognize the importance of their children's development, or do not know or remember the recommendations.

In general, the higher-level health workers were familiar with the danger signs for children under 2 years of age and correctly identified at least two of the primary danger signs. However, none of the CHWs or midwives correctly identified two of these danger signs. Likewise, midwives and CHWs were unfamiliar with neonatal danger signs. FIs were also less familiar with these than with the danger signs for children under 2 years of age.

Only one of the CHWs stated that children under 2 years of age should not take MN supplements because they were still breastfeeding. All of the other health workers believed that not only should children take MN supplements, but that they are very important for children's growth and development and the prevention of illnesses. The supplements that they believe should be given to children include *Chispitas* (a MNP that contains iron, zinc, vitamin A, vitamin C, and folic acid) (or *Macrovital*, the new name for *Chispitas*), iron, folic acid, and vitamin A.

The nurses and FIs generally had a good understanding of which supplements children should take, the correct frequency and dose, the fact that children should start receiving these supplements at 6 months of age, and that IFA are not necessary and should not be given if *Chispitas* are available, since they contain these MNs. All of the nutrition educators correctly stated that children should be given *Chispitas* every day for 2 months at every 6 month mark. One nutrition educator additionally mentioned that children should receive vitamin A every 6 months and zinc for the treatment of diarrhea. The FCs had varying degrees of knowledge about which supplements children should take or the correct dose and frequency of use. One mentioned iron, folic acid, and vitamin A with the correct frequencies, but then mentioned that *Chispitas* should be given every day with every meal, which is incorrect. Others mentioned starting some combination of vitamin A, iron, and folic acid at 6 months of age, and one stated that all three should be given twice a week (Tuesdays and Thursdays) every 3 months. The midwives and CHWs had limited knowledge about what supplements children should take; one midwife mentioned *Chispitas*, but did not know when children should start taking them or how often they should take them. One midwife mentioned vitamin A, two midwives and one CHW mentioned folic acid, and one midwife thought the supplements were only given to underweight children. The other midwives and CHWs did not know which MNs children should receive.

Breastfeeding, complementary feeding, anemia, and diarrhea

MSPAS recommendations. The MSPAS recommends that a number of health- and nutrition-related topics be taught to community members, especially parents (see **Box 2.1** for selected topics) [12]. The topics recommended vary slightly for different groups; for instance, an emphasis on the promotion of EBF and diet during pregnancy is recommended for families with pregnant women, whereas an emphasis on continued breastfeeding until 2 years of age and the initiation of complementary feeding at 6 months of age is recommended for parents of young children. Topics related to the prevention of illness, on the other hand, are the same for all groups.

Box 2.1. Health and nutrition education topics recommended by the MSPAS

1. For the growth and physical and mental development of children
    a. Promotion of EBF until 6 months of age
    b. Complementary feeding beginning at 6 months of age
    c. Continued breastfeeding until 2 years of age
    d. Supplementation with vitamin A, iron, folic acid, and zinc
    e. Affection, play, and conversation
2. To prevent illnesses
    a. Complete vaccinations
    b. Clean environment, potable water, and hand washing
    c. Sleeping under a mosquito net
    d. Protecting for HIV
3. For home care
    a. Increase foods and liquids during illness
    b. Proper care and treatment of illnesses
    c. Protect from abuse, neglect, injuries, and accidents
4. Seeking care outside of the home
    a. Recognition of danger signs
    b. Seek timely help and follow the advice of health personnel
5. Promotion of protective factors for children
    a. Breastfeeding
    b. Other care practices

Health worker knowledge. Overall, health workers had good specific knowledge about the recommendations for the timing of initiation of breastfeeding, the duration of EBF, the timing of introduction of complementary foods, and the prevention and treatment of diarrhea. In addition, the majority recognized paleness as one of the primary symptoms of anemia. However, very few of the health workers reported specific knowledge related to the prevention or treatment of anemia (**Table 2.10**).

Breastfeeding. With the exception of one nurse, all of the nurses, FIs, and nutrition educators explained that children should begin breastfeeding within 1 hour after birth and that they should be exclusively breastfed until they reach 6 months of age (Table 2.10). Only two of the FCs knew that children should begin breastfeeding within the first hour after birth, and only one noted that children should be exclusively breastfed for 6 months. However, all said that children should receive other foods beginning at 6 months of age. The five midwives reported different time intervals for mothers to initiate breastfeeding after birth: when the child asks, depending on when the mother's milk drops, after first bathing the child, within the first hour, and within the first half hour. The majority of midwives believe that children should be exclusively breastfed for 6 months. Three expressed that other foods and liquids can be given to the child at 6 months; one said at 1 year or 9 months and another at either 6 or 9 months. Most of the CHWs stated that children should be breastfed immediately after birth, but only two thought that children should be exclusively breastfed until 6 months of age. The others stated that children should be exclusively breastfed until 8 months of age, between 6 and 9 months of age, or until the mother is bored.

Table 2.10. Knowledge of health workers, by topic and position[a,b]

		Breastfeeding		Complementary feeding	Anemia			Diarrhea	
	n	Initiate within 1 hour of birth	EBF until 6 months	Initiate at 6 months of age	Symptoms	Prevention	Treatment with iron and/or folic acid	Prevention	Treatment with ORS
Nurses	5	4	5	5	5	1	3	5	5
FIs	5	5	5	5	4	2	3	2	3
Nutrition educators	4	4	4	4	3	1	1	2	2
FCs	5	2	1	5	3	0	1	5	4
Midwives	5	2	4	3	3	0	0	4	3
CHWs	5	4	2	2	3	0	0	3	1
All	29	21	20	24	21	4	8	21	18

[a] Health workers were counted has having a good understanding of the topics if they stated that breastfeeding should be initiated within 1 hour of birth, children should be exclusively breastfed until 6 months of age, and complementary feeding should begin at 6 months of age and mentioned at least one symptom of anemia, such as paleness or lethargy; the use of iron with or without folic acid or iron-rich foods for the prevention of anemia; the use of iron with or without folic acid for the treatment of anemia; good hygiene practices (personal, environmental, or food preparation) for the prevention of diarrhea; or ORS for the treatment of diarrhea.
[b] Shaded cells represent topics for which at least 50 percent of respondents answered correctly.

Complementary feeding. As most of the health personnel reported the importance of EBF until 6 months of age, they also reported that the introduction of other foods and liquids should begin at 6 months of age. However, the midwives and CHWs offered more varied opinions ranging from 4 months to 1 year, with only about half correctly stating 6 months of age as the appropriate time to begin introduction of liquids or foods other than breast milk.

In general, health personnel did not seem to have much information about what children 6–11 months of age should and should not be eating. The nurses and nutrition educators, however, seemed to have a better overall understanding of IYCF practices, compared with the FIs, FCs, midwives, and CHWs. In general, they recommended that children 0–6 months of age should be exclusively breastfed, children 7–9 months of age be given a variety of foods in puree form, and children 9–12 months of age start receiving small pieces of different types of foods, including such things as eggs, beans, rice, and tortillas. The majority of the other personnel focused on tortillas, porridge, or soups, though some mentioned beans and different types of meats, fruits, and vegetables. A number of the health staff interviewed mentioned that children 6–11 months of age should not be given hard foods, such as meat, because they cannot yet chew well. A few different people also mentioned that coffee, soda, fatty foods, citrus fruits, and chilies should be avoided in this age group. One of the nutrition educators also mentioned that juices made with untreated water (i.e., not boiled or chlorinated), which are commonly given in the communities, should not be consumed by children because they can cause diarrhea.

There was less confusion about which foods to give children 12–23 months of age. Most of the health personnel interviewed said that at this point the child should be receiving a little bit of everything or what the family eats, with many stating the importance of meat, beans, fruits and vegetables, and cheese. However, a few of the health personnel emphasized that watery foods, such as broths and soups are the best foods for children in this age group because they like them, they are not hard, and it is what they have to give their children. The only commonly mentioned food to avoid in this age group was coffee, with two each of the nurses, FIs, and FCs mentioning this.

Growth. Almost all of the health staff members understood the relationship between nutrition (complementary feeding and breastfeeding) and growth, stating that inadequate nutrition or breastfeeding inhibit growth and that good nutrition and breastfeeding promote growth. The nutrition educators emphasized the importance of EBF until 6 months of age, at which time complementary foods should be introduced. A few others mentioned specific food groups, such as vegetables and meat, as being particularly good for growth. One mentioned the importance of thin porridges. A number of the health staff also discussed the relationship between hygiene and growth, both in terms of personal hygiene and hygienic food preparation, again with inadequate practices leading to inhibition of growth and promising practices enhancing growth. This was especially prevalent in Panzós and Senahú. One of the nurses discussed the relationship between adequate nutrition, the prevention of illnesses through proper hygiene practices, and growth. Other factors that were mentioned in relation to child growth included inadequate care from parents, anemia, and parasites, which can inhibit growth, and the importance of MN supplements and attending regular health visits for growth monitoring in helping children to grow well.

Anemia. Twenty of the 29 health staff interviewed recognized paleness as a primary symptom of anemia. All of the nurses recognized paleness as a primary symptom, and three or four of each of the other health staff members mentioned this symptom. In one of the communities, only two of the health staff (the nurse and FI) mentioned paleness as a symptom of anemia, whereas the others either did not know or mentioned more general illness symptoms, such as nausea and fever. Some of the other most commonly mentioned symptoms included lethargy (n = 8), lack of appetite (n = 4), and anorexia (n = 3).

Most of the nurses, FIs, nutrition educators, and midwives discussed the relationship between inadequate nutrition and anemia and the fact that anemia could be prevented by eating nutrient-rich foods. Although one of the nurses and one of the nutrition educators mentioned the importance of iron-rich foods, none of the others mentioned any specific foods or food groups that are especially helpful. Most of the nurses and FIs and one of the nutrition educators also said that anemia could be prevented with the use of MN supplements, with a few specifically mentioning IFA. The FCs, midwives, and CHWs emphasized the importance of proper hygiene for the prevention of anemia, focusing on not letting children play in the dirt and regular hand washing.

All of the nurses and FIs think that anemia should be treated with MN supplements, with five of the 10 specifically mentioning IFA and one mentioning only iron. One nutrition educator and one FCs also mentioned IFA for the treatment of anemia, whereas others mentioned better nutrition and treatment or medicines from the health center. The majority of the personnel interviewed stated that if anemia is not treated in time, it can lead to death.

Most of the health staff said that they would allow a small vial of blood to be taken from themselves or their children to test for anemia, though some (two of each of the nurses and FIs, and one each of the nutrition educators and FCs) said they would not, since anemia can be detected by paleness and therefore the test is unnecessary. A few others said they would not, but did not give a reason.

Diarrhea. In general, the health personnel interviewed recognized the importance of proper hygiene for the prevention of diarrhea. In the words of one of the nurses, “household hygiene, personal hygiene, and

safe food preparation (i.e., washing foods and cooking them well) are the three things that prevent diarrhea." However, very few of the staff mentioned the importance of boiled or chlorinated water in the prevention of diarrhea. Some of the staff members mentioned that going to health consults and education is important for the prevention of diarrhea.

With the exception of the CHWs, the majority of health staff interviewed stated that diarrhea can be treated with ORS, either obtained from the CC or made at home. Some of the health staff also mentioned that diarrhea should be treated with medicine, and a few specifically mentioned that treatment depended on the type of diarrhea and that if it is severe, the child should be referred to medical care. One of the nutrition educators also mentioned that zinc should be used to treat diarrhea and another, that traditional medicines could be used. Of the CHWs, only one mentioned the use of ORS in the treatment of diarrhea; the others mentioned eating, maintaining cleanliness, and going to the CC. Almost all of the health staff reported that if diarrhea is severe and left untreated, it can lead to death.

Advice that health staff give to mothers and other members of the community

All of the EBS members are expected to give some advice and/or information related to the MSPAS health- and nutrition-related topics. The doctors or nurses should give advice during consults; FIs should give advice during growth monitoring sessions and while giving vaccinations and/or MN supplements. Advice regarding complementary feeding practices should be adjusted according to the nutritional status of the child. Midwives are tasked with providing advice to pregnant women and women who have just given birth regarding the care of pregnant women and the newborn. This advice should primarily be given in the home. The CHWs are expected to reinforce nutrition- and health-related advice and information that is provided by the other EBS members during regular home visits.

Pregnant women

The FIs, FCs, and nutrition educators were the staff members most commonly asked for advice about diet during pregnancy. A few of the nurses and midwives and one CHW also reported having been asked for advice. All have given related advice, explaining the importance of eating a variety of foods. The nurses emphasized the consumption of the four basic food groups (milk, meat, fruits and vegetables, and grains), and the nutrition educators, midwives, and FCs discussed the importance of fruits and vegetables and drinking enough water. The FCs and midwives also mentioned the importance of broths, soups, and *atoles* (a traditional drink made with corn flour) for good health of the mother and child. Some of the health staff also talked about advising pregnant women about the importance of taking MN supplements and going to the CC for regular health consults and seeking care if they have any danger signs, such as hemorrhaging. One CHW shared the following about the advice he gave:

> One time a pregnant woman asked me why she was so tired all the time and didn't want to eat. I told her that she should go to her health consult and I always say that she has to eat well so that she is strong, but I made her go to the doctor because he is the one that knows. I haven't studied much and don't have enough training and didn't know what else to say.

Most of the health staff who have been asked for advice believe that pregnant women follow their advice because they want to ensure their own health and that of the child. They also mentioned that women have limited knowledge about what constitutes a good diet during pregnancy, but are interested in this topic and thus follow the advice that they are given. A couple of the nutrition educators mentioned that sometimes women do not go to their health consults until very late in their pregnancies. Others do not notify the midwives when they are giving birth and thus are attended only by family members during and immediately following birth.

Lactating women

A similar pattern of advice seeking was seen in regards to diet during lactation; FIs, FCs, nutrition educators, and nurses were the people most commonly asked for advice. These staff members had given related advice, which covered the importance of consuming a variety of foods, including vitamin-rich foods, such as fruits and vegetables, and foods high in protein and energy and the need to eat more than usual and drink a lot of liquids in order to have "sufficient" breast milk. Some of the health staff stated variations on the general statement that "mothers have to eat well so that their children can eat well and grow." Only one midwife was asked for advice regarding diet during lactation, which she gave, echoing the common statement above: "women have to eat well and drink a lot in order to have 'sufficient' milk for their children." None of the CHWs have been asked for advice about diet during lactation. Those who gave advice believed that mothers follow the advice to make sure that they are healthy, strong, and able to produce "sufficient" breast milk to give their children so they are also healthy and strong. Again, the health staff noted that mothers do not seem to have much knowledge in this area and therefore welcome advice about this topic. Some noted that they know mothers follow this advice because they witness the advice being put into practice when they visit the mothers in their homes and because they see the children growing well.

Child feeding

The majority of the health staff, with the exception of the CHWs, had been asked for and had given advice on child feeding. The nurses had given advice on how to care for malnourished children, how to make sure that children get all four food groups (milk, meat, fruits and vegetables, and grains), and which foods from the earth (and/or available in the community) can be eaten, such as beans, eggs, and animals. The advice given by the FIs focused on the importance of EBF for the first 6 months, continued breastfeeding for the first few years of life, the use of MN supplements, and how to feed malnourished children. The nutrition educators tended to report more specific feeding advice, such as children 0–6 months of age should be exclusively breastfed, children 7–9 months of age should receive purees, and children 9–12 months of age should begin to receive small pieces of family foods. Advice given by the FCs emphasized the importance of hygiene, household, personal, and in the preparation of foods, and the consumption of *Incaparina*[5] and *hierbas*.[6] The midwives primarily gave advice related to breastfeeding practices, including how often to breastfeed and the importance of feeding on demand. They also advised about specific foods that are good for children and specifically mentioned *Incaparina*, fish, beans, and potatoes. None of the CHWs have been asked for advice, though one stated that he gives unsolicited advice.

In general, the health staff believe that the majority of parents follow this advice if they have the ability (economic means) to do so. Some of the nurses and FCs reported witnessing parents following advice during their home visits and noticing changes in their children. One of the health staff members stated that, in general, parents in their communities have been learning about the importance of children's health and nutrition and have started to pay more attention to these issues.

Child growth

As with the other topics, the majority of the health staff members were asked for advice about children's growth, with the exception of the CHWs. Most have given related advice and have discussed with caregivers the relationship between growth and nutrition and the importance of breastfeeding for growth, preventing illness through good hygiene, and taking children for medical attention when they are ill. The nurses and nutrition educators further commented on giving advice related to the use of MN supplements

[5] Incaparina is a fortified-blended food, originally developed in Guatemala. It is composed of corn and soy flour fortified with vitamins and minerals and is promoted for a variety of uses, including as a complementary food for young children (prepared as a porridge or drink), as well as for pregnant and lactating women (http://www.incaparina.com).
[6] *Hierbas* refer to herbs, root vegetables, and some leafy plants or greens.

to facilitate growth and the importance of growth monitoring to ensure that children are growing well and that the parents receive proper advice if children are not growing well.

Opinions about whether or not parents follow advice related to children's growth varied, with some stating that they think they do follow the advice because they see parents taking better care of their children, taking their children for health consults, and improving their household and personal hygiene. Furthermore, some stated that the presence of FCs in the communities helps to motivate parents, as the FCs talk with the parents regularly, check on the children's growth, and discuss any problems with the parents. However, others reported that parents do not follow their advice because many of them still do not take their children for regular health consults.

Prevention of illness

The nurses, FCs, and FIs are most commonly asked for advice related to the prevention of illness (four of five of each of the different staff members), followed by about half of the nutrition educators and midwives. The nurses, FIs, and FCs emphasized the importance of personal and household hygiene, safe preparation of foods, chlorinating and/or boiling water for consumption, and covering children when they are cold. One of the FIs also mentioned giving advice about the importance of colostrum for the prevention of illness, and the nurses further discussed the importance of receiving vaccinations to prevent illness. The nutrition educators and midwives primarily focused on the importance of hygiene, especially hand washing and taking the children for regular health consults. Again, none of the CHWs were asked for advice related to this topic.

Some of the health staff thought that parents have followed their advice related to the prevention of illness, while others do not. The nutrition educators, for example, had a variety of opinions about the uptake of advice related to the prevention of illness: one stated that she noticed cleaner houses during her more recent visits, another said that she thinks that households sometimes follow her advice, and yet another stated that people never follow her advice.

Job satisfaction

As mentioned earlier, the FCs, midwives, and CHWs are selected for their jobs by their communities, rather than seeking out the job themselves, and some indicated that they felt obligated to take the job due to this selection process. They are supposed to receive a small stipend for their work, but in some areas the positions are purely voluntary. The nurse, FI, and nutrition educator positions, on the other hand, are all paid positions. All of the nurses felt that their work is appreciated and they have chosen this job because they want to help people in the communities that they work in. Only one of the nurses stated that she wanted to leave her job after having spent 10 years working in the health field. The FIs interviewed were all satisfied with their jobs and did not express any desire to change their jobs, stating that they enjoyed their work with women and children and other members of the community and believed that their work is appreciated. Three of the FCs felt that their work is appreciated, while two indicated that they do not always feel that way. One FC specifically stated that he would like to change his job because he did not feel like the work is appreciated. Three of the four nutrition educators thought that their work is appreciated, but two of them wanted to change their jobs: one to make more money and one to work directly with patients. The other two did not express interest in changing jobs. Though all of the midwives felt that their work was appreciated by the community members, four out of five mentioned that they wanted a different job, stating that their work is tiring, takes time away from caring for their own households, and does not pay. Only two of the five CHWs thought that their work is appreciated, and two of them wanted to change jobs unless they were given additional training and a salary.

Opinion of SIAS

Overall, the health staff interviewed were positive about SIAS, with many emphasizing the benefit of having health services (including medicines, vaccines, and supplements) available within the communities and health care services available for women and children. Many stated that this is a substantial improvement from before, when there were no health care services available in the communities and members did not have the necessary resources to seek services from available health centers. Some thought that the quality and availability of services varies from community to community, with some NGOs providing more medicines at the CCs and better support for their health personnel than others.

In general, the health personnel thought that the system could be improved by implementing more health initiatives; having more health personnel, equipment, and supplies, including medicines, available in the communities; having a vehicle to use for emergencies; being able to visit the communities more frequently (as sometimes they run out of time to see everyone); having more training sessions, both for health staff and community members; having better materials for learning (for themselves) and for teaching community members; and by paying the FCs, midwives, and CHWs. This last point was mentioned not only by the unpaid workers themselves, but also by the nurses who probably perceived that giving financial incentives to CHWs would motivate them to provide greater support to the communities. Among the paid staff, there was an expressed request to be paid on time (delays of four to five months in receiving payments were reported). The nutrition educators emphasized that they need more time to train mothers, stating that their workload does not allow them to spend the necessary amount of time with mothers to make sure that they have understood all of the topics. A few of the health personnel also expressed that it would be helpful to expand services to reach other community members and that they would like additional and/or more comfortable CCs.

Demand side

To address the questions related to the demand side of health services, we used information from the general surveys, semi-structured interviews, and focus group discussions. The general surveys were conducted with pregnant women and women with children under 6 months of age, women with children 6–11 months of age, and women with children 12–23 months of age. The semi-structured interviews and focus groups discussions were conducted with pregnant women and women with children under 2 years of age as well as with grandmothers and fathers.

Health and nutrition-related knowledge

Danger signs

During pregnancy. More than half of the people interviewed (pregnant women, women with children 0–23 months of age, fathers, and grandmothers) did not know any of the danger signs to watch for during pregnancy. The others reported hemorrhaging, head pain, stomach pain, fever, and aborting as serious danger signs. Most of the people who correctly identified one or more of the danger signs reported having received some training on the subject from doctors, midwives, or CHWs. Grandmothers seemed to be as well informed on this topic as the mothers, but fathers were less informed. Many of the people interviewed stated that they would seek advice and care from a doctor or midwife or at a health facility if they experienced problems during pregnancy, while others stated that they were unsure of what to do if they experienced a problem. Some noted that problems could be avoided by attending regular health consults.

During birth. Again, many people interviewed were unsure of the danger signs during birth, but some explained that hemorrhaging, fainting, headache, a breech baby, or inability to deliver could signal serious problems. If they experienced complications during birth, the majority of people explained that they

would seek help from a midwife, FC, or a doctor or go to a health center, though this would depend on the availability of transportation. In some communities, ambulances could be called, but in others mothers would have to wait for a bus and/or have sufficient funds to pay for other transportation. Close to one half of the people interviewed thought that complications could be resolved by the midwife in their communities. Fathers, grandmothers, and pregnant women or those who had recently given birth were least likely to think that complications could be resolved within their communities and most would seek outside help, though money for transportation was a commonly stated barrier. One grandmother in Senahú recounted how her daughter-in-law had died from complications during birth:

> It is that one can't find transportation, it costs to find it and that's what happened to my daughter-in-law who died a month ago when she was gravely ill. She became very sick during birth, we waved down a truck to take her and it brought her to town, but the men that were there, they sat there, waiting for a nurse to come to take her out, and who could take her out, only we were there, until my brother said to the men, "they already went to see a woman who is dying." Thus, once they arrived my granddaughter had already become extremely tired and because of this she died in birth, a month ago we buried her because of problems or complications with birth.

Postnatal. Most mothers, fathers, and grandmothers did not know how to recognize danger signs after birth, though a few mentioned hemorrhaging, fever, headache, extreme fatigue, and becoming very pale as possible signs. Most people that mentioned any symptoms only mentioned one or two.

Children under 5 years of age. The majority of people interviewed explained that they know that a child is ill if he or she cries a lot; does not want to do anything; shows obvious symptoms of illness such as mucus, fever, and vomiting; or does not have an appetite. Many stated that they know children are seriously ill when he or she will not get out of bed, eat, drink water, or nurse or has trouble breathing. When a child is sick, parents and grandmothers believe that they should be taken to a health center, most to the CC, to receive medicine. Mothers would consult health staff in the CC, a traditional healer, the CHW, or other community members if they felt unsure of what to do for a sick child.

Micronutrient supplements

During pregnancy. Nearly all of the people interviewed emphasized that women should take supplements during pregnancy, although only a few stated any specific reasons regarding why they should take them. Those that did express specific ideas primarily emphasized the importance of these supplements for ensuring the woman's health and strength during pregnancy, as well as ensuring the health of the child. A few of the fathers stated that they did not think their wives used these supplements because the fathers did not know why they should. Some of the grandmothers expressed support for this practice, explaining that while supplements were not available when they were pregnant, they have now become more necessary as people have less access to nutritious foods in their communities. However, a few of the grandmothers also expressed great concern about the use of iron supplements during pregnancy, as they believe they can cause abortion.

Postpartum. In general, people were very supportive of the use of MN supplements during lactation, with some specifically mentioning the importance of iron, which is in accordance with the MSPAS recommendations. Most people that discussed any specific reasons to use these supplements during lactation stated that they help women to gain strength and ensure their health. Although people were generally supportive of the use of MN supplements during lactation, most expressed uncertainty about the benefits of these supplements and that they would like more information about why they should take them, as well as specific information regarding what to take, when, and how often. A few of the fathers expressed frustration concerning the lack of availability of the supplements and stated that their wives did not receive enough of these supplements.

Children under 2 years of age. Knowledge about supplements and fortified products varied, depending on the type of supplement/product and group interviewed. In interviews and focus group discussions, we found that knowledge varied, with some having no knowledge of the different supplements or why they should be given, while the great majority expressed a general willingness to give vitamins and minerals for the health and strength of their children. Knowledge of vitamin A compared to other micronutrients is more widespread. Many stated that vitamin A was important for the growth, strength, and the general well-being of children. Some fathers expressed frustration with the frequency with which this supplement is given, stating that it depends on the availability at the CC. Most mothers and fathers also expressed familiarity with iron tablets; however, most grandmothers had not heard about them. Mothers and fathers explained that iron supplements give their children strength and a few mentioned that these supplements increase the blood in the body. Similarly, about half of the people interviewed had heard of *Chispitas*. Mothers of children 12–23 months of age seemed to be the most familiar with *Chispitas* and stated that they help with the growth of children. A few mothers reported other specific benefits of *Chispitas*. In a focus group, they explained that *Chispitas* can help strengthen bones, and another explained that *Chispitas* helped her child to begin eating. Some of the mothers, fathers, and grandmothers were also knowledgeable of how *Chispitas* should be given, as they described putting *Chispitas* in a mixture of bananas or rice to feed them to children. Giving children fortified products depended on access (specifically, if the products were distributed in the CCs). Many parents also reported giving *Incaparina*—held in high regard across the communities—to children, when they had enough money to buy it.

By contrast, there was little to no knowledge of zinc or *Vitacereal*[7] in the study communities. As stated above, mothers, fathers, and grandmothers expressed an overwhelming willingness to give their children supplements and fortified products; however, they need to receive them from the CC or other community health services, as cost and (related) access are significant barriers to their use. Additionally, willingness to give vitamins and minerals in these communities was linked to receiving advice from trusted medical sources, specifically trainings, midwives, and health workers in general, about the use and benefits of these supplements. As explained by one mother, "I think that it would depend on the health workers, if they advised me to give [them] vitamins, I would give them."

Anemia

While many people had heard of anemia and some stated that it causes paleness and/or is related to a lack of blood in the body, most did not understand its causes or how to prevent it. A few people interviewed explained that anemia relates to vitamin deficiency, and a few others noted that it can be prevented or treated with vitamins. One mother specifically mentioned that it is related to a lack of iron. However, the majority of people that stated a cause of anemia or method of prevention focused on hygiene. This was noted by one mother: "Keeping them clean and healthy so that they do not become ill." Only four of the 50 people who participated in the semi-structured interviews reported having received any advice or training on this subject.

The vast majority of women who participated in the general survey (93 percent [112/120]) said that they would be willing to let their children give a drop of blood to test for anemia.

Diarrhea

The understanding of diarrhea was far greater than that of anemia. Most of the people interviewed understood the relationship between hygiene and diarrhea, explaining that lack of hygiene is the primary cause of diarrhea and that it is necessary to have good personal and household hygiene to prevent diarrhea

[7] *Vitacereal* was created in Guatemala. It is a blended food made with maize and soy flour, fortified with vitamins and minerals. It is intended to be used by children 6−35 months of age and pregnant and lactating women living in municipalities in Guatemala with high prevalences of stunting (http://documents.wfp.org/stellent/groups/public/documents/liaison_offices/wfp198431.pdf).

and emphasizing the importance of washing hands before meals. A few people also expressed concern that not feeding children on a schedule could cause diarrhea.

The majority of people reported buying medicine when their child had diarrhea. A few people also stated that they used natural remedies, including such things as orange juice, garlic, and burned tortilla with coffee, to treat diarrhea. Some mothers said they brought their children to a health post. Many of the people interviewed were familiar with ORS and reported that they were either willing to give or had given it to their children to treat diarrhea. Many mothers also explained that they continued to breastfeed a child who had diarrhea and brought the children to a medical center. Though most people seemed to be familiar with the causes and prevention of diarrhea, very few expressed knowledge of dehydration. The most common sources of information about diarrhea were doctors, nurses, and health workers in their communities, as well as training at the CCs.

Prevention of illness

While some people were uncertain about the reasons why children get ill, others explained that insufficient nutrition, bad hygiene, and inadequate care can cause illness. They believe that improving nutrition (giving special foods, including vitamin-rich foods, fruits, *macuy*,[8] soup, and water), keeping children clean, and giving children vitamins or medicine can help to alleviate illness. Most people explained that they would consult health workers in the community (FCs, midwives, and CHWs) or doctors at the CCs if they did not know what to do when their child became ill. Additionally, women would ask their husbands for advice and men would ask other family members for help.

Growth

Many parents and grandmothers had a general understanding of the determinants of good health and child growth, stating that good nutrition (including breastfeeding young children), proper hygiene, and prevention of illness are important for the health and growth of their children. In addition, some mentioned the importance of attending their regular health consults, taking vitamins, and giving children medicines and/or seeking medical care when they are ill.

Use of services

Preventive health visits

Prenatal care. Almost all women (about 90 percent) who participated in the general survey reported that they had attended three or more prenatal visits during pregnancy (**Table 2.11**). The lower percentage (80 percent) in the group of pregnant women and women with children under 6 months is due to some women not having completed their pregnancy yet. Participants in the semi-structured interviews reported that most women receive prenatal care either from a midwife or doctor at the CC, although, in some cases, women are visited in their homes for these visits.

Table 2.11. Number and percentage of women who attended three or more prenatal visits

Group	n	Attended three or more prenatal visits n (%)
Pregnant women and women with children under 6 months of age	40	32 (80)
Mothers with children 6–11 months of age	40	36 (90)
Mothers with children 12–23 months of age	40	36 (90)
Total	120	104 (87)

[8] *Macuy* is a tuber grown in Guatemala. People eat both the tuber and the green leaves of the tuber.

Mothers reported that their health and that of their fetus was checked during prenatal visits. Some women reported having received vaccinations, with some specifically mentioning tetanus vaccination, though most women did not know which vaccinations they had received. Women also reported having received vitamins or folic acid during prenatal visits, but mentioned that this depended on availability at the CC at the time of their visit. Overall, mothers, fathers, and grandmothers were positive about prenatal care, stating that it is important for women to attend these consults to ensure their health and that of their child and to avoid complications during pregnancy. One commonly stated concern regarding prenatal visits was not having health staff available every day, but rather only sporadically. In addition, one mother also mentioned that she did not attend prenatal visits because she did not want to and did not think she had enough money to attend these types of visits. Some fathers mentioned that women need sufficient strength to walk to the CC to attend these visits.

Giving birth at home was far more common (61 percent) than giving birth at a medical facility (**Table 2.12**). Ideally, home deliveries would at least be attended by an experienced midwife from the community, but many people reported that women are only attended by their family members. The results suggest that more mothers delivered at the hospital or at a health center among the group of recent pregnant women (48 percent among mothers of children 6–11 months of age) compared to mothers of children in their second year (28 percent). It would be interesting to find out whether this is a general trend in the region related to an increase in access to hospital and health centers over the past few years. Regarding assistance with home births, some grandmothers specifically requested receiving some training about how to help mothers give birth and how to deal with complications associated with at-home births.

Table 2.12. Number and percentage of women who gave birth at the hospital, at a health center, or at home

Group	n	Hospital n (%)	Health Center n (%)	Home n (%)
Pregnant women and women with children under 6 months of age	29	8 (26)	4 (14)	17 (59)
Mothers with children 6–11 months of age	40	12 (30)	7 (18)	21 (53)
Mothers with children 12–23 months of age	40	8 (20)	3 (8)	29 (73)
Total	120	28 (23)	14 (13)	67 (61)

Postnatal care. A little more than half of the mothers reported having received postnatal care. Most of these mothers received the first postnatal visit within the first 5 days of birth, though some did not receive care for up to 2 months after birth. The majority received care from midwives at their homes, while a few received care at the CC, a health center, or the hospital. Overall, mothers, fathers, and grandmothers expressed positive opinions about postnatal care and stated that it was important to help prevent illness after birth, to check on the health of the mother and baby, and to give mothers advice following birth. The most commonly stated reasons for not seeking or receiving postnatal care included that mothers felt healthy and did not see a reason to receive care, they were too weak to go to the CC or other health service center, or they did not have time. Additionally, one mother expressed that she did not have money for postnatal care.

Health visits for children under 2 years of age. The data from the general survey revealed that nearly all of the mothers interviewed (91 percent [99/109]) had taken their child for a preventive health visit at least once in the last 3 months. In addition, 72 percent (79/109) of mothers had taken their child to a health center when the child was sick. The majority of mothers utilized the CCs both for preventive health visits (95 percent [97/102]) and for seeking care when their children are ill (71 percent [56/79]). The majority of mothers that participated in the semi-structured interviews stated that they took their children to the CC for

their first health visit between 3 days and 1 month after birth and then monthly after that. Many of the mothers also stated that children began receiving vaccinations when they were 1 month old. Some mothers reported utilizing hospitals or health centers when their children were ill. Children primarily received care from the FCs, midwives, and CHWs, with only a few mothers reporting that their children received care from a doctor or nurse when he or she was sick. A few mothers also reported that their children received care from family members and traditional healers when they were sick.

In the semi-structured interviews, mothers explained that they primarily used the CC for preventive and curative care because it is the closest health provider and in most cases is seen as their only option. Many stated that they would prefer to take their children to the closest health center (e.g., in Cahabón or Senahú) because they cannot access doctors or medicine in their respective CCs, as stated by one father: "Sometimes we go to the convergence center, when the doctor is there, but when the doctor is not there we go to town, that's where we go. It would be good if there was also sufficient medicine here, so we did not have to go to town, that is what we hope for and that is what we want." Cost, however, is another critical barrier for accessing these other health services.

Micronutrient supplements

Pregnant women. Mothers explained in interviews and focus groups that they took vitamins during pregnancy and lactation or for specific medical conditions (e.g., anemia), if provided by the CC. Most mothers reported that they received, primarily at the CC or from a midwife, and took iron supplements during pregnancy. The duration and frequency with which they took the iron supplements varied greatly, with mothers reporting taking supplements three times per day to either one or two times per week or once a month for between 1 and 8 months. None of the mothers reported having any problems with the iron supplements. Only one of the four pregnant women reported taking iron supplements twice per week.

Lactating women. The majority of women who participated in the semi-structured interviews reported that they received a vitamin A supplement after birth. There was a lot of diversity in vitamin A supplementation, however, with only two of the six women in the group of women with children under 6 months of age having been given this supplement, compared to about half of the women in the 6–11 month age group and nearly all of the women in the 12–23 month age group. With regards to iron supplements, most women reported taking them during lactation when it was provided at the CC. When unavailable, they did not take them because they could not afford to purchase them. The lack of availability of the minerals and vitamin supplements at the CC was the only reason reported by mothers for not taking them.

Children under 2 years of age. According to mothers of children 6–23 months of age, the majority of children had received vitamin A and iron in the last 6 months, and half had received *Chispitas* (**Table 2.13**). The provision of supplements was more common among children 12–23 months of age than younger children. There did not appear to be any distribution of zinc supplements. However, one mother reported having received a zinc supplement for her child in the last 6 months, and one of the nutrition educators stated that zinc should be given for the treatment of diarrhea. They were, however, not from the same community. The recommendations published by the MSPAS in 2010 [12] state that zinc should be given to children that are stunted or suffering from diarrhea. However, it is unclear if this was in place at the time of the assessments. The majority of the MN supplements were received from the CCs (94 percent for vitamin A, 100 percent for iron, and 98 percent for *Chispitas*). Many of the participants in the semi-structured interviews expressed familiarity with the different types of supplements, but some said that they had not actually given them to their children, primarily because they had not received them from the CC. It will be important in the longitudinal study and operations research to ask caregivers how often they give their children the different MN supplements.

Table 2.13. Number and percentage of mothers whose children received vitamin A or who gave iron and/or Chispitas to their children in the last 6 months

	N	Vitamin A n (%)	Iron n (%)	*Chispitas* n (%)
Mothers with children 6–11 months of age	40	28 (70)	18 (45)	10 (25)
Mothers with children 12–23 months of age	40	40 (100)	39 (98)	30 (75)
Total	80	71 (89)	58 (73)	40 (50)

Iodized salt

Only a minority of the people interviewed knew of and used iodized salt, though all groups interviewed expressed the willingness to use iodized salt if they received information regarding its health benefits.

Opinions regarding health services and personnel

Mothers, fathers, and grandmothers expressed a general contentedness that they now have CCs within their communities. Overall, the grandmothers interviewed were the most enthusiastic about the presence of the CCs, stating that the CCs provided important local (and often the only accessible) health care to their communities, particularly to women of childbearing age and children. Grandmothers further explained that the CCs provided good and immediate care for sick children. Though people seemed generally pleased to have the CCs in or close to their communities, many were frustrated by some of their limitations, including the limited number of days that CCs were open (1 day per month), the amount of time they spend waiting, the lack of chairs or other comfortable places to sit when waiting, the lack of medicines and qualified health personnel, and the limited access that members of the community (other than pregnant women and children) have to receive care at the CCs.

The primary complaint from participants in the semi-structured interviews and focus group discussions was that the CCs lacked medicines and sometimes people were only given prescriptions that they could not afford to fill. Others expressed frustration that medicines were prioritized for pregnant women and not given to others, and some stated that they only received vitamins. A few people specifically stated that some people disliked going to the CC because they got angry that there was no medicine available to help them and they felt abandoned. Another commonly stated concern related to personnel, as mothers, fathers, and grandmothers emphasized that they needed doctors in the CCs and more regular access to health providers at the CCs (i.e., CCs should be open more than 1 day per month) to provide health consults with children and pregnant women as well as for people who are ill.

The primary reasons that were given for not utilizing the CCs were mainly in line with the general complaints and included people not being used to going to the CC, believing that one will not get attention (especially when a lot of pregnant women go) and/or necessary medicines, and embarrassment (in the words of a mother, “la vergüenza hace que los mate” [“the embarrassment is what kills them”]). During the focus group in one of the communities, participants explained the importance of having female health practitioners, as they felt embarrassed to receive care from men (especially during pregnancy). Fathers and grandmothers both expressed frustration about the lack of care for themselves, with fathers stating that they usually had to wait for health care, some saying up to 2 days.

Some mothers had received home visits by doctors, nurses, and midwives, particularly when pregnant. They also noted that medical personnel visited households if someone became gravely ill. A few mothers, fathers, and grandmothers reported that they had received home visits from CHWs for other reasons, usually focused on hygiene.

Some mothers and fathers reported visiting other health facilities to access the services of doctors or medicines that they could not access at the CC, especially when someone was gravely ill. They also reported that the high cost often inhibited their ability to use these other health facilities. Health centers, noted by fathers as being one-half to 1 hour away by car, were the closest alternative medical establishments. Though they generally had more medicines and a doctor available every day, some also experienced shortages of medicines. Mothers that could not afford to go to other health centers explained that they utilized *curanderos*[9] when their child could not be cured at the CC.

2.4. Discussion

In this section, we used qualitative and quantitative information to answer a number of questions related to the supply and demand sides of the health services currently being provided in five communities in Alta Verapaz. The overall objective is to help Mercy Corps design their health-strengthening activities for the PM2A program, PROCOMIDA. Our findings related to each of the seven questions posed are summarized below.

1. Are the SIAS-required supplies available at the CCs?

All of the CCs visited had deficiencies in at least one supply area, but more than half had the basic medicines and supplements that are supposed to be on hand and the majority of the other supplies and equipment that we included in the assessment, such as scales, sterile syringes to administer vaccines, and a cold place to keep the vaccines. These observations were more favorable than expected, based on interviews with staff and community members, in which such an overwhelming concern with lack of medicines and supplements was voiced. This observation, however, only consisted of noting the presence or absence of each of the items and not the quantity or use of those items. Note also that none of the CCs had potable water or transportation available for emergencies.

2. Do health staff have the background, training, and knowledge necessary to provide the SBS?

In health staff's self assessments, very few felt that they had the necessary training and background to do the best possible job, with some stating that they had not received any training to enable them to do their jobs. This was especially true among the community-based health workers (FCs, midwives, and CHWs). Overall, the nurses had a good level of knowledge about most of the major topics, including breastfeeding; complementary feeding; danger signs during pregnancy, lactation, and childhood; prevention of illness; and use of MN supplements. The FIs and nutrition educators were also generally well-informed, though both groups lacked knowledge in some areas. The FCs, midwives, and CHWs had the least knowledge about the different topics, with the CHWs having very little knowledge about anything beyond the importance of hygiene and breastfeeding. The health staff as well as the community members seemed aware of these deficiencies and many requested more training for all health staff, but especially for the community-based health staff. The limited knowledge among the community-based staff members is especially worrisome as they are the people who have the most contact with the community members and often serve as their only access to health- and nutrition-related information.

3. Do health staff provide adequate and accurate nutrition- and health-related information to community members?

The health personnel provided nutrition- and health-related knowledge that was consistent with their knowledge. Nurses, FIs, and nutrition educators, in general, provided community members with the most information, while the provision of information and advice by community-based staff was more limited.

[9] *Curanderos* are traditional healers.

A few exceptions included the provision of basic advice and care to pregnant women by midwives and the provision of information related to hygiene by all staff members. Everyone seemed to have a good understanding of this topic and seemed to be providing the different community members with practical, related knowledge. Information provided about breastfeeding and complementary feeding again was in line with the knowledge of the different health staff members and was reflected in the community members' knowledge (see **Section 4** for more detailed information about community members' knowledge). However, there are some important areas that could be improved in terms of accuracy, including the recognition of danger signs during pregnancy, the definition and duration of EBF, promising practices in complementary feeding and the appropriate use of MN supplements for pregnant and lactating women and for children. Advice and information provided about the recognition, prevention, and treatment of anemia was nearly non-existent. Language and the lack of education materials are likely significant barriers to the transfer of knowledge between some of the paid staff (who generally have the most knowledge) and community members, as well as the community-based health workers.

4. Are the health staff members motivated to do their work and satisfied with their jobs?

Overall, the paid health staff were satisfied with their work and felt that their work was appreciated. Very few stated that they wanted to change their jobs, and many expressed sentiments about how they liked/enjoyed working with the people in the communities to help improve the health of women and children. The volunteer staff, on the other hand, expressed a good deal of frustration about their positions. They stated that they felt obligated to take the positions because they were chosen by the community, but that their jobs took a lot of time and were tiring. They were resentful about the fact that they received no compensation and in some cases not even any training to do their work. Some, however, also stated that they enjoyed their work and felt appreciated.

5. Do community members have basic health and nutrition-related knowledge?

In general, the community members had a good understanding of the importance of good hygiene practices and how this relates to preventing illness. They knew that it is a key component of children's optimal health and development. In addition, they showed good general knowledge regarding the importance of breastfeeding and adequate nutrition, though many reported money and access to foods as the primary limitation in providing mothers and children with the best foods. Almost all understood the importance of pregnant and lactating women and children using MN supplements, but most of them did not know the specific benefits of the supplements or how to use them. In addition, a few of the grandmothers expressed great concern about the use of iron supplements during pregnancy, as they believed they can cause abortion. This belief could pose a significant barrier to the use of MN supplements within this population. Particular attention should be given to addressing this issue in the SBCC strategy.

The people interviewed were generally quite aware of diarrhea and how to prevent it, but had very limited knowledge of anemia and its prevention. When reporting a primary cause of anemia, most stated lack of hygiene. In general, the population knowledge of health and nutrition is consistent with the knowledge of the CHWs. This could either be due to the fact that these people are indeed the primary source of health- and nutrition-related knowledge in these communities or that it is simply a reflection of the most common knowledge in these communities (including among the health staff from these communities).

6. Do pregnant women and children utilize the preventive health services offered at the CCs?

Attendance at preventive health visits appears to be good among pregnant women and children under 2 years of age. The great majority of women attended at least three prenatal visits, and most children had

been taken for a preventive health visit in the last 3 months. While the attendance at prenatal visits was relatively common, the majority of mothers gave birth at home (61 percent in our sample). Ideally, these births would be attended by a midwife from the community, though many people reported that women are only attended by family members. Many caregivers reported that children should be taken to the CC every month. Nearly all of the people interviewed also expressed a general understanding of the importance of vaccines and did not have any problems with receiving the vaccines or having their children vaccinated. Lack of availability of vaccines, rather than fears or taboos related to their use, was reported as the main constraint to immunization.

The community members interviewed expressed overwhelming support for the use of MN supplements for pregnant and lactating women as well as for children. However, few knew or could explain what the different supplements were or how they should be taken. And as was mentioned earlier, there were a few negative beliefs in relation to MN supplements, first that IFA can cause abortion during pregnancy, and second, that MNPs are related to growth failure among infants and young children. In terms of how to use MN supplements, people had the most knowledge about *Chispitas*.

In general, the different community members stated that they utilized the preventive health services as advised by health personnel and that they recognized their importance for the health of women and children. The major reported impediments to the utilization of preventive health services and products (e.g., supplements) were the low availability of services and supplies and the lack of knowledge of the benefits and appropriate use of MN supplements.

7. Are community members satisfied overall with the preventive health services available in their communities?

Overall, community members liked having the CCs in their communities and appreciated the help of the EBS in caring for pregnant women and children. However, a number of people expressed frustrations related to the lack of consistent availability of supplies (primarily medicines and MN supplements), the irregular availability of adequately trained health staff, the limited trainings for community members, the long waiting times, and the limited access of community members other than pregnant women and children to services offered at the CCs.

2.5. Conclusion

Our overall research question was "**how can the provision and utilization of services be improved?**" In addition to answering this question, we considered these results in light of what Mercy Corps had proposed to do within the scope of their health-strengthening activities (i.e., enhance the capacity of health service providers to provide strong maternal and child health and nutrition care and to improve MSPAS extension services through building the capacity of SIAS-implementing NGOs). These results have been discussed with Mercy Corps, and the areas that can potentially be addressed in PROCOMIDA are highlighted in **Box 2.2**. The first category in Box 2.2, "areas for improvement…," lists activities that fall within the scope of what Mercy Corps had identified as areas for health-strengthening activities in its Title II development food aid program application and for which the research revealed a need for improvement. The second category, "other areas for improvement...," lists other topics that could potentially be addressed through PROCOMIDA's health-strengthening activities, but for which either more information is needed about the scope of the problem (e.g., availability of MN supplements and ORS) or about what specifically needs to be done (e.g., utilization of MN supplements and ORS). This category also includes activities that may fall outside of the scope of what Mercy Corps can do within PROCOMIDA (e.g., availability of medicines and vaccines). More detailed suggestions of how activities could be tailored to address some of the specific needs that were highlighted in the formative research are listed in **Box 2.3**. Discussions with the health staff and community members revealed four primary areas

for improvements in the implementation of local health services: **training, incentives, supplies,** and **frequency of services and coverage**.

- **Training:** To improve their capacity, the health staff requested more and longer trainings for both health staff and community members. One of the CHWs, however, stated that she does not have time to attend trainings, as she has to attend to her own household, which may present a problem among volunteer staff. In addition to increasing the number, variety, and duration of trainings, some of the CHWs requested that the trainings be conducted in Q'eqchi. They indicated that they would like the trainers to use more audiovisual materials, to have more patience, and to take more time to make sure that everyone understands the lessons. In addition, they requested materials that they could take home and use to help them remember the lessons and to help them when they are teaching the community members. These activities fall within the scope of what Mercy Corps proposed to do in its Title II development food aid program application as part of its health-strengthening activities.
- **Incentives:** Many of the health staff recognized that the community-based health staff did not receive incentives and often did not even receive the necessary training to do their work. They requested that these staff members be provided with training, salaries, or other incentives to help them stay motivated. We found a high turnover of staff among the midwives and CHWs, which makes it difficult to maintain trained staff members at this level. This problem is not unique to Alta Verapaz and is an area that requires attention, since this component is one of the commonly stated advantages of SIAS [3]. Simply having CHWs and midwives enrolled as volunteers is unlikely to improve the health and nutrition situation of the people in these communities; the volunteers need to receive the necessary training, incentives, and support to do their jobs and to remain in their jobs over time. Addressing this issue, however, may be beyond the scope of what Mercy Corps can address through PROCOMIDA.
- **Supplies:** Mercy Corps may be able to work with the MSPAS and the implementing NGOs to improve the consistency with which supplies are available at the CCs. The specifics of how to do this, however, are still unclear at this time.
- **Frequency of services and coverage:** Increasing the frequency of services and expanding coverage is beyond the scope of Mercy Corps health-strengthening activities and thus will not be addressed here.

Box 2.2. Areas for improvement in service delivery and utilization that could potentially be addressed through PROCOMIDA's health-strengthening activities

Areas for improvement that fall within the scope of the activities mentioned in Mercy Corps Title II development food aid program application

1. Training provided by NGOs to health staff, especially to FCs, midwives, and CHWs: The CHWs and midwives have the least amount of training and the most exposure to the community members, though most of the health staff could use additional trainings in at least a few of the areas investigated in this research.
2. Training provided to community members
3. Audio visual materials for trainings of health staff and community members

Other areas for improvement that could potentially be addressed through PROCOMIDA's health-strengthening activities but for which more information is needed

4. Regular availability of medicines, MN supplements, and vaccines
5. Availability and utilization of MN supplements
6. Availability and utilization of ORS

Box 2.3. Recommendations for PROCOMIDA's health-strengthening activities

1. Provide incentives such as additional training to community-based health workers, including FCs, midwives, and CHWs.
2. Examine the possibility of redesigning how people are chosen for community positions. People who volunteer for the positions may be more likely to be motivated to participate in the necessary trainings and continue with the job more than those who are nominated by their communities.
3. Investigate the recent hygiene-related campaigns, as these messages appear to be the most widespread and understood, which could provide good information about how to design a successful SBCC campaign, including delivery channels, frequency of exposure to messages, and types of messages.
4. Support implementing NGOs to provide more training to health staff, especially to midwives and CHWs, with special attention given to improving the quality of trainings (i.e., conducting in Q'eqchi when appropriate, utilizing more participatory teaching methods).
5. Support implementing NGOs to provide more trainings to community members on topics that seem to be the least well-understood, such as promising practices in IYCF; diet during pregnancy and lactation; danger signs during pregnancy, birth and postpartum; and the use of MN supplements.
6. Directly provide training on some of the aforementioned topics to health staff and community members.
7. Provide health personnel with laminated cards for reference and to use when talking to community members. Some of the specific cards that should be designed include:
    a. Diet recommendations during pregnancy and lactation, including pictures of examples of foods from different food groups and that show an increased need for food and water
    b. Recommendations for promising IYCF practices by age group and for feeding during illness and recovery, including pictures of different foods that should be given and amount and consistency of food
    c. Recommendations for use of MN supplements during pregnancy and lactation with pictures of different supplements, a picture of what they are for (the primary benefit of taking the supplement), and some sort of calendar or way to explain how frequently to take them and how they should be used
    d. Recommendations for use of MN supplements for children with pictures of different supplements, a picture of what they are for (the primary benefit of taking the supplement), and some sort of calendar or way to explain how frequently to take them and how they should be used
8. Provide community members with copies of the aforementioned pictures (especially in regards to the use of MN supplements, as there appears to be limited knowledge of how or why to use these, especially during pregnancy).
9. Work with the MSPAS to leverage a more consistent supply of medicines and other equipment and supplies to the CCs.

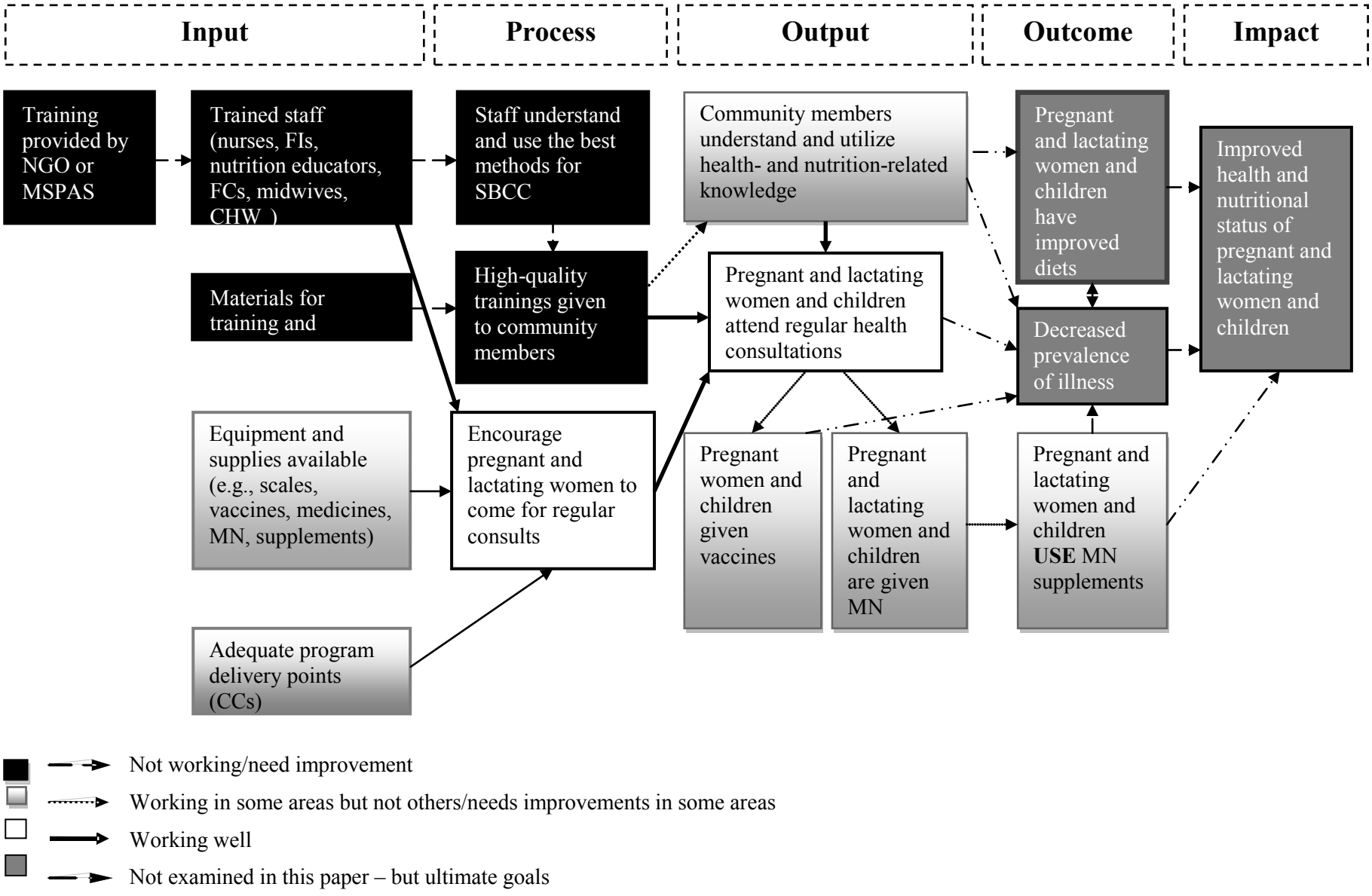
In conclusion, SIAS has clearly extended basic health services to a large proportion of the rural population in Guatemala, who previously had been limited to no access to even basic health services [3]. However, though coverage has increased, the quality and consistency of service provision is variable [3]. In the five study communities in Alta Verapaz, it appears that some parts of the system are working well, whereas others could use major improvement.

Figure 2.1 illustrates a proposed program theory framework through which SIAS activities could contribute to reductions in the prevalence of illness and improvements in other health and nutrition outcomes for women and children (represented by the dark gray boxes). The black boxes represent areas that the research revealed could use some major improvements and primarily highlight issues related to trainings at various levels. The white boxes represent areas that seem to be working well (i.e.,

encouragement to attend and regular attendance at preventive health visits) or do not seem to significantly contribute to whether or not community members utilize services (i.e., adequate program delivery points). Finally, the partially shaded boxes are areas that appear to be working in some ways but that could also use improvement (i.e., knowledge and utilization of health- and nutrition-related education with specific reference to MN supplements).

While Mercy Corps does not have the mandate nor capacity to make major changes in the structure or supply system of the SBS in Alta Verapaz, it does have the opportunity through PROCOMIDA's health-strengthening activities to help support and improve the system in the areas in which they are working. The primary recommendations that came out of this research and through various discussions with PROCOMIDA staff members are listed in Boxes 2.2 and 2.3. If successful, these activities may serve as models to contribute to improvements in health service delivery and utilization in other areas throughout Guatemala.

Figure 2.1. Suggested areas for Mercy Corps to focus on in its health-strengthening activities and how it may contribute to improvements in maternal and child health and nutrition



3. Objective 2: Test the acceptability of the LNS products to be used in some program areas of PROCOMIDA

3.1. Introduction

One part of the impact evaluation that will be done for PROCOMIDA will compare the differential impact of LNS and a MNP supplement as substitutes for the individual CSB ration. The main rationale for testing LNS in this study is that it could provide the additional MNs needed by infants and young children, which the donated food commodities currently provided as individual rations (CSB) cannot provide for this age group [5,13,14]. Further, CSB is thought to be widely shared, thus limiting the MN intake of any given individual from the CSB.

LNS also contains energy, protein, and essential fatty acids, which are essential for the utilization of MNs and for optimal growth. LNS is easy to use and preserve and in limited acceptability testing in Africa has been shown to be well accepted by mothers and children. There is some preliminary evidence to support that LNS improves growth among children 6–18 months of age [14,15] and that these benefits persist up to 2 years after the end of supplementation [16].

The formulations (one for pregnant and lactating women and one for children) that will be used in Guatemala are based on custom formulations that have been recently developed by Nutriset (Malaunay, France). These products have not yet been used in Guatemala and are unfamiliar to the population. Therefore, we conducted acceptability tests among pregnant women and women with children under 6 months of age and with children 6–23 months of age to assess the acceptability of the products as well as to assess any adverse outcomes 1 and 24 hours after consumption of the LNS. This section describes the results from those tests.

3.2. Research design and methods

Study area

The research was conducted in the five municipalities in Alta Verapaz that were originally selected to participate in PROCOMIDA: Cahabón, Carchá, Cobán, Panzós, and Senahú. These five communities represent both peri-urban and rural areas.

Study participants

The study participants consisted of a convenience sample of pregnant women and lactating women with children 0–5 months of age and children 6–23 months of age and their mothers. The primary language spoken by the mothers was Q'eqchi. In total, 50 children 6–23 months of age participated (11 in Cobán, 9 in Senahú, and 10 in the other three municipalities) and 49 pregnant women or women with children under 6 months of age participated (8 in Cahabón, 11 in Senahú, and 10 in the other three municipalities).

Methods

The acceptability tests were conducted separately for 1) children 6–23 months of age and 2) for pregnant women and women with children under 6 months of age. In both cases, the acceptability tests included a test feeding and rating of the organoleptic properties of the products, a focus group discussion following the test feedings, and an assessment of allergic symptoms.

The protocol was basically the same in both cases and began with the test feeding. The LNS (10 g) was mixed with a few mashed spoonfuls of banana and then given to the participant to eat. The participants were instructed to try and consume the whole amount given or as much as possible. The total preparation

was weighed before and after the feeding to assess how much each participant consumed. Directly following the test feeding, the participant or mother of the participant was asked to rate the organoleptic qualities of the product on a scale of 1 to 5, with 5 being the highest score. They were also asked to share any additional comments they might have about the products. After all of the women completed the individual ratings, a focus group discussion was conducted with the participants or the mothers of the participants to further discuss what they thought about the products, whether or not they would use these types of products, and if they would buy the products if they were available. The last part of the acceptability trials consisted of assessing any allergic reactions immediately following the focus group discussions (about 1 hour after the test feeding was completed) and again the next day (about 24 hours after the test feeding).

Data analysis

The mean and standard deviation (SD) for each of the organoleptic qualities and the overall rating were calculated and are presented for each category and for each group.

Transcripts from the focus group discussions were read and summarized along with the individual comments provided by the participants during the post-tasting feedback.

3.3. Results

Overall, the LNS was very well accepted by pregnant women and women with children under 6 months of age and by children 6–23 months of age. Women in both groups rated the supplements very highly on a number of organoleptic characteristics, including appearance, taste, smell, color, and taste (**Table 3.1**). The overall rating of the product acceptability was 4.9 out of 5 points possible in both groups. In addition, women in both groups expressed a general approval of the products and willingness to use the products both for themselves and for their young children.

Table 3.1. Ratings of LNS, by group

	n	Appearance	Smell	Color	Taste	Consistency	Overall
Pregnant women and women with children under 6 months of age	49	4.8 (0.4)[a]	4.9 (0.3)	4.8 (0.4)	4.9 (0.4)	4.9 (0.4)	4.9 (0.4)
Children 6–23 months of age	50	4.7 (0.5)	4.7 (0.4)	4.7 (0.5)	4.8 (0.4)	4.8 (0.4)	4.9 (0.3)

[a] Mean (SD)

Pregnant women and women with children under 6 months of age

All of the pregnant women and women with children under 6 months of age ate the full serving of banana mixed with LNS. On average, the weight of the unconsumed portion of the food was 1.3 (1.2) g (range = 0–5 g) out of the average 50 g of food given (about 40 g banana and about 10 g LNS). The women in this group rated the LNS very highly on all of the organoleptic qualities and gave the product a rating of 4.9 out of a possible score of 5 for overall acceptability. These ratings were not significantly different between mothers that were pregnant and those who had children under 6 months of age. Women in Cahabón were more likely to rate the products lower than those in other communities overall and on taste and consistency; however, all of these mothers consistently rated the LNS a 4 or 5 on each property tested as well as overall. There were no reported adverse outcomes within the first hour or 24 hours after the taste test.

Overall, the mothers expressed enthusiasm about the products, stating that they liked the taste of the product and that it tasted like peanuts. Some expressed that they preferred LNS to the pills they received from the CCs. Many also said that they would be willing to buy this product if they had money available,

and some asked where they could obtain the LNS. In addition, a number of the mothers expressed general knowledge about how MN products could support and improve their health during pregnancy and lactation as well as the health and nutrition of their children during this time. The only concerns expressed by this group of mothers was the availability of foods to mix with the LNS, having money to buy the product, the possibility that it might be viewed by their husband as a medicine that may harm the mother, the possibility that the husband would not let them use the supplement, and the possibility that they may not be able to consume the supplement if they were sick.

The women in this group said that they would like to learn more about how to prepare the product (i.e., what foods to mix it with), how often they should use it, for how long they should use it during pregnancy and lactation, and how it compares with other MN supplements. They would like to learn about the product and how to use it through trainings, home visits, and demonstrations.

Children 6–23 months of age

Mothers of children 6–23 months of age also rated the LNS very highly in all categories and gave it an average score of 4.9 out of a possible 5 points. The sex or age of the child and the age of the mother were unrelated to the overall score. Ratings were also similar between communities. On average, children were given 39 g of food (30 g of banana and 9 g of LNS) and consumed 72 percent of this food. Seven children refused to eat more than one or two bites of the food. The mothers of four of these children commented that their children were sick and therefore did not want to eat the food, but they thought their children would eat it if they were not sick. The other three did not explain why their children did not eat the food but their impressions of the LNS were all favorable. There were no reported adverse outcomes within the first hour or 24 hours after the taste test.

The mothers in this group were also very enthusiastic about the LNS, stating that they thought their children really liked it, which they could tell because they ate so much of the food. Many of the mothers stated that they would like to know how to make it or where they could buy it. One mother stated that she thought her child would eat it every time that it was offered to her. Mothers again expressed general knowledge related to the benefits of a product such as LNS, stating that it would help their children to be strong and grow and that it can help prevent their children from becoming sick. The main concern expressed by the mothers of children 6–23 months of age was the availability of the LNS or money to purchase the product. In addition, in one focus group, mothers stated that they did not have anything to mix the food in and that there may be problems with sharing among their children as they often want the same foods.

Mothers in this group said that they would like more information about what vitamins the LNS contains, what foods they can mix the LNS with, and how often they should give the LNS to their children. Like the women in the other group, these mothers said that they would prefer to receive information about this product and how to use it through trainings, home visits, and demonstrations.

3.4. Discussion

Overall, the LNS products were very well accepted in the communities by both groups of participants, i.e., pregnant women and women with children under 6 months of age and children 6–23 months of age. Therefore, it seems unlikely that the program will face major difficulties at the household level with the acceptance of the LNS products. Throughout the formative research, caregivers in general, and mothers specifically, expressed an overwhelming support for the use of vitamins and MN supplements both for pregnant and lactating women as well as for young children, stating the importance of these supplements for the health and strength of women and children. This understanding and support, coupled with the excitement around this new product, bode well for the general acceptance of LNS in the communities of Alta Verapaz, where it will be distributed.

The main concerns expressed by the mothers included the availability of LNS, the money to purchase it if it is not provided for free, the possibility that it will need to be shared with other members of the households, especially other children, and the fact that in some cases their husbands may not allow them to use the LNS. The first concern will not be an issue in PROCOMIDA, since it will be provided for free. However, we should pay careful attention to this issue and collect information about the feasibility of households purchasing this product and/or the MSPAS adopting this product for future use (if it proves to be an effective intervention). The second concern may be unavoidable, but every effort should be made to include messages about the importance of the LNS for the targeted beneficiary (either a pregnant woman, a woman with a child under 6 months of age, or a child 6–23 months of age). The messages should emphasize the increased nutrient needs of young children and of women during pregnancy and lactation. The third concern can also be addressed in the SBCC to some extent by including fathers in the SBCC sessions.

3.5. Conclusion

In conclusion, LNS was widely accepted by both groups of women, and thus we do not expect any problems with the acceptability of this product. However, it will be important to monitor compliance over time and any issues related to the use of the LNS, including sharing among household members, any potential adverse effects, and other barriers that may prevent optimal uptake of the product. In addition, data should be—and will be—collected through the impact evaluation, operations research, and cost study to examine issues related to the feasibility of wider adoption of LNS.

4. Objective 3: Test the acceptability of the MNP to be used in some program areas of PROCOMIDA

4.1. Introduction

A second product that will be used in the PROCOMIDA program to replace the individual ration of CSB is MNPs. The MNPs, which are specifically formulated for pregnant and lactating women and children 6–23 months of age, offer an attractive option for improving the MN intake and status of mothers and children within the context of FA-MCHN programs, especially in countries where energy intake is unlikely to be severely limited. Evidence from Haiti demonstrated that the MNPs provided through an FA-MCHN program were generally used for the target child, with limited sharing [17]. Thus, MNPs have the potential to increase MN intake and status both through the specially designed formulations as well as by the fact that they may not be shared with other family members as CSB usually is.

Among young children, the anemia formulation of Sprinkles© (an MNP with five micronutrients: iron, zinc, vitamin A, vitamin C, and folic acid) has been shown to be highly effective at reducing the prevalence of anemia in short periods of time [18,19]. In Haiti, for example, approximately half of the children receiving fortified cereal blends were anemic, and Sprinkles© supplementation reduced anemia prevalence to 24 percent in 2 months [18]. There is no evidence to date, however, to support the use of the five MN formula MNPs to improve growth. This could be due to many reasons, including wrong MN mix (the anemia formulation was originally designed to address anemia, not growth), too short a duration of supplementation, inadequate amount of zinc provided in the supplement, and a low prevalence of stunting in the populations where the MNPs were tested. The new formulation of MNPs that will be used in *PROCOMIDA* aims to not only improve iron status and prevent anemia among children, but also to improve their growth through the provision of multiple MNs, including a higher concentration of zinc. Furthermore, the MN content of these MNPs will be identical to that used in the LNS so that we can compare the effectiveness of these two supplements in improving growth and preventing anemia, as well as for other health and nutrition outcomes.

MNPs will also be distributed to pregnant women and women with children 0–5 months of age in selected program areas. Though the use of MNPs as a delivery mechanism for the provision of MNs during pregnancy has not been widely studied, the advantages of providing multiple MNs compared to a placebo or to IFA alone have been documented [20,21].

To make the nutrient formulation of MNPs identical to the nutrient composition of the LNS products (with the exception of fat and energy),[10] the formulation had to include macrominerals such as potassium, calcium, magnesium, and phosphorus, which are not typically included in MNPs. The formulation also had to include higher concentrations of certain MNs (e.g., iron, zinc) than are commonly used in MNPs. Both of these factors have contributed to challenges in developing an organoleptically acceptable formulation. One solution to this was to divide the daily dose into two servings, thus reducing the nutrient density per serving and hopefully diminishing any adverse organoleptic properties. To determine if either the single or split dose of these newly developed MNP products was acceptable to pregnant women and women with children 0–5 months of age and for children 6–23 months of age, we conducted acceptability trials in Alta Verapaz with these two groups using the two different doses of each MNP.

[10] The LNS that will be distributed by PROCOMIDA differs from the MNPs in that it also contains energy (118 kcal for both women and children), protein (2.6 g for both women and children), fat (10.0 g for women and 9.6 g for children) and fatty acids (linoleic acid [4.59 g for women and 4.46 g for children] and α-linoleic acid [0.59 g for women and 0.56 g for children]).

4.2. Research design and methods

Study area

The research was conducted in five communities in the four municipalities in Alta Verapaz that will be included in PROCOMIDA: Cahabón, Carchá, Cobán, and Lanquin. These five communities represent both peri-urban and rural areas.

Study participants

The study participants consisted of a convenience sample of pregnant women and lactating women with children 0–5 months of age and children 6–23 months of age. The primary language spoken by the mothers was Q'eqchi. In total, 48 children 6–23 months of age and 48 pregnant women or women with children 0–5 months of age participated in the trials. The same participants took part in the acceptability tests for both doses of MNP.

Methods

The acceptability tests were conducted separately for children 6–23 months of age and for pregnant women and women with children 0–5 months of age. In both cases, the acceptability tests included a test feeding and rating of the organoleptic properties of the products, a focus group discussion following the test feedings, and an assessment of allergy symptoms. The MNP was mixed with a few mashed spoonfuls of banana and then given to the participant to eat. The participants were instructed to try to consume the whole amount given or as much as possible. The total preparation was weighed before and after the feeding to assess how much each participant consumed. Directly following the test feeding, the participant or mother of the participant was asked to rate the organoleptic qualities of the product on a scale of 1 to 5, with 5 being the highest possible score. In addition, they were asked to share any additional comments they might have about the products. After all of the women completed the individual ratings, a focus group discussion was conducted with the participants or the mothers of the participants to further discuss what they thought about the products, whether or not they would use these types of products, and if they would buy the products if they were available. The last part of the acceptability trials consisted of assessing any allergic reactions. This was done immediately following the focus groups discussion (about 1 hour after the test feeding was completed) and again the next day (about 24 hours after the test feeding).

The tests for the two different doses were done on 2 consecutive days, and the order in which the different doses were tested alternated by community. Following the second day of testing, participants were asked a series of questions about their preferences for the two different doses on a variety of factors, such as taste, smell, ease of use, and which they would purchase if they had a choice. In addition, pregnant women and women with children 0–5 months of age were asked a few questions about their preferences for the MNPs compared to the IFA pills currently distributed by MSPAS.

Data analysis

The mean and SD for each of the organoleptic qualities and the overall rating were calculated and are presented for each category and for each group. Differences in the occurrence of adverse effects were also examined between the two doses for both groups of participants using chi-square tests.

Transcripts from the focus group discussions were read and summarized along with the individual comments provided by the participants during the post-tasting feedback.

4.3. Results

Pregnant and lactating women

Overall, the acceptability ratings for the MNPs were good, with an average rating of about 4 (good) across the categories that were assessed (**Table 4.1**). In comparing the single versus split dose, pregnant and lactating women demonstrated a clear preference for the split dose formulation. There was a significantly stronger preference for the split dose in terms of smell, taste, consistency, and overall acceptability. In addition, the pregnant and lactating women who participated in the acceptability trials also consumed a larger proportion of the banana mixed with the split dose formulation as compared to the banana mixed with the single dose formulation (median = 60 percent for the single dose versus 93 percent for the split dose). In the focus group discussions, they also had many more positive comments regarding the split dose compared to the single dose supplement.

Table 4.1. Ratings of MNP, by split or single dose for pregnant women and women with children under 6 months of age[a]

	Single dose	Split dose
n	48	48
Appearance	4.2 ± 0.6	4.4 ± 0.5
Smell	4.3 ± 0.8[b]	4.7 ± 0.6
Taste	3.8 ± 1.0[b]	4.6 ± 0.6
Consistency	4.2 ± 0.6[b]	4.6 ± 0.6
Overall	3.8 ± 1.1[b]	4.8 ± 0.5

[a] Values are means ± SD. [b] $p < 0.05$

Although a few women reported side effects, such as nausea, headache, and vomiting, these were not different between the two doses (**Table 4.2**). A few women reported that they may not be able to take the MNP supplements because they made them feel nauseous. In eight of the 10 focus group discussions, the women said that they would use the supplements (the two focus groups that did not say this were for the single dose MNP). They also generally stated that they would take the supplements as they were instructed, though a few made comments such as they only have time to take it once a day, they would not take them because of side effects (both supplements), or they were too strong to take twice per day (single dose MNP). In all of the focus groups, the women discussed the need for information about what the supplements contain, how to use the supplements, and what foods to mix them with in order to use them.

Table 4.2. Number of pregnant women or women with children under 6 months of age who reported adverse effects of the MNP products, by split or single dose

	Within 1 hour		Within 24 hours	
	Single dose	Split dose	Single dose	Split dose
n	48	48	48	48
Rash	0	0	1	0
Nausea	7	1	2	0
Difficulty breathing	2	5	3	1
Feeling of fullness	1	1	1	0
Vomiting	3	0	1	0
Headache	2	1	4	2
Other	3	0	0	2

Following the 2 days of testing, with the single dose on one day and the split dose on the other, women were asked which supplement they preferred in terms of ease of use, appearance, taste, smell, consistency, and overall acceptability. The results from these brief interviews were consistent with the results from the 2 days of testing and demonstrated a clear preference for the split dose formulation. The vast majority of the 47 women who participated in the final interviews stated a preference for the split dose formulation on all factors including taste, smell, consistency, ease of use, and overall preference (range = 39–44 for the split dose versus 3–8 for the single dose). On this final day, women were also asked whether they would prefer to take the MNPs or MN in a pill form. Though the majority of the women had positive things to say about the split dose formulation, many of the women said that they would prefer to take a pill (66 percent) as compared to an MNP supplement (34 percent) (**Table 4.3**).

Table 4.3. Comparison of preferences of pregnant women and women with children under 6 months of age (n = 47) for using a MN pill compared to an MNP[a]

	MNPs	MN Pill
Overall	16	31
Ease of use	3	23
No taste	5	4
Does not like to mix with food	–	2
Likes to mix with food	2	–
Stronger or has more vitamins	5	–

[a] Not everyone provided specific comments as to why they preferred one form of the MN supplement over the other.

Children

Overall, the acceptability ratings for the MNPs for children were very good, with an average rating of about 5 (very good) across the categories that were assessed (**Table 4.4**). In comparing the single versus the split dose, mothers of children 6–23 months of age also expressed a preference for the split dose formulation. This preference was seen both in the ratings of the two different doses following the taste tests and when they were asked to compare the two doses on the various criteria. However, during the focus group discussions, the comments related to the two different doses (single versus split dose) were similar, with most mothers saying that they liked the supplements and that they felt the supplements either tasted and smelled good or had no taste or smell. There were very few negative comments, but the majority of these were for the single dose supplement, with mothers reporting that the children did not eat the food because they did not like the supplement and some saying that they did not like the supplement or thought it was too strong. The children 6–23 months of age who participated in the acceptability trial consumed about the same proportion of the banana mixed with the split dose as compared to the banana mixed with the single dose (median = 88 percent for the single dose versus 90 percent for the split dose).

Table 4.4. Ratings of MNP, by split or single dose for children 6–23 months of age[a]

	Single dose	Split dose
n	48	48
Appearance	4.4 ± 0.6	4.5 ± 0.5
Smell	4.6 ± 0.5[b]	4.9 ± 0.3
Taste	4.4 ± 0.8[b]	4.6 ± 0.7
Consistency	4.5 ± 0.7	4.5 ± 0.6
Overall	4.3 ± 0.9[b]	4.8 ± 0.5

[a] Values are means ± SD. [b] $p < 0.05$

Mothers of children 6–23 months of age also reported some adverse effects that they associated with giving the MNP to their children (**Table 4.5**). Among the most commonly reported adverse effects were nausea, vomiting, and wheezing. When asked about any reactions in the last 24 hours, the primary symptoms reported were nausea and vomiting. In addition, a couple of the mothers also mentioned that their children had diarrhea after taking the MNP, and two said that their children were crying more than usual.

Table 4.5. Number of mothers of children 6–23 months of age who reported adverse effects of the MNP products, by split or single dose

	Within 1 hour		Within 24 hours	
	Single dose	Split dose	Single dose	Split dose
n	48	48	48	48
Rash	0	0	1	2
Nausea	5	3	2	5
Difficulty breathing	5	2	3	0
Feeling of fullness	2	2	3	0
Vomiting	3	3	3	4
Other	0	1	3	2

One of the primary concerns cited in the focus group discussions in terms of giving the MNPs to their children was the need for information about what effects to expect, both positive and negative. Furthermore, they would like more information about what the MNPs contain, how to use them, and what foods to mix them with. The majority of the women in the focus group discussions said that they would be willing to give their children the MNPs twice per day, but a few stated that they would not be able to, either because they were strong vitamins, they did not have time, or because they did not know how to use it. Other mothers reported that they would give the MNPs three times a day, because this is the number of times they feed their children and because it will help them grow bigger and stronger faster. Mothers would like to receive more information about the MNPs through trainings and demonstrations.

4.4. Discussion

Overall, the split dose MNPs were the most acceptable supplements for the pregnant women and women with children 0–5 months of age and for children 6–23 months of age. Among the women's group, there was a very strong preference for the split dose, with many women stating that they really did not like the single dose supplement and some saying that they would not use it. The women were, however, supportive of the split dose, saying they liked the taste or lack thereof and liked that these were vitamins that would make them and their babies healthy and strong. When asked if they would prefer to use the MNP in comparison to an MN pill, the majority stated that they would prefer an MN pill (66 percent versus 34 percent), mainly due to the ease of use. However, past research has shown that compliance with prenatal IFA (given as a pill) is often low [4].

For the children's group, although there was also a relatively strong preference for the split dose based on the ratings and the preference questions, the children ate about the same proportion of the food regardless of the dose, and the reported adverse effects were similar between the two groups. Though the mothers were generally supportive of giving their children these MNPs, some concern was raised in informal discussions about the association between the currently distributed MNP supplements (*Macrovital*) and children's growth. Specifically, a few participants stated that since they have been giving *Macrovital* to their children, they have noticed them not growing well. It is unlikely that the supplement is causing this perceived lack of growth. However, the women's perceptions may be correct in terms of the timing of when the children start receiving the supplements (generally between 6 and 12 months) and general patterns of children's growth in

that it coincides with when vulnerable children often face marked growth deficits as compared to global standards [22]. This negative association could be a major impediment in the acceptability of these supplements and needs to be addressed through the SBCC strategy.

In general, both groups requested more information about the supplements. They were primarily interested in knowing what the supplements contain, why they should use them, how they are different from other MN supplements, how to use them, and with what foods they could mix them. Neither group thought there would be problems with sharing, noting that family members understand that pregnant and lactating women and young children need these kinds of vitamins. Among the women in the women's group, all but one said their husbands would be supportive of their use of these MNPs. This information should be included in the SBCC strategy and fathers should also be targeted for key messages in order to ensure their ongoing support for their wives and children to use these supplements.

The women who participated in the focus group discussions for both groups of MNP stated that they would be willing to take (or give to the child) the supplements as instructed, whether it was once, twice, or three times per day. Some, however, mentioned that they would only be able to take it (or give it to the child) once per day due to a lack of time or because of side effects. Others also mentioned that they would take it (or give it to the child) three times a day with the belief that more was better and because they usually have three meals. It will be important to address the importance of the correct use of the MNPs in the SBCC strategy.

Though the numbers of adverse effects were not different between the two different doses for either group, there were more side effects reported than expected. It is unclear if these adverse effects were indeed due to taking the MNPs or to other existing illnesses or normal symptoms associated with pregnancy. Also, in the case of shortness of breath, Mercy Corps staff members believe that this was not translated accurately into Q'eqchi. The meaning of the word used in Q'eqchi more accurately translates to a feeling of fullness rather than difficulty breathing or shortness of breath. It will be important to monitor these potential adverse effects over the life of the program, as well as any potentially confounding factors that could affect compliance, especially existing illness.

To ensure maximum acceptability and compliance for the use of the MNPs, the following topics need to be addressed in the SBCC strategy:

1. General information about children's health and nutrition and associations with MNs
    a. General information about children's growth patterns
    b. Relationships between growth and MNs
    c. Relationships between illness and MNs
    d. Relationships between anemia and MNs
2. General information about the MNPs
    a. Composition
    b. How they are different and/or the same as other MN supplements
    c. Benefits of the supplements
    d. Potential adverse effects
3. Instructions for use of the MNPs
    a. Who should use them
    b. How often they should use them
    c. The types and examples of foods with which they can mix them, as well as those to avoid

Mothers specifically requested to receive this information through trainings and demonstrations. In addition, visual materials to leave with the mothers for how to use the MNPs should also be designed to help remind them of the instructions for use.

4.5. Conclusion

In conclusion, the split dose was well accepted by both groups. However, it will be important to monitor any adverse effects associated with the use of the MNP products for both mothers and children. General acceptability of the MNPs should also be assessed in an ongoing manner and any potential problems with their use addressed as necessary. Compliance over time will also need to be monitored.

5. Objective 4: Assess current maternal and infant and young child care, nutrition, and health-related practices to help inform the development of PROCOMIDA's SBCC strategy

5.1. Introduction

The PROCOMIDA program aims to improve maternal and child nutrition through the provision of food assistance and a well-designed SBCC strategy. To help Mercy Corps develop their SBCC strategy related to maternal and child diet and nutrition, we designed a formative research study that examined three main topics: maternal diet during pregnancy and lactation, breastfeeding practices, and complementary feeding practices. In the formative research we specifically addressed current practices in each of these main categories, the perceptions and beliefs regarding these practices, the barriers that may prevent people from adhering to recommended promising practices, and factors that may be helpful in promoting uptake of promising practices. For maternal diet and lactation, we specifically examined current practices related to foods perceived as being appropriate or to be avoided during this time. In terms of breastfeeding, the key practices that were addressed included timing of initiation of breastfeeding, feeding of colostrum, duration of EBF, duration of continued breastfeeding, use of expressed breast milk, on-demand feeding, and use of bottles. Research on complementary feeding practices included practices related to the timing of introduction of complementary foods, types of complementary foods, quantity of food, frequency of feeding, the use of ASF, and feeding during illness. In addition, a few questions regarding feeding style were also included in the interviews and surveys.

In this section, we present the research design and methods and the results of the formative research according to the following three objectives.

1. Describe the current practices, behaviors, and beliefs related to maternal diet during pregnancy and lactation and IYCF in a selection of communities in Alta Verapaz.
2. Identify the practices, behaviors, and beliefs that should be addressed in the SBCC strategy.
3. Provide suggestions regarding topics that should be included in the SBCC strategy to also promote the utilization of preventive health services and the use of LNS and MNP.

5.2. Research design and methods

The formative research was implemented in three phases. Phase 1 took place in November and December of 2009, Phase 2 in February and March of 2010, and Phase 3 in September and October 2010. Phase 1 was used to collect information to help inform the SBCC strategy and the health-strengthening activities and consisted of general surveys, semi-structured interviews, focus group discussions, health facility assessments, and key informant interviews with health staff. Phase 2 of the research included recipe trials to further help inform the SBCC strategy, and acceptability tests for the LNS that will be used in some of the program areas. Phase 3 included recipe trials for foods to prepare with CSB and acceptability tests for the MNPs.

The primary results presented in this chapter came from four data collection methods: general surveys, semi-structured interviews, focus group discussions, and recipe trials. The general survey and semi-structured interviews were adapted from *Pro*PAN. For the three groups of women (pregnant and lactating, mothers of children 6–11 months of age, and mothers of children 12–23 months of age) we adapted both instruments, and for fathers and grandmothers we only adapted the semi-structured interview. The general survey included only the mothers. The focus group discussion guides were developed by IFPRI and were adapted for three groups: 1) a combined group of mothers, 2) fathers, and 3) grandmothers. The recipe trials were also adapted from *Pro*PAN and were conducted separately with mothers of children 6–11

months of age and with mothers of children 12–23 months of age. Descriptions of each of the methods are provided below, and the number of assessments of each type that were carried out with different groups is provided in **Table 5.1**.

Table 5.1. Total number of assessments conducted for each type, by group and within each community[a]

	Pregnant and lactating women[b]	Mothers of children		Fathers	Grandmothers
		6–11 months	12–23 months		
General surveys	40 (8)	40 (8)	40 (8)		
Semi-structured interviews	10 (2)	10 (2)	10 (2)	10 (2)	10 (2)
Focus group discussions		5 (1)		5 (1)	5 (1)
Recipe trials		5 (1)	5 (1)		

[a] The numbers in each cell represent the total sample size, and the number in parenthesis represents the sample size per community.
[b] Groups: pregnant women and women with children under 6 months of age (pregnant and lactating women), women with children 6–11 months of age, women with children 12–23 months of age, fathers with children under 2 years of age, and grandmothers.

The instruments that were used to help inform the SBCC strategy were primarily adapted from *Pro*PAN [11] and included modified versions of the general survey, semi-structured interview, and recipe creation exercise. *Pro*PAN was developed to guide governments, NGOs, and international organizations in the identification of nutritional and dietary problems among infants and young children; to determine the causes of these problems, including beliefs associated with different practices; and to plan an intervention to address these problems. The original instruments were specifically designed to gather information about IYCF practices; therefore, the IFPRI team modified the existing instruments to cover other topics that will be included in the SBCC strategy, such as maternal nutrition and care-seeking behaviors. In addition, a focus group discussion guide was developed by IFPRI to further address these issues using a different method. A mixed methods approach was used to address all of the objectives to accomplish the triangulation of data—getting a variety of angles on and in-depth information regarding topics central to the SBCC strategy.

Study area

One community from each of the municipalities that were selected to participate in PROCOMIDA was selected to participate in the formative research. The formative research was conducted before program implementation began. Over the course of the formative research, the municipalities that were selected to participate in PROCOMIDA changed, thus the municipalities represented in the formative research changed from the first two rounds of the formative research to the third round to reflect these changes. The originally selected municipalities were Cahabón, Carchá, Cobán, Panzós, and Senahú, and thus the first two rounds of the formative research were conducted in one community from each of these five municipalities. During PROCOMIDA's planning a decision was made to exclude Senahú and Panzós and to include the municipality of Lanquin instead. Therefore, the final round of formative research was conducted in the municipalities that were finally selected to be included in PROCOMIDA, namely Cahabón, Carchá, Cobán, and Lanquin.

Study participants

The participants in this part of the study consisted of three groups of mothers (pregnant women and women with children under 6 months of age, mothers with children 6–11 months of age, and mothers with children 12–23 months of age), fathers of children under 2 years of age, and grandmothers. The primary language spoken by the study participants was Q'eqchi.

Methods

General survey

The general survey was adapted from *Pro*PAN. *Pro*PAN's general survey is designed to capture breastfeeding and complementary feeding practices in order to compare them to ideal practices. In addition, it includes questions about the use of MN supplements, use of health services, access to health and nutrition messages, and access and use of different media sources. The intention of these questions is to help inform the design of health and nutrition interventions. One hundred twenty general surveys were completed, with 24 per community (8 with pregnant women, 8 with mothers of children aged 6–11 months, and 8 with mothers of children aged 12–23 months).

Semi-structured interview with mothers, fathers, and grandmothers

The semi-structured interviews were used to collect information from all five of the different groups described above. These interviews were based on the semi-structured interviews created for *Pro*PAN. The original interviews were designed to gather information on IYCF practices from mothers of children 6–23 months of age, to understand the reasons behind these practices and to identify barriers and facilitators for changing these practices in a way that would bring them closer to the ideal practices. To facilitate this, the *Pro*PAN semi-structured interview is organized around ideal practices and seeks to compare these ideal practices with actual practices and to determine the factors that prevent or facilitate the adoption of ideal practices. We adapted this interview guide to fit our purposes by making two primary changes. First, we added questions to this instrument to address a number of additional topics, including feeding during illness; knowledge and use of MN supplements and fortified products; knowledge and practices related to the use of preventive and curative health services during pregnancy, postpartum, and childhood; maternal diet and nutrition during pregnancy and lactation; and household food security. In addition, we adapted the questions in the revised semi-structured interview to gather complementary information from three additional groups: pregnant women and mothers of children under 6 months of age, fathers, and grandmothers. We included these additional groups since they may have different beliefs and perceptions, which may either facilitate or hinder adoption of recommended practices. Fifty semi-structured interviews were completed, 10 in each community (of which 2 were with pregnant women or women with children under 6 months of age, 2 with mothers of children 6–11 months of age, 2 with mothers of children 12–23 months of age, 2 with grandmothers, and 2 with fathers).

Focus group discussions

IFPRI developed focus group discussion guides around four central themes: diet during pregnancy and lactation, prevention of anemia, health- and nutrition-related messages, and access to health services as well as perceptions and beliefs about these services. These topics were not extensively covered in the original instruments adopted from *Pro*PAN. In addition, these topics have not received as much attention in previous investigations in Guatemala as opposed to IYCF practices, which have been more extensively covered in the past. We specifically utilized the focus groups to look more in-depth at these issues, which are central to the SBCC strategy and the health-strengthening activities. Due to their structure, focus groups have the potential of adding an additional layer of understanding by revealing practices, perceptions, and beliefs that people may not be as comfortable sharing one-on-one or may not remember before being prompted by someone else's comment on a particular topic. Focus groups were conducted separately in each of the five communities for three groups: a mixed group of pregnant women and mothers of children 0–23 months of age, fathers of children 0–23 months of age, and grandmothers. Fifteen focus groups were completed (one of each type in each community) with 6–10 participants in each one.

Recipe trials

Recipe trials were conducted in two parts using a protocol adapted from *Pro*PAN (recipe creation exercise) with a few modifications. In the first set of the recipe trials, mothers met to discuss the foods and recipes that they commonly give their infants and young children. They were then provided with some information about nutrient-rich foods, such as foods that are rich in vitamin A, iron, protein, and energy (with reference to some of the foods that they listed as common complementary foods for children 6–23 months of age). Mothers were then asked to suggest ways in which they thought their recipes could be modified to incorporate some of these foods. The selected modified recipes were then prepared the following day and fed to children either 6–11 months of age or 12–23 months of age. The acceptability of the recipes for the mothers and young children as well as the feasibility of preparing the recipes at home was then assessed. The common, modified, and final recipes were also compiled in comparative charts that allow one to view changes in ingredients discussed and decided on by the groups of mothers; these can be found in **Appendix 2**. In the second set of recipe trials, we aimed to test nutrient-rich recipes incorporating the CSB that will be provided by the program. This set of trials followed the same protocol as the first set of recipe trials, with the exception that the recipes were predetermined based on recipes from other programs that have distributed CSB in Guatemala. The tested CSB recipes are provided in **Appendix 3**.

Data collection

The data for the general survey, semi-structured interviews, and focus group discussions were collected in November and December 2009 by seven local experienced fieldworkers who were fluent in both Spanish and Q'eqchi. All of the fieldworkers had prior experience working in Alta Verapaz and most had experience collecting health- and nutrition-related information. The data collection team participated in an intensive week-long training period with four of the team members focusing on the semi-structured interviews and focus group discussions with community members and the other three focusing on the general survey. Based on prior experience in the area, the interview guides that were used with the community members were taught to the team in Spanish and then the team worked together to agree on the translations into Q'eqchi. Selected translations were then validated with verbal back-translations. During the training period, all of the instruments were pilot-tested and adjustments were made as necessary.

The first set of recipe trials were conducted in February and March 2010 and the second set in September 2010 by a separate group of fieldworkers (fluent in both Q'eqchi and Spanish) led by the PROCOMIDA nutritionist. These fieldworkers participated in a week-long training in February 2010 (and refresher in September 2010), which included practical demonstrations and pilot tests of each of the components of the recipe trials. The recipe trials were conducted in Q'eqchi. The comments and observations noted during the trials as well as the comments from the mothers during the focus group discussions following the taste tests were transcribed by the fieldworkers directly into Spanish. The Spanish transcriptions were used for analysis.

The semi-structured interviews, focus group discussions, and general surveys with the community members were all conducted in Q'eqchi. The interviews were recorded at the time of the interview, and the interviews and focus group discussions that were conducted in Q'eqchi were then translated and rerecorded in Spanish by the person who conducted the interview as soon as possible following the interview. These Spanish recordings were later transcribed and the Spanish transcriptions were used for analysis.

Data analysis

General survey

The data collected in the general survey were analyzed using SPSS version 18. The primary goal of the analyses was to determine the percentage of children being exposed to optimal IYCF practices. These analyses were conducted for the group of mothers as a whole and then separately for each group of mothers (pregnant women and mothers with children under 6 months of age, mothers of children 6–11 months of age, and mothers with children 12–23 months of age). The results are presented as percentages.

Semi-structured interviews and focus group discussions

A qualitative data analysis software (Nvivo) was utilized to analyze the semi-structured interviews and focus group discussions. A code list was first created according to the topics of interest, namely the current practices and beliefs and perceptions about the different practices. In addition, codes were created for any yes/no questions so that counts of the number of community members with specific knowledge or engaged in specific practices could be made at the end of the coding process. The transcripts from each of the semi-structured interviews and focus group discussions were then coded in Nvivo according to the code list. Finally, all of the coded transcript material was read and written up within a framework of the key, overarching issues addressed in the formative research, engaging specific subthemes that arose out of the coding process. During the initial analysis, all groups of interviews (the three groups of mothers, fathers, or grandmothers) were kept separate to draw out any differences and to explain similarities in responses. Where little difference was found, findings were fused into a more general analysis and any comments specific to one of the groups noted.

In addition, we analyzed the information following a method similar to one suggested in *Pro*PAN. In this analysis, ideal practices are compared to actual practices and then the barriers and facilitators to following these factors are identified. This is done using a matrix for each key practice, with columns for ideal practices (practices to promote), current practices (practices in Guatemala), facilitating factors, and barriers that may affect the capacity for behavior change. These tables are presented within the text for each of the main topics (diet during pregnancy and lactation, breastfeeding, and complementary feeding).

Recipe trials

The recipe trials were analyzed using both qualitative and quantitative methods. The transcripts from the trials were examined to analyze the acceptability of the recipes for mothers and children and the feasibility of preparing these recipes at home. These transcripts consisted of both observations by field staff and post-trial tasting feedback by mothers. Key points about the acceptability and feasibility of preparing these recipes were summarized and are described in the text.

The analysis of the nutrient content of these recipes is based on the current WHO recommendations for complementary feeding [1]. The adequacy of the recipes was assessed for energy, protein, iron, vitamin A, and zinc. NutriSurvey for Windows 2007 version (c) [2] was utilized for the analysis of the nutrient composition of the recipes (in conjunction with additional food composition databases when necessary from Guatemala and FAO). The results from these analyses were then exported to Excel, where nutrient density was calculated per average portion (based on the average amount consumed by each age group during the recipe trials) and per 100 kcal. The number of portions per day that would be required to meet children's energy needs (i.e., feeding frequency) was then estimated for children 6–8, 9–11, and 12–23 months of age based on an assumed average breast milk intake [1].

5.3. Results

Diet during pregnancy and lactation

Foods that should be eaten during pregnancy and lactation

All groups emphasized the importance of women eating vitamin-rich foods, including herbs, vegetables, fruits, and meats during pregnancy and lactation. They also agreed that foods that "come from the earth," namely *hierbas*, fruits, and vegetables (broccoli, carrots, radishes, cabbage) are healthiest for pregnant and lactating women. Many mothers, fathers, and grandmothers also mentioned a variety of broths and soups, beans, potatoes, rice, meat (beef and chicken), cheese, *Incaparina*, and *mosh*[11] as being good foods for pregnant and lactating women. During their last pregnancies, the mothers interviewed ate whatever variety of foods they could access, many mentioning herbs, fruits, *atoles*, broths, meat, vegetables, and beans, as well as foods to satisfy cravings (e.g., for fruit); however, they could not always eat what they desired, since they lacked money to buy many food items. Most fathers interviewed believed that their wives' diets did not change significantly during pregnancy. Whether their diets *should* change is a different topic, however, with fathers noting that pregnant and lactating mothers should eat special foods, but access depends on available money, since most of these special foods could not be found within or near their communities anymore (e.g., herbs); thus, women's diets still consisted primarily of tortillas during pregnancy. Mothers also noted that their diets were primarily constrained by economic resources, money, and a resulting lack of access to nutrient-rich foods.

The only difference noted by the mothers interviewed between diet during pregnancy and lactation is the lack of desire to eat during pregnancy. During lactation (like pregnancy), mothers, grandmothers, and fathers believe that lactating women should eat a variety of foods to be able to produce sufficient "good" milk for their children and for their own health. Fathers believe in the importance of consumption of a variety of foods, rather than limiting certain foods during lactation, but access is inhibited by their ability to buy these products, as well as the "drying up" of resources in their communities.

Foods to avoid during pregnancy and lactation

In general, people had different opinions about which foods mothers should avoid during pregnancy and lactation. Many stated that mothers should eat whatever is available to them during pregnancy and lactation and emphasized the importance of dietary diversity. However, some people mentioned that certain groups of foods that are perceived to be unhealthy should be avoided during pregnancy and lactation, including those sold in the local *tiendas* and sweets. "Cold" foods were also mentioned as foods that should be avoided and include things such as ice cream, certain drinks, pork, and beans; it is believed that the consumption of "cold" foods during pregnancy can harm the baby. Other (individual) mothers mentioned that frozen chicken, tomato that can be bought within the community, and *ichintal*[12] should be avoided during pregnancy.

Many people feel that no foods should be avoided during lactation, while others do not know whether there are foods that should be avoided during lactation. Some cited sweets and "cold" foods as specifically harmful during lactation, and one cited beans. It is believed by some that the consumption of "cold" foods during lactation can make the mother produce cold milk that can hurt the baby. One mother explained the problem with cold folds: "When one eats cold foods, the breast milk is very cold, it hurts the child, and he begins to cry because he gets a stomachache." It is also believed that sweets can upset the child's stomach and thus should be avoided during lactation.

[11] *Mosh* is a porridge.
[12] *Inchita* is a root of chayote (a vegetable).

Mothers and fathers also mentioned that pregnant and lactating women should avoid cigarettes, alcohol, and some medicines that can damage an unborn child, although no specific medicines were mentioned.

Quantity of food that should be eaten during pregnancy and lactation

The majority of mothers reported that they usually eat the same quantity of food or more food when they are pregnant, depending on how much they can access. However, some mothers reported that they experienced a loss of appetite during pregnancy, especially in the first few months, resulting in eating less food than usual during these first few months. Some explained that they changed what they ate during pregnancy because of an increased desire to eat certain foods, because certain foods made them particularly nauseous (e.g., beef), to increase the strength of the child, or because they ate more. Fathers gave a range of opinions in regards to quantity eaten during pregnancy, from less—because women have less desire to eat—to more, for the strength of the mother and growth of the baby—and the same as when they are not pregnant. Grandmothers did not agree on the amount that should be eaten during pregnancy, with some saying more—in order to give the growing child good nutrition— to some saying less—because women lose their appetites during pregnancy—and some saying the same—emphasizing that women should not eat too much or their children will be large and thus difficult to deliver.

Mothers explained that their diets changed during lactation and that they would like to eat more during lactation, though this depended on whether they had sufficient money to purchase additional food. Mothers highlighted the importance of additional nutrition both for their children's growth and to produce "sufficient" milk. Fathers expressed concern during interviews and focus groups regarding their wives' ability to receive decent nutrition while breastfeeding, emphasizing that they need to eat well enough to have vitamins, strength, and "sufficient" milk. The majority of fathers did not think that their wives' diets changed during lactation, though some emphasized that they should, when other types of foods are available.

Barriers to optimal diets during pregnancy and lactation

The primary barriers to behavior change related to maternal diet during pregnancy and lactation fall into two primary categories: beliefs and external factors. The beliefs that may be a barrier to behavior change primarily revolve around the use of certain foods during pregnancy and lactation, especially "cold" and sweet foods. Although the avoidance of some of the foods that fall into these categories may actually be a positive diet choice, the avoidance of others that fall into these categories, such as pork, beans, and bananas, may contribute to dietary deficiencies if these foods are available to the mother (and others are not) and she chooses not to eat them based on beliefs. In addition, broths are seen as a particularly good choice for pregnant and lactating mothers, but broths are likely to have limited nutritional value and may make the mother feel full without satisfying her nutrient requirements. The most significant barrier to a high-quality diet during pregnancy and lactation, however, appears to be the lack of economic means to buy nutritious foods, such as meat, fruits, and vegetables, and fortified products, such as *Incaparina*. In addition, the disappearance of locally available foods (fruits and vegetables that could previously be foraged for, and fish in local rivers or streams) was a commonly cited barrier to obtaining optimal foods for pregnant and lactating women. The common practices, beliefs, attitudes, and perceptions are summarized in **Table 5.2** along with the perceived barriers and facilitators to behavior change related to maternal diet during pregnancy and lactation.

Table 5.2. Adequate diet during pregnancy and lactation

Practices to promote	Practices in Guatemala	Facilitating conditions for behavior change	Issues that may affect capacity for behavior change
• Increase consumption of nutrient-rich foods during pregnancy. • Increase the amount of food during pregnancy. • Increase consumption of nutrient-rich foods during lactation. • Increase the amount of food during lactation.	**Positive** • Women eat a variety of foods, particularly herbs and vegetables. • Although women may initially feel ill and eat less during pregnancy, most eat the same or more during both pregnancy and lactation.	**Beliefs** • A varied diet and vitamins will produce "good" breast milk. • Herbs and vegetables are seen to be particularly good for pregnant and lactating women. • Mothers cannot provide "sufficient" breast milk without good nutrition. **Attitudes** • There is a desire for more information about promising practices.	**Beliefs** • "Cold" foods are seen as damaging (these may include beans, pork, ice cream, and sweets, but vary across the community). • Eating specific foods (e.g., sweets, bananas) during lactation will upset the child's stomach. • All snack foods and soft drinks that can be bought at the local *tienda* are bad. • Broths are a nutritious food choice. Eating too much during pregnancy will make delivery difficult or impossible because the child may be too large to deliver. **External** • The cost of foods is too high. • Locally available foods have disappeared.

Breastfeeding

Initiation of breastfeeding

The majority of mothers fed their children breast milk within the first few hours of birth, but only 53 percent did so within the first hour. This practice is supported by the majority of grandmothers and fathers who believe that children should be fed immediately after birth. However, some of the respondents in the semi-structured interviews (mothers, fathers, and grandmothers) explained that some mothers wait for a few hours or days to initiate breastfeeding, with four primary reasons cited: the baby rejected the breast (refusing to attach or falling asleep shortly after birth), the milk did not "drop" (or come in), there was not enough milk to breastfeed immediately, and the child did not ask for the breast.

Use of prelacteal feeds

Breast milk was the first liquid given to the majority of children (94 percent). However, a few children received other liquids, including water, canned or powdered milk, and cornmeal as an atole. The majority of mothers did not give prelacteals to their infants (102 out of 108 who participated in the general survey). The two mothers that reported giving their children water prior to breastfeeding in the semi-structured interviews stated that they did this to "cleanse" the stomach. One of these mothers received advice to give water from a nurse, while the other learned this practice from her own mother. Regarding advice on avoiding prelacteals, the majority of mothers received no such recommendations. However, one mother explained she received advice to avoid prelacteals at trainings she attended, and another explained that she had learned from the radio to exclusively breastfeed and avoid prelacteal feeds. The majority of fathers and grandmothers stated that prelacteals should be avoided and fathers mentioned that they had received advice on the avoidance of prelacteals from the hospital, the CC, the local health staff (midwives and CHWs), and family members. It is unclear why fathers seem to have received this advice while mothers reported that they had not.

Feeding of colostrum

Most mothers, fathers, and grandmothers encourage the feeding of colostrum, and 93 percent of the mothers that participated in the general survey reported that they gave colostrum to their children. Some mothers described producing colostrum as soon as a child was born, while others said they had to wait for up to 2 days. Two of the 10 grandmothers reported that colostrum should be discarded, and one mother reported that she did not give her child colostrum because she had heard it can cause children to vomit. Those who supported giving colostrum stated that the feeding of colostrum "cleanses" the stomach and supports the health and strength of the child.

On-demand breastfeeding

All mothers interviewed, with the exception of one, reported that they feed on-demand rather than according to a schedule, stating that they feed their children when the child cries or "asks" for it. Mothers emphasized that they need proper nutrition to produce "sufficient" milk and to feed their children on demand. The number of times that the mothers reported feeding during the day and night varied, with the majority breastfeeding 4–9 times during the day and 1–6 times during the night. The only obstruction to breastfeeding noted by these mothers was work outside of the home, though this was only reported among mothers of children 12–23 months of age. Feeding on-demand appears to be the norm in these communities, and although a few grandmothers reported that a child should be fed according to a schedule in order to prevent illness, specifically diarrhea, only one mother reported feeding according to a schedule.

EBF until 6 months of age

According to the results from the general survey, the prevalence of EBF until 6 months of age among children 6–23 months of age was about 54 percent; however, this includes a few children (10 percent) who continued to exclusively breastfeed past 6 months of age (**Table 5.3**). The majority of mothers, fathers, and grandmothers interviewed expressed support for EBF until 6 months of age to promote the health, strength, and growth of their children. Furthermore, some stated that they had been taught that giving foods or other liquids before 6 months of age could make their children ill. While the majority of participants supported this practice in theory, they also explained that good maternal nutrition is necessary for EBF, specifically for producing "sufficient" milk. Those who believe a child under 6 months of age should be given water or other liquids emphasized the need to "quench thirst" or to supplement a child whose mother does not produce "sufficient" milk. Our analysis revealed that one of the most common first liquids that children are given is coffee. Some of the other common first liquids reported were the leftover water from soaking maize (*agua de masa*) and a locally produced fortified processed complementary food (*Incaparina*).

Table 5.3. The age at which children first receive liquids other than breast milk

Age group of children whose mothers were interviewed	(n)	0–3 months n (%)	4–5 months n (%)	6 months n (%)	Over 6 months n (%)	Still on EBF n (%)
6–11 months of age	40	5 (13)	11 (28)	18 (45)	4 (10)	2 (5)
12–23 months of age	39	7 (18)	12 (31)	17 (44)	4 (10)	--
Total	79	12 (15)	23 (29)	35 (44)	8 (10)	2 (2)

Continued breastfeeding until 2 years of age

Breastfeeding until at least 2 years of age is the norm in Alta Verapaz. All participants in the general survey (mothers with children under 2 years), except one mother, reported that they were currently breastfeeding, and 98 percent of the mothers in the children 12–23 months of age group were still breastfeeding. There was also a generalized belief that mothers should breastfeed until 2 years of age. The

only obstacles to continued breastfeeding that were mentioned were mothers having to work away from home (which was not common among the women who participated in this research) or having pregnancies too close together. Mothers have received information that 2 years of age was the ideal time to stop breastfeeding, but were unsure about the reason why this is an optimal practice.

Use of expressed breast milk

The use of expressed breast milk in these communities is extremely rare. Very few people reported that they had used expressed breast milk or that they planned to do it. The reasons stated for not using this practice were that they did not have the necessary equipment and that expressed breast milk is very "cold" and thus could harm the child. If mothers are away from their children, then the child has to wait for her to return to eat. Only one father reported that his wife expressed breast milk and kept it in a bottle to later give his child. Grandmothers explicitly did not support this practice, mainly citing the lack of equipment and the milk becoming "cold."

Use of bottles

Mothers conferred mixed responses regarding bottle feeding. The majority of mothers of young infants said that they had not used bottles, though a few had given them to their children. However, many said that they do plan to use them after the child reaches 6 months of age (to give water or *Incaparina*, in particular). Most mothers liked having the option to bottle-feed, in that it relieves them of having to nurse as often, and fathers supported this practice, stating that it is helpful to the mother. A few mothers explained that bottles could cause illness and thus they avoided giving them to their children. Those who do use bottles wash them with soap and/or boil them with chlorinated water.

Barriers to optimal breastfeeding practices

The primary barriers to following optimal breastfeeding practices are related to beliefs about the mothers' milk being "insufficient" to provide adequate nutrition, the fact that milk does not quench children's thirst, the common use of liquids other than breast milk during illness (e.g., water to quench thirst), and the use of coffee as a treatment for diarrhea. Other less commonly mentioned barriers are the child "asking" for food, even directly after birth; pregnancies being too close together, forcing a mother to stop breastfeeding her older child; and women working outside the home (even though this is not common) (see **Table 5.4**).

Table 5.4. Promising breastfeeding practices

Practices to promote	Practices in Guatemala	Facilitating conditions for behavior change	Issues that may affect capacity for behavior change
• Breastfeed within the first hour. • Avoid the use of pre- and post-lacteal feeds. • Feed colostrum. • Breastfeed on demand day and night. • Exclusively breastfeed until 6 months of age. • Feed breast milk with the recommended frequency. • Use expressed breast milk. • Continue breastfeeding until 2 years of age. • Do not use baby bottles.	**Positive** • Most breastfeed within the first hours of birth. • Most avoid prelacteal feeds. • Most feed colostrum. • Most breastfeed on demand day and night. • Half exclusively breastfeed to 6 months of age. • Most breastfeed until 2 years of age. **Non-optimal** • Many do not exclusively breastfeed to 6 months of age, though some believe they do. • Some exclusively breastfeed beyond 6 months of age. • Continued breastfeeding ranges from 9 months to 6 years of age. • Some use baby bottles. **Not enough information** • Use expressed breast milk. • The perceived frequency of breastfeeding varies greatly, from two to 40 times per day.	**Beliefs** • Breastfeeding is vital for child health. • EBF is cost-effective. **Attitudes** • Everyone who was interviewed was very supportive of breastfeeding. • Mothers are willing to follow promising practices, with sufficient training and advice.	**Beliefs** • Without good nutrition, "insufficient" breast milk is produced. • The child has to demonstrate hunger, even to receive colostrum. • Breast milk does not quench thirst. • Children should be fed according to a schedule (grandmothers believed this). • Expressed breast milk is "cold" and thus harmful for the child. • Water and other liquids do not interfere with EBF. • There is concern that pregnancies too close together can prevent continued breastfeeding to 2 years of age. **Practices** • *Atoles* are introduced when it is perceived that "insufficient" breast milk is being produced. • Coffee is used to treat diarrhea. • Working moms use baby bottles.

Complementary feeding

Initiation of complementary feeding

In the semi-structured interviews, mothers with children under 6 months of age had not yet given complementary foods. They explained, as pregnant women did, that first foods would be given to their children between the ages of 6 months and 1 year. However, the data from the general surveys revealed that some mothers had started giving their children food between 4 and 5 months, and two had started at 3 months (**Table 5.5**). The majority (87 percent), however, reported having started at 6 months or older. In the semi-structured interviews, mothers of children 6–11 months of age reported that the first foods they gave their children were torn apart tortillas, soup (with tortilla), rice water, cooked banana, broth with herbs, cow's milk, and *Incaparina*. The reasons for choosing these foods varied: advice (from husbands), because the child began asking for food, or for the health of the child. For mothers of children 12–23 months, first foods given to children included beans, torn apart tortilla, tortilla with cheese, cooked vegetables, eggs, bean soup, and noodle soup. Although there was some variation in the reported first foods in the semi-structured interviews, the results from the general surveys revealed that the majority of mothers gave broths and soups as the first foods.

Table 5.5. Age at which children were given their first food

	n	3 months n (%)	4–5 months n (%)	6 months n (%)	Over 6 months n (%)
6–11 months of age	37	2 (5)	6 (16)	21 (57)	8 (22)
12–23 months of age	40	0	3 (8)	21 (53)	16 (40)
Total	77	2 (3)	10 (13)	43 (56)	24 (31)

Quantity of food, frequency of feeding, and consistency of foods

Pregnant women and mothers with children under 6 months of age plan to begin complementary feeding by giving a small amount of food—a tablespoon or a small cup—three to four times per day. The amount of food that mothers reported giving children 6–11 months of age varied from 2 to 9 tablespoons per day. Mothers of children 12–23 months of age reported feeding their children a large piece of tortilla or a few tablespoons of food at each meal (usually three to four times per day).

When asked if they could increase quantity and frequency of feeding, mothers gave varying responses. Some said that they would diversify the foods they bought for their child if they had more money, whereas many said that their children are used to eating a small amount at a frequency of three times per day, or will ask for more food when they want it. Some people also expressed a fear that increasing the feeding amount and frequency could cause illness, especially if the increase was not gradual. One mother had specifically been told by her midwife that she should not feed her child more than three times per day.

Consistency of complementary foods

In terms of food consistency, the majority of mothers reported a preference for giving their children thicker foods, though a few would advise their friends against giving young children thick foods. Fathers and grandmothers also preferred giving their children or grandchildren thick foods, though some fathers also believed that thicker foods should only be given to children as they got older (between 1–2 years of age). Some grandmothers expressed wariness about giving thick foods, believing that the stomach needs to first be prepared with water or watery substances.

Use of ASF

On average, the mothers, fathers, and grandmothers that were interviewed indicated that their children (or grandchildren) 6–24 months of age receive meat, usually chicken or beef, one to two times per week. While mothers and fathers believe that having more money would allow them to buy more meat, many explained that they feel giving their children more meat is unhealthy and would prefer to feed the child additional fruits and vegetables. During the recipe trials it was also noted that meat was often not given to young children, with mothers explaining that their children were not used to eating this type of food or that they should not be eating meat (including soft organ meats) until after 1 year of age.

Foods to avoid giving to young children

All of the groups interviewed agreed on the majority of the foods that were considered bad for children and should be avoided. Among these were foods sold in the *tiendas*, such as chips and cookies; "foods without vitamins;" coffee; and too much meat. A few people also mentioned other foods including farmed chickens, tortillas, *agua de masa* (leftover water from soaking maize), *jocote de marañón* (a fruit similar to mango), butter and oil, and "harsh" foods (including beef). One mother also mentioned that *Incaparina* could give children diarrhea.

Responsive feeding

In interviews, participants explained support of children while eating as including sitting with the child, directly feeding/putting food in the child's mouth, taking apart food to make it easier to eat, and diversifying food options to encourage the child to eat. The majority of mothers, fathers, and grandmothers that participated in the semi-structured interviews believed that children should receive support when eating complementary foods. These reported beliefs were complemented by the results from the general survey, which revealed that 72 percent of mothers of children 6–11 months of age (26/36) and 80 percent of mothers of children 12–23 months of age (32/40) surveyed reported that they practice responsive feeding (either using animations, helping the child eat, or talking to the child to convince him or her to eat). Mothers, fathers, and grandmothers all identified trouble eating as a sign of illness (e.g., leaving food on the plate, a complete refusal to eat).

Feeding during illness

Mothers, fathers, and grandmothers explained that children lost their appetites when ill. In response, many said that they focused on trying to give their children (or grandchildren) liquid or semi-solid foods, such as breast milk, soup, *atol de mosh*,[13] juice, and cooked bananas when they were sick. While the amount of liquids given during illness varied, many mothers reported breastfeeding their children more frequently when they were ill, though some said that they would give less water and breast milk. All of the groups interviewed described looking for different types of food so children did not lose interest in eating and reported giving a variety of foods to sick and recovering children, including breast milk, soup, *atol*, juice, banana, coffee, plantain, cabbage, carrot, herbs, milk, *Incaparina*, eggs, bread, meat, tortillas, rice, chicken broth, and pineapple. Although mothers mentioned preferring liquid and semi-solid foods to solid foods during illness, fathers and grandmothers specifically stated that foods such as chips, coffee, chilies, and "harsh" foods should also be avoided during illness. While some people mentioned the avoidance of coffee during illness, others specifically mentioned coffee as a treatment for illness. In general, mothers and fathers reported feeding sick or recovering children less frequently, whereas grandmothers emphasized the importance of frequent attempts at feeding a child recuperating from illness. Most encouraged children to eat "little by little" when recovering from illness. Grandmothers recognized problems eating when children were ill, in particular when they were sick to their stomachs and had diarrhea. When children had trouble eating, they tried to give them something they liked to eat. If a child refused to eat, the most common response was to buy medicine or bring the child to a health center or CC, although others cited trying to feed the child breast milk or give him or her water.

Barriers to optimal complementary feeding practices

The primary barrier reported in regards to following optimal complementary feeding practices is the availability and access to foods (**Table 5.6**). Though some participants stated that they would not increase the amount of food, or meat in particular, believing that this could increase illness, most participants expressed a willingness to increase the amount, variety, and quality of foods given to their children if they had the resources to do so. All groups interviewed also mentioned cost as a barrier to obtaining special foods for children that are ill or recovering from illness and stated that they would use these special foods, such as *Incaparina*, more often if they had the money available. While there were some reports of "cold" or "harsh" foods being bad for children, very few people mentioned these during the interviews.

[13] *Atol de mosh* is a porridge.

Table 5.6. Promising complementary feeding practices

Practices to promote	Practices in Guatemala	Facilitating conditions for behavior change	Issues that may affect capacity for behavior change
• Initiate complementary feeding at 6 months of age. • Increase the quantity of food and frequency of feeding with age. • Feed a variety of foods with high energy and nutrient density. • Feed ASF every day. • Practice responsive feeding. • Give more liquids, including breast milk, during illness and recovery. • Offer diverse foods often during illness and recovery. • Feed more food during recovery. • Provide special foods, if necessary.	**Positive** • In general, the quantity of food and frequency of feeding increases with age. • Children are fed a variety of foods when available. • There is a general preference for thicker foods. • 72–80% of mothers practice responsive feeding. • A variety of foods and special foods are provided during illness and recovery, when possible. **Non-optimal** • Children begin complementary feeding after 6 months of age. • Children are fed meat one to two times per week on average. • Children are given coffee. • Various amounts of food and liquids are given during illness and recovery, i.e., some are given more and some less. **Not enough information** • Not enough is known about the quantity of food given and the frequency of feeding.	**Beliefs** • Food and vitamin variety is important. • Children should receive support while eating. • Foods that "come from the earth" (e.g., fruits, vegetables) are best for children. • The importance of feeding for recovery from illness is recognized. **Attitudes** • There is a willingness to learn from health professionals (especially from outside the community). **Knowledge** • Some mothers expressed knowledge that coffee is bad for children.	**Beliefs** • Feeding more than four times a day will cause illness.[a] • Feeding more meat will cause illness. • Some nutritious foods are perceived as "bad" for children (such as beef). • "Cold" foods are seen as "bad" for children (such as beans, pork, ice cream, or "sweet" foods). • Stomachs should be prepared with watery substances. • Liquids and soups are good for recovery from illnesses. **External** • The cost of food (especially meat and other high-quality foods) is a factor. • The availability of local foods is limited.

[a] However, if children are receiving breast milk, feeding four times per day is sufficient.

Recipe trials

As mentioned above, the recipe trials were conducted in two parts. The primary goal of the first set of recipe trials was to improve the nutrient and energy density of commonly used recipes for complementary foods. A secondary goal of the first set of trials was to give mothers general guidelines on how to increase the energy and nutrient densities of complementary foods for their young children with minimal impact on the overall cost or time for preparation of these modified recipes. In the second set of recipe trials, we aimed to test nutrient-rich recipes incorporating the CSB that will be provided by the program.

During the first set of recipe trials we found that the most commonly fed complementary foods were soups and broths. These are often accompanied by part of a tortilla; however, the soups and broths are usually nutrient-poor and do not provide enough energy or micronutrients. To increase the nutrient density of these commonly fed recipes, mothers suggested adding vegetables and eggs and other ASF.

In general, the mothers liked the modified recipes and thought that most of them could be prepared at home. However, those that required ASF or many ingredients were often cited as being more difficult to prepare on a regular basis due to the cost of purchasing the necessary foods. Although most mothers liked the recipes that included meat and were happy to feed them to their children, a few mothers with children 6–11 months of age were hesitant to give their children the meat. These mothers explained that their

children were not used to eating meat yet and would not like it or that they did not have teeth and therefore could not eat meat. Mothers were especially eager to add vegetables to the common recipes and stated that they liked the addition of theses vegetables for taste and smell, as well as for the vitamins. For the most part, mothers also felt that they could obtain the necessary vegetables to add to the recipes.

With the exception of three of the soups that mainly included additional vegetables, the modified recipes had an adequate energy density (based on the minimum energy density of 0.8 kcal per g recommended by the Pan American Health Organization (PAHO) and WHO [1]) (**Table 5.7**). In addition, all of the recipes exceeded the minimum recommended protein density (per 100 kcal) for children 6–8 months of age. The majority of the recipes also exceeded the minimum requirements for vitamin A. This was primarily accomplished through the addition of liver to recipes. None of the recipes provided an adequate amount of iron to meet the recommended nutrient density, and only one (cabbage soup with organ meats) met the recommended level of zinc.

Table 5.7. Summary of energy and nutrient densities (per 100 kcal) of recipes modified from currently fed complementary foods[a]

no		Energy density (kcal/g)	Nutrient densities per 100 kcal			
			Protein (g)	Vitamin A (µg RE[b])	Iron (mg)	Zinc (mg)
	Average recommended[c]	**> 0.8**	**1.0**	**31**	**7.5**	**1.6**
1	Chicken soup with rice	1.06	5.85	45.35	0.78	0.67
2	Liver stew	1.01	7.75	1,404.53	2.81	1.37
3	Chicken soup with organ meats	1.39	7.79	355.29	1.29	0.90
4	Beans with rice	2.33	4.28	13.44	1.31	0.46
5	Potato stew	0.92	6.02	29.77	0.69	0.53
6	*Kala*[d] soup	0.77	5.54	218.95	1.20	0.38
7	Potato with relish	0.80	9.54	1,220.88	3.00	1.55
8	Cabbage soup with organ meats	0.56	10.60	1,158.32	3.09	2.00
9	*Macuy*[e] soup	0.37	10.29	1,045.88	2.35	0.16
10	Bean soup with rice	1.44	4.38	173.17	1.53	0.61

[a] Shaded cells highlight recipes with energy or nutrient density lower than average recommended.
[b] RE = retinol equivalents
[c] Energy and nutrient densities for 6–8 month infants with an average level of breast milk intake
[d] A stem of a plant
[e] A dark green leafy vegetable

Although seven of the recipes tested had an adequate energy density, it is unlikely that these foods will be sufficient to meet children's energy needs based on the average amount of food consumed by the children that participated in the recipe trials and the current complementary feeding recommendations. The current recommendations are that children 6–8 months of age be fed two to three times per day and that children 9–23 months of age be fed three to four times per day [1]. Given these recommendations and assuming an energy density of 0.8 kcal per g and average breast milk intake, children 6–8 months of age would need to consume 83–125 g per meal, children 9–11 months of age would need to consume 94–125 g per meal, and children 12–23 months of age would need to consume 172–229 g per meal. During the recipe trials, the average amount of food that was consumed by children 6–11 months of age was 35 g, and for children 12–23 months of age it was 62 g. These average serving sizes are far less than what is needed to meet children's energy needs and would mean that children 6–8 months of age would need to be fed seven to eight times per day and children 9–23 months of age would need to be fed 11–12 times per day to meet their energy needs.

As can be seen in **Table 5.8**, using the average serving sizes from the recipe trials, only beans with rice (recipe 4) could provide enough kcal per average serving size to meet the energy requirements of these infants and young children within the recommended number of feeding episodes per day. Vitamin A needs could be met with the average serving size of the majority of the recipes; however, iron and zinc needs cannot be met with these recipes.

Table 5.8. Summary of the nutritional qualities of recipes modified from currently fed complementary foods[a]

		Nutritional qualities per portion					Portions needed for energy[b, c]		
No	Recipe name	kcal	Protein (g)	Vitamin A (µg RE[d])	Iron (mg)	Zinc (mg)	6–8 months	9–11 months	12–23 months
1	Chicken soup with rice	37.53	2.20	17.02	0.29	0.25	5.33	7.99	8.21
2	Liver stew	35.49	2.75	498.40	1.00	0.48	5.64	8.45	8.68
3	Chicken soup with organ meats	49.21	3.83	174.84	0.63	0.44	4.06	6.10	6.26
4	Beans with rice	82.40	3.52	11.07	1.08	0.38	2.43	3.64	3.74
5	Potato stew	32.39	1.95	9.64	0.22	0.17	6.18	9.26	9.51
6	*Kala* soup	48.28	2.67	105.70	0.58	0.18	7.29	10.94	11.39
7	Potato with relish	50.11	4.78	611.77	1.50	0.78	7.02	10.54	10.98
8	Cabbage soup with organ meats	35.10	3.72	406.56	1.09	0.70	10.03	15.04	15.67
9	*Macuy* soup	22.99	2.37	240.43	0.54	0.04	15.31	22.97	23.93
10	Bean soup with rice	89.68	3.93	155.29	1.37	0.55	3.93	5.89	6.13

[a] The shaded recipes represent those that were able to meet the children's energy needs within the recommended number of daily meals.
[b] Portions needed for energy are based on the average amount of food that children consumed during the recipe trials (35 g for children 6–11 months of age and 62 g for children 12–23 months of age) and assuming daily kcal needs from complementary foods for children 6–8 months of age being 200 kcal, for children 9–11 months of age being 300 kcal, and for children 12–23 months of age being 550 kcal.
[c] The recommended number of meals per day for children 6–8 months of age is two to three, and for children 9–23 months of age is three to four.
[d] RE = retinol equivalents

The recipes created with the CSB all had sufficient energy and protein density, and three of the five had adequate vitamin A content (**Table 5.9**). However, none of the recipes met the minimum requirements for iron or zinc density (per 100 kcal). Overall, the puree of egg yolk with CSB recipe appears to be the most promising in that it provides a relatively high nutrient density (2.68 kcal per g) and adequate densities of protein and vitamin A. Eggs are generally more accessible in these communities than other ASF. The bean relish with CSB (which was tested with two different groups) is also promising, especially given that beans will be distributed as one of the food commodities (family ration) through PROCOMIDA; however, this recipe is inadequate in terms of vitamin A, iron, and zinc densities.

Table 5.9. Summary of energy and nutrient densities of recipes prepared with CSB[a]

no		Energy density (kcal/g)	Nutrient densities per 100 kcal			
			Protein (g)	Vitamin A (µg RE[c])	Iron (mg)	Zinc (mg)
	Average recommended[b]	**> 0.8**	**1.0**	**31**	**7.5**	**1.6**
1	Bean relish with CSB	3.60	6.02	8.72	2.09	0.66
2	Puree of egg yolk with CSB	2.68	4.91	122.35	2.55	0.31
3	Liver tarts with CSB	1.68	4.88	778.51	1.93	0.76
4	Bean relish with CSB	2.33	6.05	22.40	2.22	0.66
5	Egg and vegetable pancakes (made with CSB)	0.86	5.39	105.86	1.98	0.36

[a] Shaded cell highlights recipes with energy or nutrient density lower than average recommended.
[b] Energy and nutrient densities for infants 6–8 months of age with an average level of breast milk intake
[c] RE = retinol equivalents

The nutritional qualities per average portion were also assessed for the CSB recipes and the numbers of portions necessary to meet energy needs (assuming average breast milk intakes and using the average amount of food consumed during the recipe trials) were calculated for children 6–8, 9–11, and 12–23 months of age (**Table 5.10**). The bean relish and puree of egg yolk with CSB are, again, the best recipes in terms of meeting children's needs, as compared to the liver tarts with CSB and the egg and vegetable pancakes. Both the bean relish and egg yolk puree with CSB can meet children's energy needs, given the average observed serving size and feeding recommendations (i.e., two to three times per day for children 6–8 months of age and three to four times per day for children 9–23 months of age). The liver tarts with CSB would be the second choice (from these recipes), although these would need to be fed with a slightly higher frequency, which may not be feasible given economic and time constraints. All of these recipes provide minimal amounts of iron and zinc (even with the use of the fortified CSB and some ASF). These limitations are unlikely to be ameliorated through recipe modifications given the economic constraints of purchasing ASF.

Table 5.10. Summary of the nutritional qualities of recipes prepared with CSB[a]

No	Recipe name	Nutritional qualities per portion					Portions needed for energy[b, c]		
		kcal	Protein (g)	Vitamin A (µg)	Iron (mg)	Zinc (mg)	6–8 months	9–11 months	12–23 months
1	Bean relish with CSB	127	7.6	11.1	2.66	0.83	1.57	2.36	2.42
2	Puree of egg yolk and CSB	95	4.6	115.7	2.41	0.29	2.11	3.17	3.26
3	Liver tarts with CSB	105	5.1	814.8	2.02	0.79	3.36	5.05	5.26
4	Bean relish with CSB	146	8.8	32.6	3.24	0.96	2.42	3.63	3.78
5	Egg and vegetable pancakes (made with CSB)	54	2.9	56.7	1.06	0.19	6.57	9.85	10.26

[a] The shaded recipes represent those that were able to meet the children's energy needs within the recommended number of daily meals.
[b] Portions needed for energy are based on the average amount of food that children consumed during the recipe trials (35 g for children 6–11 months of age and 62 g for children 12–23 months of age) and assuming daily kcal needs from complementary foods for children 6–8 months of age being 200 kcal, for children 9–11 months of age being 300 kcal, and for children 12–23 months of age being 550 kcal.
[c] The recommended number of meals per day for children 6–8 months of age is two to three and for children 9–23 months of age is three to four.

5.4. Discussion

Interview and focus group participants highlighted similar, central issues regarding maternal diet during pregnancy and lactation. Most did not discern between what pregnant women and lactating women should eat to have sufficient strength and the ability to provide their children with sufficient nutrition. While all groups interviewed emphasized women's need for a variety of foods to get all of the necessary vitamins and minerals during pregnancy and lactation, disappearing local food resources (specifically, less ability to find and collect herbs, not enough foods produced when planted, and the drying up of rivers) coupled with a lack of sufficient income severely inhibited access.

Most mothers initiated breastfeeding within the first few hours of life, though only about half initiated within the first hour. All mothers interviewed had breastfed their child at some point, most gave breast milk as the first liquid, and about half practiced EBF for the first 6 months of life. Nearly all mothers breastfed on-demand, and the majority stated that they would continue breastfeeding until 2 years of age.

According to our interviews, most children began to receive complementary foods between the ages of 2 months and 1 year, with the majority receiving their first foods of torn apart tortillas, soup (with tortilla), rice water, cooked banana, broth with herbs, cow's milk, or *Incaparina* at 6 months of age (56 percent) or after (31 percent). Mothers and fathers began by feeding children small amounts of food, including meat (usually one to two times per week), when they had sufficient funds to purchase it. Foods that "come from the earth" are considered to be healthiest for children (as well as for pregnant and lactating women, described above), whereas foods that can be bought in the local *tiendas* are considered unhealthiest. Some also perceived specific types of food, specifically those classified as "cold" or "harsh," as problematic. Some expressed concern that feeding more meat than they were currently giving, specifically, or complementary foods, more generally, could cause illness.

There is concern that up to 40 percent of children did not receive complementary foods until after 6 months of age. Previous research in Guatemala found that the most common reason that complementary foods were given late was because mothers waited for children to express interest in food [23]. This belief also came out in our current research, where mothers said that children would let them know when they wanted to start eating food or if they were hungry. This should also be addressed in the SBCC strategy, since breast milk alone is no longer sufficient to meet children's needs after 6 months of age.

Overall, soups and stews were the preferred foods of mothers for children 6–23 months, both as the recipes commonly prepared for their children and in their choices of modified recipes. Soups and stews were chosen as the modified recipe for most of the recipe trials. Though the mothers liked the modified recipes and were willing to make small changes to their preparation techniques (i.e., using less water and adding vegetables and ASF when possible), the modified recipes based on locally available foods failed to meet children's needs for energy, vitamin A, iron, and zinc.

The primary problem related to meeting the energy requirements for these children is the small amount of food that they were observed to have eaten during the recipe trials (35 g for children 6–11 months of age and 62 g for children 12–23 months of age). The current complementary feeding recommendations are that children 6–8 months of age be fed two to three times per day and that children 9–23 months of age be fed three to four times per day [1]. Given these recommendations and assuming an energy density of 0.8 kcal per g and average breast milk intake, children 6–8 months of age would need to consume 83–125 g per meal, children 9–11 months of age would need to consume 94–125 g per meal, and children 12–23 months of age would need to consume 172–229 g per meal. Clearly, the amount of food that was observed to be eaten by these children is insufficient. Based on the observed average serving sizes, children 6–8 months of age would need to be fed seven to eight times per day and children 9–23 months of age would need to be fed 11–12 times per day to meet their energy needs. Increasing feeding frequency in this way is not recommended as it is often difficult for both financial and time reasons and can also be problematic in relation to displacing breast milk intake [1].

The CSB-based recipes were more nutrient rich in general, and a few of them could meet children's energy needs within the recommendations for feeding frequency, even given the small amount of food observed to be eaten by the children that participated in the recipe trials. However, these recipes did not reach an adequate density for iron or zinc. Recipe trials conducted in Haiti demonstrated that some recipes using CSB could actually meet the iron and zinc requirements of children 12–23 months of age; however, they were not sufficient to meet the needs of children 9–11 months of age [5]. It is feasible to create recipes that would meet the energy needs of these young children; however, meeting the iron and zinc needs of young children through complementary foods is known to be extremely difficult if not impossible, even when using fortified cereal blends like CSB [5]. Meeting these needs from complementary foods would require the consumption of larger amounts of ASF. This is unlikely to be feasible due to the high cost of these foods and possibly a reluctance to feed these foods to children under 12 months of age. Given these limitations, it is likely that the provision of an MN supplement (e.g., LNS, MNP) to children 6–23 months of age could be a potentially effective strategy for filling the gaps in meeting the iron and zinc needs of these young children.

One positive result of these recipe trials was that mothers were encouraged to prepare thicker soups and stews, which could at least enhance the nutrient density of these commonly fed foods. More work should be done to find nutrient-rich alternatives to soups and stews to recommend for infants and young children in Guatemala. In addition, complementary approaches to meet children's MN requirements (e.g., iron, zinc) are needed.

Implications for the SBCC strategy

In order to identify which practices should be emphasized in the SBCC strategy, Mercy Corps, in collaboration with IFPRI and other key stakeholders, listed and ranked the different practices included in the formative research, based on a number of criteria, including potential for impact, feasibility, costs, and compatibility with beliefs and knowledge. The results from this exercise are presented in **Appendix 4**. **Table 5.11** presents this information in a different way, separating the practices into primary practices to promote and other practices to be promoted through the SBCC strategy. In addition, some of the specific issues that should be addressed related to these practices are also included in Table 5.11. The listing of a practice as an "other" practice indicates that these practices are either already going well or are well known or that the participants in the workshop saw little possibility for change due to external barriers or other barriers, such as ingrained beliefs that are unlikely to change. These practices should also be included in the SBCC strategy, but priority should be given to those practices listed in the primary practices column. Practices related to the use of MNP and LNS will also be included in Mercy Corps SBCC strategy in the areas where these products will be distributed by the program. There is definitely room for improvement in a number of behaviors related to health and nutrition, some of which can be improved through increased knowledge and acceptance by the community members; others require access to resources and therefore are unlikely to change through the SBCC strategy.

Table 5.11. Practices to promote through Mercy Corps SBCC strategy

Primary practices to promote	Other practices to promote	Specific issues that should be addressed
Maternal diet during pregnancy and lactation • Use fortified foods, including donated CSB	**Maternal diet during pregnancy and lactation** • Increase the amount of food during pregnancy and lactation • Increase the variety of foods eaten during pregnancy and lactation • Increase the consumption of nutrient-rich foods during pregnancy and lactation	**Maternal diet during pregnancy and lactation** • A good diet is important and should be encouraged but in general most mothers produce "sufficient" breast milk • The use/avoidance of "cold" and "sweet" foods • The belief that broths are a particularly good food during pregnancy and lactation
Exclusive breastfeeding • Exclusively breastfeed until the child is 6 months of age • Initiate breastfeeding within the first hour of birth • Avoid the use of pre-lacteal feeds • Avoid the use of liquids other than breast milk for the first 6 months of life	**Exclusive breastfeeding** • Breastfeed on demand day and night	**Exclusive breastfeeding** • Children should be breastfed within the first hour of birth even if the child does not "ask" for food (i.e., express hunger) • Colostrum helps prevent illness • Colostrum does not make children sick • Children need only breast milk until they are 6 months of age • Breast milk "quenches" thirst • In general, mothers produce "sufficient" milk • Other liquids and foods interfere with EBF
	Continued breastfeeding • Continue giving breast milk in addition to complementary foods to children 6–24 months of age	
Use of bottles • Avoid the use of bottles • Promote the use of cups or spoons as an alternative		
Complementary feeding • Initiate complementary feeding at 6 months of age • Give children over 6 months of age animal-source food (ASF) every day (e.g., eggs, meat) • Increase the quantity and frequency of food as children get older • Avoid giving coffee to children under 2 years of age • Avoid the use of sodas and broths • Change the consistency of foods as children get older	**Complementary feeding** • Give children diverse foods and increase diversity with age • Practice responsive feeding	**Complementary feeding** • Examples of good foods for children 6–11 months of age • Examples of good foods for children 12–24 months of age • Importance of using boiled or chlorinated water • Children under 1 year of age can eat meat that has been mashed well and made soft (e.g., mashed liver) • The use/avoidance of "cold" foods

Primary practices to promote	Other practices to promote	Specific issues that should be addressed
from soft, mashed foods to solid foods • Give children adequate amounts of energy- and nutrient-dense foods		• Promote the use of the energy-dense CSB recipes used in the recipe trials
	Feeding during illness • Give more liquids, including breast milk, during illness and recovery • Offer diverse foods during illness and recovery • Feed greater quantity of foods during recovery • Provide special foods if necessary to motivate children to eat during illness and recovery	
Use of LNS • Pregnant and lactating women with children under 6 months of age should use one package of LNS once per day • Children 6–24 months of age should be given one package of LNS two times per day • The LNS should be mixed with a small amount of food		**Use of LNS** • Importance of LNS for targeted beneficiary due to increased nutrient needs
Use of MNP • Pregnant and lactating women with children under 6 months of age should use one package of MNP two times per day • Children 6–23 months of age should be given 1 package of MNP two times per day • The MNP should be mixed with a small amount of semi-solid food after the food has been cooked and cooled to a temperature appropriate for eating		**Use of MNP** • Importance of MNP for targeted beneficiary due to increased nutrient needs
Use of micronutrient supplements and fortified products • Understand which supplements should be used with what frequency during pregnancy • Understand which supplements should be used with what frequency during the first 6 months postpartum • Understand which supplements should be used with what frequency for children 6–24 months of age		**Use of micronutrient supplements and fortified products** • Iron does not cause abortion

Primary practices to promote	Other practices to promote	Specific issues that should be addressed
Care-seeking (pregnant and lactating women) • Recognize the danger signs during pregnancy • Recognize danger signs during birth • Prepare for childbirth (i.e., have a plan for delivery) • Recognize postpartum danger signs • Attend postpartum visits with medical staff (e.g., doctor, nurse or midwife) • Get tetanus and typhoid immunization if necessary	**Care-seeking (pregnant and lactating women)** • Attend prenatal visits with a doctor, nurse or midwife • Go to health facility if there are complications during birth	
Care-seeking (children) • Recognize the danger signs of childhood illness and malnutrition • Understand how to treat diarrhea including the use of ORS and recognizing the signs of dehydration	**Care-seeking (children)** • Know newborn danger signs • Attend regular health visits • Understand how diarrhea can be prevented • Get appropriate vaccinations at the convergence center or other health facility	
Other • Understand how to prevent and treat anemia • Understand how to care for the breasts during lactation	**Other** • Understand and use promising practices related to hygiene • Understand how to prevent and treat illness	

Maternal diet during pregnancy and lactation

The key practice to promote for maternal diet during pregnancy and lactation is that these women should use fortified products such as the CSB provided by Mercy Corps. Other important practices to promote are that mothers should increase the amount and variety of foods in their diet. Two of the critical barriers for improving maternal diets, lack of money and limited access to nutrient-rich foods, cannot be addressed directly by the SBCC strategy. However, there are several beliefs that may impede mothers from obtaining adequate diets during pregnancy and lactation, which can be addressed by the SBCC strategy. Such beliefs include the avoidance of "cold" and sweet foods and limiting the quantity of food consumed to ease delivery. It is likely that some of these beliefs are harmless and some may even be positive, such as avoiding *tienda* foods and some "cold" foods, which include some high-fat and sugar foods, such as chips, ice cream, and sodas. However, there are also foods that fall into these categories, such as pork, beans, and bananas, that may be locally available but that women may choose to avoid during pregnancy and lactation. The SBCC strategy can directly address some of these beliefs in a positive way by emphasizing the different types of foods that are good for women during pregnancy and lactation and that will provide them with a well-balanced and adequate diet during these vulnerable periods. One possibility would be to conduct recipe trials for pregnant and lactating women similar to what is commonly done for young children.

Breastfeeding

The practices to be promoted in relation to breastfeeding include EBF during the first 6 months, with a special emphasis on early initiation, use of colostrums, avoidance of any liquids and food other than breast milk, avoidance of baby bottles, and breastfeeding on demand. EBF is essentially only practiced by about half of the mothers in these communities and is a behavior that could likely be improved through an effective SBCC strategy. Some of the specific aspects of this behavior that could be addressed with positive messages are the adequacy of breast milk to: 1) supply sufficient nutrients to children under 6 months of age; 2) provide sufficient energy to children under 6 months of age; 3) "quench" children's thirst; and 4) provide infants with a nutritious food during illness, which can actually help them recover. An overarching message that could be promoted through the SBCC strategy is that EBF is the healthiest and most nutritious option for children in this age range and helps children to grow, be strong, and fight infectious diseases. The fear that mothers produce "insufficient" milk can be addressed by supporting improvements in mothers' diets as well as by educating mothers about the relative stability of mother's milk, irrespective of diet (points 1 and 2 above). Though only a few mothers reported EBF past 6 months of age, this practice should also be addressed through the SBCC strategy since breast milk is no longer adequate to meet children's nutritional needs past this age [1]. The majority of mothers reported feeding colostrums; however, the semi-structured interviews and focus group discussions revealed that there was confusion about the importance of colostrums and whether or not they should be given. Clear messages about the importance of colostrum for the health of the child and for breastfeeding success should be included in the SBCC strategy, as well as messages that counter the negative beliefs (e.g., colostrum makes the child vomit, colostrum should be discarded).

On-demand feeding and continued breastfeeding until 2 years of age, on the other hand, appear to be the norm and thus do not need to be a focus of the SBCC strategy, though some messages to continue to support these optimal behaviors should be included in the SBCC strategy and can be used as positive reinforcements with mothers that already know about these optimal practice and use them successfully.

Use of bottles

The use of bottles was a primary concern during the discussions with Mercy Corps, and the importance of including clear messages regarding the importance of avoiding bottle use was emphasized. Bottle use puts children at further risk of disease, as proper hygiene or sterilization is likely to be unavailable. Therefore,

the use of cups or spoons as an alternative to bottle use was highlighted and should be included in the SBCC strategy.

Complementary feeding

The primary barrier reported to improving complementary feeding practices was the lack of resources. Again, this constraint is not one that can be addressed by the SBCC strategy. However, there are a number of practices that could be improved through SBCC, as they are not directly related to resource availability. These include practices such as the timing of introduction of complementary foods, the frequency of feeding, practicing responsive feeding, and giving children more energy- and nutrient-dense foods when available. Given that PROCOMIDA will be providing both family food rations and fortified CSB or MN supplements (in the form of LNS or MNP), the SBCC strategy can promote the use of these products along with adoption of other optimal complementary feeding practices, such as ensuring adequate quantity, quality, and consistency of complementary foods, as well as adequate feeding frequency and responsive feeding behavior.

Due to the variation in the timing of complementary feeding, the SBCC strategy should include some messages related to the importance of introducing complementary foods starting at 6 months of age as the mother's breast milk is no longer sufficient to meet the child's energy or nutrient needs beyond this age [1]. At this time, mothers should begin giving their children three to four spoonfuls of soft foods two to three times a day and then gradually increase the amount and frequency with which she feeds her child. In addition, mothers should aim to introduce a different food every 4–5 days as possible to increase the likelihood that the child's nutrient needs are being met. As much as possible, foods should be energy dense and nutrient rich, especially since young children have limited gastric capacity and high nutrient and energy needs relative to this capacity.

Two common concerns that were expressed are that introducing foods too early can cause illness and that feeding too much food will cause illness. Both of these could be true to some extent, but the context for these statements needs further investigation (i.e., foods introduced before 6 months can cause illness but should be introduced at 6 months of age, and it is possible that excess food could cause illness but it is unclear what is meant by too much food). Another less-commonly mentioned concern was that small children do not have the digestive capacity to handle heavy foods, which leads to behavior that restricts the diet by excluding foods such as beans, meat, vegetables, and eggs, all of which are nutrient rich foods that should be promoted for feeding to young children. Messages related to encouraging responsive feeding should also be included in the SBCC strategy, as 20–28 percent of the mothers surveyed do not practice responsive feeding.

During the recipe trials, there were multiple observations of mothers removing the pieces of meat from the soup and setting it aside rather than giving it to their children. When asked why they did, this some reported that the child was not used to it or did not like it. This practice should be addressed in the SBCC strategy. Though access to ASF may limit consumption, caregivers should be encouraged to give their children these foods when they are available.

Feeding during illness

Some of the key things that should be addressed in the SBCC strategy in regards to feeding during illness are increasing fluid intake during illness and recovery and encouraging children to eat both during illness and during recovery, when possible.

Use of MN supplements and fortified products

The formative research revealed varying knowledge in regards to which MN supplements should be used for pregnant and lactating women and for children 6–23 months of age. Messages about the proper use of MN supplements should be developed according to the MSPAS protocols and included in the SBCC strategy. These messages should be provided not only to the PROCOMIDA beneficiaries but should also be shared with the health staff working in the area to the extent possible. An additional important message to include in the SBCC strategy is that iron supplementation during pregnancy does not cause abortion. This particular belief was mentioned by a couple of grandmothers and could present a major barrier to the use of iron supplements during pregnancy.

Use of LNS

LNS as an MN supplement has never been distributed in Alta Verapaz. Therefore, clear instructions on the proper use of this product as well as the importance of the consistent use of the LNS need to be developed and included in the SBCC strategy. Some of the key instructions that need to be included are the frequency with which to give the supplements and that it should be mixed with a small amount of food that can be consumed by the child (or pregnant or lactating women) in one meal. Emphasis should also be placed on the importance of the food mixed with the LNS being eaten only by the target beneficiary, whether it is a pregnant or lactating women or a child 6–23 months of age.

Use of MNP

MNPs have been distributed to children in Alta Verapaz as a part of the preventive health services offered at the CCs. Although the composition of the MNP that will be used in some of the areas that PROCOMIDA will be working in is different from what is currently provided, there is at least some familiarity in the area with this type of product. The three primary topics that should be included in the SBCC strategy in relation to the use of MNP are 1) general information about the relationships between MNs and health and nutrition outcomes in pregnant and lactating women and children under 2 years of age, 2) general information about the MNPs (i.e., composition, how they are different/and or the same as other MN supplements, the potential adverse effects of the supplements as well as benefits of the supplements), and 3) specific instructions about the use of the MNPs (who should use them, how often they should use them and how they should be mixed with food).

Care seeking (pregnant and lactating women)

The primary areas to emphasize in relation to care seeking during pregnancy and lactation include recognition of danger sings (during pregnancy, during birth, and postpartum), having a delivery plan, and attending postpartum visits. In addition, messages to encourage and remind pregnant women to attend their prenatal visits should be included; however, this practice appears to be going well, as the vast majority of women reported attending their prenatal visits. Women also seem to know that they should go to a health center if there are complications during birth and the primary barriers related to implementing this practice cannot be addressed through SBCC. Mercy Corps has suggested setting up a community emergency fund to pay for transportation for high-risk deliveries or for women experiencing complications during childbirth.

Care seeking (children)

In relation to care seeking for children, the two areas that were identified as needing the most attention were the recognition of danger signs of childhood illness and malnutrition and knowledge of how to treat diarrhea, including the use of ORS and recognizing the signs of dehydration. Most of the caregivers that participated in the formative research reported taking their children under 2 years of age for preventive health visits; however, messages to encourage the continuation of this practice should be included in the SBCC strategy. In addition, information about what to expect from these visits (according to the MSPAS

protocols) should be included so that caregivers are well informed and can ask for services that their children need (e.g., vaccinations, MN supplements).

5.5. Conclusion

Overall, the results from the formative research were consistent with other investigations related to IYCF practices that have been conducted in Guatemala [23]. In this study as in others, lack of economic means and related lack of access to nutrient-rich foods was the most commonly stated barrier to following promising practices in regards to the quantity and quality of food consumed by pregnant and lactating women and children under 2 years of age. In addition, some of the other commonly held beliefs that seem to be pervasive in Guatemala and that were found among the participants in this study in Alta Verapaz included the possibility that mothers cannot produce "sufficient" milk and that breast milk does not always "quench" a baby's thirst. Both of these beliefs often inhibit EBF as mothers decide to give their children other liquids or foods to satisfy their appetite and thirst. Complementary feeding practices and related beliefs were also found to be less than ideal. Some of the specific challenges revolve around mothers' preference for giving their young children small amounts of soups and stews as complementary foods. The recipes tested in the recipe trials revealed that these types of foods, including some that included CSB, generally did not allow children 6–23 months of age to meet their energy and MN needs, given the (small) amounts that they consumed. It may be possible to meet energy needs through improved recipes, but meeting some of the MN needs (e.g., iron, zinc) will likely require the provision of an MN supplement such as MNP or LNS. In general, the people of Alta Verapaz that participated in this research expressed an overwhelming willingness to learn about and adopt promising IYCF practices. They also expressed knowledge related to the importance of nutrition and the prevention of illness to help pregnant and lactating women and their children to be strong and healthy. Most stated that they would follow advice given by experts, including health personnel. All of these factors create a facilitating environment in which to implement an effective SBCC strategy.

Mercy Corps SBCC strategy will likely be most successful if they are able to put an emphasis on those behaviors that seem to have the most room for improvement and that people will be able and willing to adopt. In addition, adoption of promising practices is likely to be increased if the specific beliefs and perceptions that were expressed as barriers to following promising practices are addressed in the SBCC strategy. Pregnant and lactating women, mothers of children 6–23 months of age, fathers, grandmothers, and health staff should all be target populations for the SBCC strategy. All of these populations are eager to receive more training on these topics, and though there is a good deal of knowledge on a number of topics, there is still room for improvement in a number of areas, as indicated from this research. To be most successful, the SBCC strategy should employ a number of different methods for delivering the key messages, such as through small group meetings, radio spots, recipe trials, and illustrated guides that can be given to health workers to remind them about the important points related to key topics.

To document the success of the SBCC strategy, it will be essential to examine changes in mothers' (and potentially other caregivers') knowledge related to some of the key messages promoted through the SBCC strategy as well as to examine the adoption of related practices. This will be done both through the longitudinal study being conducted by IFPRI as well as the operations research.

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Appendix 1. List of general and specific topics to be covered by the formative research to inform the SBCC strategy for PROCOMIDA

Primary topics	Specific topics	Methods
General breastfeeding	• Use of bottles • Problems with breastfeeding • Expression of breast milk	• General survey • Semi-structured interview
EBF	• Pre-lacteal feeds • Timing of the initiation of breastfeeding/colostrum • Use of other liquids	• General survey • Semi-structured survey
Continued breastfeeding	• Duration of breastfeeding	• General survey • Semi-structured survey
Responsive feeding	• Perceptions and beliefs related to who should be involved in feeding and how they should be involved	• General survey • Semi-structured survey
Complementary feeding	• Timing of introducing different foods • What foods (e.g., diversity, ASF) • How much food • How many times per day • Consistency	• General survey • Semi-structured survey
Use of bottles	• Use of bottles	• General survey • Semi-structured survey
Use of MN supplements and fortified products	• Knowledge about fortified products, such as Vitacereal and *Incaparina* • Knowledge about MN supplements, including *Chispitas* • Use of these products	• General survey • Semi-structured survey • Focus groups
Feeding during illness	• Breastfeeding • What foods are given (e.g., how do feeding patterns change, are there special foods) • Use of ORS	• General survey • Semi-structured interview
Maternal diet during pregnancy and lactation	• Changes in dietary patterns including the types and quantity of foods and beliefs about the value of different foods for pregnant and lactating women • Use of MN supplements and fortified products	• Semi-structured interview • Focus group discussion
Care seeking (pregnant and lactating women)	• Danger signs during pregnancy • Seeking antenatal care • Preparation for child delivery • Tetanus and typhoid immunizations • Postpartum care	• General survey • Semi-structured interview • Focus group discussion
Care seeking (children)	• General danger signs of childhood illness • Attending AIEPI/AIN-C health visits • Diarrhea prevention and treatment • Signs of dehydration • Immunization	• General survey • Semi-structured interview • Focus group discussion

Primary topics	Specific topics	Methods
Other	• Hygiene • Prevention and treatment of illness • Prevention and treatment of anemia	• Semi-structured interview • Focus group discussion
Delivery channels for health- and nutrition-related messages	• How, what, when, and where do people get health- and nutrition-related messages • What do they understand form them • What do they believe are the best ways to receive these messages (i.e., easiest to access and understand)	• General survey • Semi-structured interview • Focus group discussion

Appendix 2. Common, modified, and final recipes for complementary foods for children 6–11 months of age and 12–23 months of age in Cahabón, Carchá, Cobán, Panzós, and Senahú[14]

Cahabón: Recipes for children 6–11 months of age

Recipe #1		
Ingredients	**Common: bean broth with egg and potato**	**Modified: beans with egg and potato**
1	Bean broth	Bean
2	Egg	Egg
3	Potato	Potato
4	Oil	Oil
5	Tortilla	Tortilla
6	Salt	
7	Onion	
8	Cilantro	

Recipe #2		
Ingredients	**Common: *kala* soup**	**Modified: *kala* soup with vegetables**
1	*Achiote*	*Achiote*
2	Onion	Onion
3	Garlic	Garlic
4	Chili	Chili
5	Salt	Salt
6	*Kala*	*Kala*
7		Potato
8		*Güisquil*
9		Tomato

Recipe #3		
Ingredients	**Common: chicken in rice**	**Modified: chicken soup**
1	Chicken	Chicken
2	*Hierbabuena*	*Hierbabuena*
3	Cilantro	Cilantro
4	*Zamat*	*Zamat*
5	Chili	Chili
6	Garlic	Garlic
7	Salt	Salt
8	*Güisquil*	*Güisquil*
9	Onion	Onion
10	Tomato	Tomato
11	Broth	Potato/yucca
12		Rice

Recipe #4	
Ingredients	**Modified: egg in tomato**
1	Egg
2	Tomato
3	Onion
4	Cilantro
5	Oil
6	Tortilla

Recipe #5	
Ingredients	**Common: tortilla with salt**
1	Salt
2	Tortilla

[14] The highlighted recipe columns represent the final recipes chosen for preparation.

Panzós: Recipes for children 6–11 months of age

Recipe #1		
Ingredients	**Common: beans with chili**	**Modified: beans with rice**
1	Beans	Beans
2	Salt	Salt
3	Onion	Onion
4	Cilantro	Cilantro
5	Garlic	Garlic
6	Chili	Chili
7	Rice	Rice
8		Oil
9		Tomato

Recipe #2		
Ingredients	**Common: *macuy* with green chili**	**Modified: *macuy* with green chili*** [15]
1	*Macuy*	*Macuy*
2	Salt	Salt
3	Green chili	Green chili
4		Tomato
5		Onion
6		Garlic

Recipe #3		
Ingredients	**Common: yucca soup with dried chili**	**Modified: yucca soup with dried chili***
1	Yucca	Yucca
2	Salt	Salt
3	Dried chili	Dried chili
4	Garlic	Garlic
5	*Achiote*	*Achiote*
6	*Zamat*	*Zamat*
7	Cilantro	Cilantro
8	Onion	Onion
9	Tomato	Tomato
10	Chicken flavoring	
11	Broth	

Recipe #4	
Ingredients	**Common: tortilla soup**
1	Broth
2	Tortilla
3	Coffee
4	Garlic
5	Onion
6	Tomato
7	Salt

Recipe #5	
Ingredients	**Modified: chicken**
1	Chicken
2	Tortilla
3	Corn water
4	Garlic
5	Onion
6	Tomato
7	Salt
8	*Zamat*

[15] All modified recipes marked with an asterisk (*) are recipes for which recipe trial participants did not suggest a new name.

Cobán: Recipes for children 6–11 months of age

Recipe #1		
Ingredients	**Common: tortilla with potatoes**	**Modified: tortilla with potatoes***
1	Potatoes	Potatoes
2	Tortilla	Tortilla
3	Tomato	Tomato
4	Onion	Onion
5	Cilantro	Cilantro
6		*Güisquil* point

Recipe #2		
Ingredients	**Common: *macuy* soup**	**Modified: *macuy* soup***
1	*Macuy*	*Macuy*
2	Tortilla	Tortilla
3		Turkey egg
4		Tomato
5		Carrot

Recipe #3		
Ingredients	**Common: chicken soup**	**Modified: chicken soup***
1	Chicken	Chicken
2	Onion	Onion
3	Tomato	Tomato
4	Cilantro	Cilantro
5	Garlic	Garlic
6		*Güisquil*
7		Yucca
8		Potatoes

Recipe #4	
Ingredients	**Final recipe: chicken soup with organ meats**
1	Chicken
2	Tomato
3	Onion
4	Garlic
5	*Achiote*
6	Cilantro
7	*Zamat*
8	*Güisquil*
9	Carrot
10	Potatoes
11	Salt
12	Water

Carchá: Recipes for children 6–11 months of age

Recipe #1		
Ingredients	**Common: bean soup**	**Modified: bean soup***
1	Bean broth	Bean
2	Salt	Salt
3	Water	Rice
4	Onion	Oil
5	Tortilla	Carrot
6		Cilantro
7		Peas

Recipe #2	
Ingredients	**Common: tortilla with coffee**
1	Tortilla
2	½ cup of coffee
3	Sugar

Recipe #3	
Ingredients	**Common: instant soup**
1	Broth
2	Tortilla
3	Hot water
4	Salt

Recipe #4	
Ingredients	**Common: soup with egg**
1	Broth
2	Chives
3	*Hierbabuena*
4	Egg
5	Onion
6	Salt
7	Tomato
8	Water
9	*Zamat*
10	Tortilla

Recipe #5	
Ingredients	**Modified: *güisquil* soup**
1	*Güisquil* point
2	Carrot
3	Potato
4	Onion
5	Garlic
6	Protein
7	Tomato
8	*Achiote*
9	Salt

Recipe #6	
Ingredients	**Modified: liver stew**
1	Liver
2	Tomato
3	Onion
4	Chives
5	*Hierbabuena*
6	*Malanga*
7	*Güisquil*
8	Potato
9	Garlic
10	Oil
11	*Achiote*
12	Cilantro
13	Salt

Senahú: Recipes for children 6–11 months of age

Recipe #1		
Ingredients	**Common: *macuy***	**Modified: *macuy****
1	*Macuy*	*Macuy*
2	Onion	Onion
3	Tomato	Tomato
4	Salt	Salt
5	Egg	Egg
6	Chili	Chili
7	Garlic	Garlic
8	Broth	*Miltomate*
9	Chicken flavoring	

Recipe #2		
Ingredients	**Common: potato**	**Modified: potato***
1	Potato	Potato
2	Oil	Oil
3	Tomato	Tomato
4	Onion	Onion
5	Salt	Chicken organ meat
6	Chicken flavoring	

Recipe #3		
Ingredients	**Common: bean Soup with Tortillas**	**Modified: bean Soup with Tortillas***
1	Beans	Beans
2	Chili	Chili
3	Salt	Salt
4	Onion	Onion
5	Cilantro	Cilantro
6	Oil	Oil
7	Tortilla	Tortilla
8		*Güisquil*

Recipe #4		
Ingredients	**Common: egg soup**	**Modified: egg soup***
1	Egg	Egg
2	*Hierbabuena*	*Hierbabuena*
3	Garlic	Garlic
4	Onion	Onion
5	Broth	*Samat*
6		*Güisquil* point
7		Tomato

Recipe #5	
Ingredients	**Final recipe: chicken stew**
1	Potato
2	Oil
3	Tomato
4	Onion
5	Chicken organ meat
6	Salt
7	*Güisquil*
8	Cilantro
9	*Samat*

Cahabón: Recipes for children 12–23 months of age

Recipe #1		
Ingredients	**Common: *kala* soup**	**Modified: *kala* soup***
1	*Kala*	*Kala*
2	Broth	Broth
3	Garlic	Garlic
4	Salt	Salt
5	*Zamat*	*Zamat*
6	Onion	Onion
7	Tomato	Tomato
8	*Achiote*	*Achiote*
9		Potato
10		Carrot
11		Cabbage
12		Chicken/beef
13		*Hierbabuena*
14		Cilantro

Recipe #2		
Ingredients	**Common: egg soup**	**Modified: egg soup***
1	Eggs	Eggs
2	Broth	Broth
3	Onion	Onion
4	*Zamat*	*Zamat*
5		Cilantro
6		*Güisquil* point
7		Salt
8		Chili

Recipe #3		
Ingredients	**Common: rice with beans**	**Modified: rice with beans***
1	Rice	Rice
2	Beans	Beans
3	Oil	Oil
4	Onion	Onion
5	Tomato	Tomato
6	Salt	Salt
7	Tortilla	Tortilla
8		Eggs

Recipe #4		
Ingredients	**Common: tortilla with chili**	**Modified: tortilla with chicken soup and chili**
1	Tortilla	Tortilla
2	Dried chili	Chili
3	Coffee	Chicken
4		Cilantro
5		*Zamat*
6		Tomato
7		Onion
8		Salt
9		Garlic
10		*Achiote*

Recipe #5	
Ingredients	**Common: *macuy* soup**
1	*Macuy*
2	Salt
3	Water

Recipe #6	
Ingredients	**Common: *Incaparina***
1	*Incaparina*
2	Water
3	Sugar
4	Cinnamon

Panzós: Recipes for children 12–23 months of age

Recipe #1		
Ingredients	**Common: bean soup**	**Modified: tossed beans**
1	Beans	Beans
2	Onion	Onion
3	Salt	Salt
4	Chili	Chili
5	Tomato	Oil

Recipe #2			
Ingredients	**Common: *macuy* soup**	**Modified: *macuy* soup**	**Final: *macuy* soup***
1	*Macuy*	*Macuy*	*Macuy*
2	Onion	Onion	Onion
3	Tomato	Tomato	Tomato
4	Green chili	Salt	Salt
5	Salt	Green chili	
6	Chicken flavoring	Oil	

Recipe #3		
Ingredients	**Common: *güisquil* point**	**Modified: *güisquil* point***
1	*Güisquil* point	*Güisquil* point
2	Garlic	Garlic
3	Onion	Onion
4	Tomato	Tomato
5	Broth	Chicken flavoring
6	*Zamat*	*Zamat*
7	Cilantro	Cilantro
8	*Achiote*	*Achiote*
9	Salt	Salt
10		Corn
11		*Güisquil*
12		Egg

Recipe #4		
Ingredients	**Common: heart of palm stew**	**Modified: heart of palm stew**
1	Heart of palm	Heart of palm
2	*Zamat*	*Zamat*
3	Tomato	Tomato
4	Onion	Onion
5	Salt	Salt
6	Chili	Chili
7	*Achiote*	*Achiote*
8	Oil	Oil
9	Chicken flavoring	Cilantro

Recipe #5		
Ingredients	**Common: *yute* boiled in sauce***	**Modified: *yute* boiled in sauce***
1	*Yute*	*Yute*
2	Salt	Salt
3	Chili	Chili
4	Tomato	Tomato
5	Onion	Onion
6	Corn	Corn
7	*Achiote*	*Achiote*
8	Santa Maria	Santa Maria
9	Cilantro	Cilantro
10	*Zamat*	*Zamat*
11	Chicken flavoring	

Cobán: Recipes for children 12–23 months of age

Recipe #1		
Ingredients	**Common: cooked cabbage**	**Modified: cabbage soup***
1	Cabbage	Cabbage
2	Onion	Onion
3	Tomato	Tomato
4	Garlic	Garlic
5	Salt	Salt
6	*Hierbabuena*	Organ meat
7		Carrot
8		*Zamat*
		Achiote

Recipe #2		
Ingredients	**Common: noodle soup**	**Modified: noodle soup***
1	1 bag of noodles	Chicken
2	Onion	Onion
3	Garlic	Garlic
4	Tomato	Tomato
5	*Zamat*	*Zamat*
6	Cilantro	Cilantro
7		Tortilla

Recipe #3		
Ingredients	**Common: beans and tortilla**	**Modified: tossed beans**
1	Beans	Tossed beans
2	Tortilla	Tortilla
3		Onion
4		Rice
5		Oil

Carchá: Recipes for children 12–23 months of age

Recipe #1		
Ingredients	**Common: beans with tortilla**	**Modified: beans with tortilla***
1	Beans	Beans
2	Onion	Onion
3	Salt	Salt
4		Hard-boiled egg
5		Rice
6		*Macuy*
7		Cilantro

Recipe #2			
Ingredients:	**Common: potatoes boiled in sauce**	**Modified: potatoes boiled in sauce**	**Final: potatoes boiled in sauce***
1	Potato	Potato	Potato
2	*Zamat*	*Zamat*	*Zamat*
3	Chicken flavoring	Chicken flavoring	Chili pepper
4	Tomato	Tomato	Tomato
5	Onion	Onion	Onion
6	Salt	Salt	Salt
7		*Ejote*	Carrot
8		Organ meat	Organ meat
9		Cilantro	Cilantro
10		*Achiote*	*Achiote*
11		Corn	Corn
			Güisquil

Recipe #3		
Ingredients	**Common: noodles**	**Modified: noodles***
1	1 pound of noodles	Noodles
2	Tomatoes	Tomato
3	Onion	Onion
4	Chicken flavoring	Chicken flavoring
5	Oil	Oil
6		Cilantro
7		*Güisquil* point
8		Potato
9		Carrot
10		Water

Recipe #4		
Ingredients	**Common: *güisquil* point**	**Modified: *güisquil* point***
1	*Güisquil* point	*Güisquil* point
2	Tomato	*Güisquil*
3	Small onion	Small onion
4	Chicken flavoring	Chicken flavoring
5	Chili pepper	Garlic
6	Garlic	*Zamat*
7		Eggs
8		

Senahú: Recipes for children 12–23 months of age

Recipe #1		
Ingredients	**Common: *güisquil* point soup**	**Modified: *güisquil* point soup***
1	*Güisquil* point	*Güisquil* point
2	Garlic	Garlic
3	Salt	Salt
4	*Samat*	*Samat*
5	Tortilla	Tortilla
6	Broth	Egg from Creole Chicken

Recipe #2		
Ingredients	**Common: scrambled eggs**	**Modified: eggs scrambled with tomato and onion**
1	Egg	Egg
2	Oil	Oil
3	Salt	Salt
4	Tortilla	Tortilla
5		Tomato
6		Onion
7		Cilantro

Recipe #3		
Ingredients	**Common: fried rice**	**Modified: fried rice***
1	Rice	Rice
2	Tomato	Tomato
3	Salt	Salt
4	Chicken flavoring	Chicken flavoring
5		Carrot
6		Peas
7		Potato

Recipe #4		
Ingredients	**Common: noodle soup**	**Modified: noodle soup***
1	Noodles	Noodles
2	*Samat*	*Samat*
3	Cilantro	Cilantro
4	*Achiote*	*Achiote*
5	Tortilla	Tortilla
6	Chicken flavoring	Tomato
7		Oregano
8		Chives
9		Onion

Recipe #5		
Ingredients	**Common: bean soup**	**Modified: bean soup with rice**
1	Beans	Beans
2	Cilantro	Cilantro
3	Salt	Salt
4	Tortilla	Tortilla
5		Rice
6		Oil
7		Onion
8		Tomato

Recipe #6		
Ingredients	**Common: potato stew**	**Modified: potato stew***
1	Potatoes	Potatoes
2	Tomato	Tomato
3	Onion	Onion
4	Oil	Oil
5	Salt	Salt
6	Tortilla	Tortilla
7		*Hierbabuena*
8		Cilantro
9		*Zamat*

Appendix 3. Recipes for complementary foods for children 6–11 months of age and children 12–23 months of age prepared with CSB

Puree of egg yolk and CSB (CHICHAIC)	
Ingredients	
1	Eggs
2	CSB
3	Oil
4	Salt

Bean relish (ICHAB)	
Ingredients	
1	Beans
2	CSB
3	Oil
4	Water
5	Salt

CSB, egg, and vegetable pancakes (RAXAHA)	
Ingredients	
1	Point of *güisquil*
2	Eggs
3	Tomato
4	Onion
5	Garlic
6	Salt
7	CSB
8	Water
9	Oil

Bean relish with CSB (SACANILLA)	
Ingredients	
1	Beans
2	Onion
3	Tomato
4	Garlic
5	Oil
6	CSB
7	*Achiote*
8	Water
9	Salt

Liver tarts with CSB (CHICOJL)	
Ingredients	
1	Liver
2	Tomato
3	Onion
4	Potato
5	Salt
6	Mint
7	Carrots
8	Oil
9	Garlic
10	CSB
11	Eggs

Appendix 4. Ranking of practices to promote through Mercy Corps SBCC strategy[a]

Scoring for each of the recommended practices for each of the criteria is as follows.

Impact:
0. Would not have an impact on the problem
1. Would have some impact on the problem
2. Would eliminate the problem

Positive consequences:
0. None
1. Very few or some
2. Has many or significant positive consequences

Compatibility with beliefs and knowledge:
0. The mothers' beliefs are incompatible with recommended practices
1. The mothers' beliefs are somewhat compatible with the recommended practices
2. The mothers' beliefs are compatible with the recommended practices

Cost (resources or money):
0. Requires significant additional resources
1. Requires few additional resources
2. Requires no additional resources or requires resources that are already available to the mother

Cost (time or effort):
0. Requires significant time or effort, it is not realistic
1. Requires some time or effort
2. Requires very little time or effort

Complexity:
0. Too complex, it requires too many steps (five or more)
1. Requires several steps (three or more)
2. Requires a few steps (one or two); Feasibility is the sum of the scores for criteria 2−6;

Observability:
0. Cannot be observed
1. Can be observed, although it would be somewhat difficult to observe
2. Can be easily observed; Total is the sum of the scores for criteria 1−7

Recommended practices	Impact (1)	Positive consequences (2)	Compatibility with beliefs and knowledge (3)	Cost (resources or money) (4)	Cost (time or effort) (5)	Complexity (6)	Feasibility (2–6)	Observablity (7)	Total (1–7)
Eat more food and a greater variety of foods during pregnancy.	1	2	2	1	1	2	8	1	10
For pregnant and lactating women: Use fortified foods, including such things as *Incaparina* and CSB.	2	2	2	1	1	1	7	1	10
Mothers should eat better during pregnancy and lactation.	2	2	1	1	1	1	6	1	9
Help the lactating mother take care of her breasts.	1	1	2	2	1	1	7	1	9
Give colostrum.	2	2	2	2	2	2	10	2	14
Give breast milk immediately (within the first hour after birth).	2	2	2	2	2	2	10	0	12
Exclusive breastfeeding until 6 months of age.	2	2	2	2	2	2	10	1	13
Breast milk quenches thirst.	2	2	1	2	2	2	9	1	12
Breastfeed even when you are pregnant.	2	2	1	2	2	2	9	1	12
Do not use bottles; use cups or spoons.	1.5	2	1	2	1	1.5	7.5	2	11
Eat a variety of foods.	2	2	2	1	1	1	7	1	10
Know good foods to eat.	1	2	2	2	1	1	8	1	10
Use good foods.	1	2	2	0	1	0	5	1	7
Give children 6 months and older meat, such as organ meats and chicken.	2	2	0	1	1	1	5	1	8
Eat ASF (e.g., eggs).	1	2	2	0	2	2	8	1	10
Know the number of times to feed children (frequency of feeding).	1	2	1	1	1	2	7	1	9
Feed boy and girl children in the same way.	1	1	0	0	2	1	4	0	5
Do not drink coffee (children).	1	1	1	2	2	2	8	1	10
Do not drink coffee (children under 2 years of age).	2	2	0	2	2	0	6	1	9
Do not drink sodas, broths, or other sweet drinks.	1	2	1	2	2	2	9	2	12
Reinforce safe preparation of foods.	1	2	2	1	1	1	7	1	9
Reinforce safe preparation of foods for women and children 6 months and older.	1	2	2	1	1	1	7	1	9
Wash hands.	1	2	2	2	1	2	9	1	11
Wash foods.	1	2	2	2	2	2	10	1	12
Do not eat with your hands or give children	2	2	0	2	2	2	8	2	12

Recommended practices	Impact (1)	Positive consequences (2)	Compatibility with beliefs and knowledge (3)	Cost (resources or money) (4)	Cost (time or effort) (5)	Complexity (6)	Feasibility (2–6)	Observablity (7)	Total (1–7)
food directly from your hands.									
Reinforce good hygiene practices: wash hands, bathe children, use latrines, dispose of waste properly.	1	2	2	0	1	0	5	2	8
Attend prenatal controls (once per month).	1	2	2	1	1	1	7	1	9
Know the danger signs during pregnancy.	1	2	2	2	1	1	8	2	11
Give mothers the proper vaccinations.	1	2	2	2	2	2	10	2	13
Take the recommended MN supplements during pregnancy.	1	2	2	1	1	2	8	2	11
Have a birth plan.	1	2	2	2	1	2	9	1	11
Know the danger signs during birth.	1	2	2	2	1	1	8	2	11
Go to a health center when there are complications during birth.	1	2	2	1	1	2	8	2	11
Know the postpartum danger signs.	1	2	2	2	1	1	8	2	11
Take the recommended MN supplements during lactation.	1	2	2	1	1	2	8	2	11
Know the danger signs for a newborn.	1	2	2	2	1	1	8	1	10
Get proper vaccinations for children.	1	2	2	2	1	2	9	2	12
Use ORS.	1	2	2	2	1	2	9	2	12
Know the danger signs of childhood illness.	2	2	1	2	1	1	7	1	10
Receive postnatal care.	2	2	1	1	1	1	6	2	10
Give children the recommended MN supplements.	1	2	2	1	1	1	7	2	10
Deworm.	1	2	2	1	1	1	7	1	9
Have a community emergency fund for high risk deliveries.	0	2	1	0	1	0	4	2	6
Do not become pregnant to participate in the program.	2	2	1	2	2	1	8	2	12

[a] Shaded cells highlight topics that Mercy Corps identified as being priority topics to include in the SBCC strategy.