

2<sup>nd</sup> Edition

# *ProPAN*

Process for the Promotion of Child Feeding



**Pan American  
Health  
Organization**

Regional Office of the  
World Health Organization

unicef 

**Field Manual**



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### Field Manual



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Health  
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World Health Organization

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Pan American Health Organization. United Nations Children's Fund.

*ProPAN: Process for the Promotion of Child Feeding*. 2. ed. Washington, D.C. : PAHO, 2013.

1. Infant Nutrition. 2. Child Welfare. 3. Child Care. 4. Nutrition Programmes and Policies. 5. Health Promotion. I. Title. II. UNICEF

ISBN 978-92-75-11728-6

(NLM Classification: WS 130)

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# Introduction . . .

## Purpose

**ProPAN** is a set of research tools designed for ministries of health (MoHs), nongovernmental organizations (NGOs), and bilateral and international organizations working to improve the diets and feeding practices of children under 24 months old to prevent early childhood malnutrition. **ProPAN** guides users through a step-by-step process for identifying problems related to young child nutrition, breastfeeding, and complementary feeding within a specific target population; defining the context in which these problems occur, including barriers to and facilitators of improved or “ideal” practices; formulating, testing, and selecting behavior-change recommendations and nutritional recipes; developing the interventions to promote them; and designing a monitoring and evaluation system to measure progress toward intervention goals. **ProPAN** materials include a multi-module field manual with detailed instructions on how to collect, analyze, and integrate the quantitative and qualitative data required to design and evaluate interventions, and an Epi Info™-based software program developed specifically for quantitative analysis of household demographic and socio-economic characteristics and infant and young child diets, and as an analytical tool for identifying locally available foods that provide the greatest amount of energy and nutrients at the lowest cost<sup>1</sup>.

## Structure and Content

The **ProPAN** field manual comprises four modules: Assessment (Module I); Testing recommendations and recipes (Module II); Developing the intervention plan (Module III); and Designing a monitoring and evaluation system (Module IV). Each module has two components: 1) an overview of the module’s purpose, products, and steps, and the concepts and techniques that will be applied in the research, and 2) an annex containing custom-designed tools for analysis of dietary and feeding problems and instructions on how to apply them.

**ProPAN** tools include:

- Forms and guides for collection of quantitative and qualitative data. Quantitative methods include a Caregiver’s Survey, 24-hour Dietary Recall and Anthropometry, and Market Survey and qualitative methods include Opportunistic Observations, Semi-structured Interviews, and Focus Groups
- Methods for integrating quantitative and qualitative data
- Methods for formulating, ranking, and selecting dietary and feeding practice recommendations, based on practicality, feasibility, and acceptability

<sup>1</sup> Epi Info™ is a public domain software package designed and developed for public health practitioners and researchers worldwide by the U.S. Centers for Disease Control and Prevention (CDC) and WHO.

- Software for standardized input and output of nutrition, feeding, and diet information, including outputs for use in the World Health Organization (WHO) *Optifood* software program<sup>2</sup>
- Guidance on how to convert the resulting data into an intervention or program and to design a monitoring and evaluation strategy.

**ProPAN** criteria for analysis of diet, and feeding practices are based on the PAHO/WHO Guiding principles for complementary feeding of the breastfed child (PAHO/WHO, 2003) and the WHO Principles for feeding non-breastfed children 6-24 months of age (WHO, 2005), the WHO/UNICEF Indicators for assessing infant and young child feeding practices (WHO and partners, 2008), and other WHO criteria for breastfeeding and complementary feeding of infants and young children (Dewey and Brown, 2003, WHO, 1998). Assessment of weight-for-age, length-for-age, weight for length is based on the WHO Child Growth Standards (WHO, 2006) and Mid Upper Arm Circumference (MUAC) is based on the WHO recommendation (WHO and UNICEF, 2009). **ProPAN** methodologies can be used to develop interventions to improve both breastfeeding and complementary feeding but places a relative emphasis on complementary feeding because less is known about how to most effectively improve these practices.

In addition to the content described above, **ProPAN** includes the following tools and supplemental information:

- A Logistics section explaining the resources required to carry out the various **ProPAN** components and the estimated budget, staffing and time frame required
- A website with links to the **ProPAN** software program and supplemental materials (videos and research reports about experiences using **ProPAN**) [www.PAHO.org/ProPAN](http://www.PAHO.org/ProPAN)

The **ProPAN** software program, which is compatible with Epi Info<sup>™3</sup> version 3.5.4 and higher (excluding version 7), allows for easy questionnaire and database construction, data entry, and standardized output of diet and feeding practices. The data analysis tools can help identify key nutrient gaps, and determine the relative nutritional importance and cost of local foods available to fill them. They can also be used to analyze the anthropometric data collected in Module I, and the energy and nutrient profile of recipes created in Module II, and to determine the frequency of consumption of certain foods—one of the required inputs for the WHO *Optifood* program. A **ProPAN** Software User's Guide is available to facilitate use of the software.

As shown in Figure 1, the main products (outcomes) of **ProPAN**, by module, are as follows:

- **Module I. Assessment** guides users in applying quantitative and qualitative research methods to identify diet and feeding problems, the practices that lead to them, and the context in which they occur. This module provides an assessment algorithm for evaluating responsive feeding, based on research conducted in Peru (Creed-Kanashiro et al., 2010) as well as questions on infant feeding within the context of HIV/AIDS. The main product is the identification of problematic diet and feeding practices and the generation of a list of recommendations that could be promoted to improve them.
- **Module II. Testing recommendations and recipes** helps users test the acceptability and feasibility of

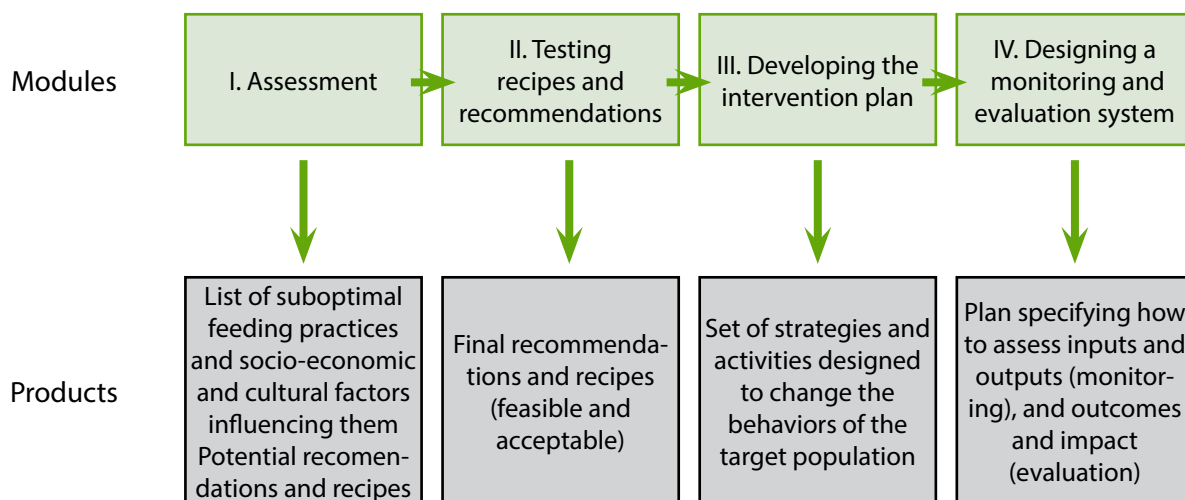
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<sup>2</sup> A software program developed by WHO and its partners as a research tool for 1) formulating and testing food-based recommendations, 2) selecting the lowest-cost nutritionally optimal diet for a target population, and 3) identifying nutrient requirements that may be difficult to meet through diets based on locally available foods.

the potential recommendations identified in Module I, using behavior and recipe testing. The main products of Module II are final recommendations based on practicality, feasibility, and acceptability by the community—that is, practices that caregivers, family members or health workers can and are willing to adopt, and foods and recipes that family members are willing to prepare and feed to young children.

- **Module III.** *Developing the intervention plan* helps users devise an intervention plan based on the final recommendations selected and tested in Module II. The main product of this module is the selection of optimal strategies, activities, materials, and messages for promoting the desired changes in diet and feeding practices.
- **Module IV.** *Designing a monitoring and evaluation system* helps users 1) design appropriate indicators to monitor the intervention implementation process, and impact, and 2) select an appropriate evaluation design. The main product of this module is the design of a system for monitoring and evaluating the intervention.

**Figure 1. Structure and products of ProPAN modules**



## Applications

Although **ProPAN** is designed for use as one comprehensive unit—from the assessment of general nutrition situation through monitoring and evaluation of the intervention—it can also be applied “cafeteria style,” with users selecting and applying only the modules or parts of modules relevant to their programming needs. For those wishing to design a new program on infant and young child feeding, use of all of the modules is recommended. **ProPAN** can be used to build on existing programs (e.g., develop key program messages, identify optimal recipes for community demonstrations, or determine facilitators of and/or barriers to the adoption of improved practices). Users seeking to adapt, expand, or improve an existing program may only want to apply selected modules or components relevant to a specific purpose (e.g., Module II, for testing the feasibility and acceptability of new recommended practices or recipes, or Module IV, for designing a monitoring and evaluation system). Although **ProPAN** is primarily designed for developing interventions directed at caregivers, it can also be used for alternate applications, such as incorporating infant feeding counseling into health providers’ routine care, or training nutrition researchers in quantitative and qualitative methods.

The **ProPAN** toolset provides guidance on optimal delivery of interventions developed with the use of **ProPAN** materials through delivery platforms such as existing programs or other structures or entities (e.g. primary health care or community-based services). It also helps identify how **ProPAN** methodologies might be incorporated into health service protocols such as those included in the Integrated Management of Childhood Illness (IMCI) strategy.

While **ProPAN** materials focus mainly on undernutrition, they can also be applied to address problems of overweight. For example, the 24-hour Dietary Recall and Anthropometry questionnaire can be used to identify populations where energy intake is above recommendations and weight-for-height is above two standard deviations of the WHO Child Growth Standard. Other tools in **ProPAN** can be used to explore the reasons for these problems and to identify and test potential recommendations to correct them.

**ProPAN** is extremely comprehensive and adaptable and thus can be used in a variety of settings. To date, **ProPAN** has been used in over 15 countries in Africa, Asia, and Latin America. Lessons learned from these experiences have been incorporated into the current, updated version of **ProPAN**, including the Food Composition Table found in the **ProPAN** software package, which can be updated with new foods as needed.

## Background

**ProPAN** was guided by the recognition that undernutrition is most common and severe during the intrauterine period and first 2 years of life, and adverse effects during this period on child survival and development are of great concern (Black et al., 2008). Women in poor areas of the world often enter pregnancy in a state of compromised nutrition, which frequently worsens when the additional demands of pregnancy are not met. As a result, intrauterine growth retardation is all too common. Infants and young children have high nutritional requirements, are highly susceptible to infections, and require nutrient-dense diets and special feeding practices (WHO, 1998). Unfortunately, many families do not have access to an adequate quantity and quality of food, basic sanitation, and health care. In many situations, these

inadequacies are exacerbated by poor feeding and care practices. As a result, a large proportion of infants and young children suffer from growth failure and deficiencies in micronutrients such as iron, vitamin A, and zinc (Black et al., 2008). The consequences of undernutrition at formative stages of life place a great burden on affected individuals as well as society as a whole (Victora et al., 2008). During preschool years, these include poor resistance to infection, significant morbidity and mortality, and delayed mental and motor development. In the long term, consequences include deficient learning at school, impaired intellectual performance, small body size, greater risk of chronic disease onset in adulthood, reduced work capacity in adults, and in girls/women, increased risk of delivery complications, and low-birth-weight newborns (Victora et al., 2008).

Recognition of the importance of adequate nutrition in early life stages has led to the reorientation of many programs to focus on the first 1 000 days of life, a period that includes women during pregnancy and infants and young children through the age of 24 months (Clinton, 2011). Evidence links exclusive breastfeeding with significantly reduced incidence of diarrheal disease, respiratory infections, and mortality (Black et al., 2008, WHO Collaborative Study Team, 2000), and improved dietary intake in infants and young children with significantly better growth (Adu-Afarwuah et al., 2008, Guldan et al., 2000, Penny et al., 2005, Dewey and Adu-Afarwuah, 2008).

Therefore the use of improved (or “ideal”) breastfeeding and complementary feeding practices is a direct and effective strategy for preventing child malnutrition. Ideal practices for infant feeding include exclusive breastfeeding for 6 months followed by timely, adequate, safe, and properly fed complementary foods together with continued breastfeeding for 2 years or beyond (WHO, 2003).

Based on the *Guiding principles for complementary feeding of the breastfed child* (PAHO/WHO, 2003) and the *Guiding principles for feeding non-breastfed children 6–24 months old* (WHO, 2005) a list of 12 ideal breastfeeding and complementary feeding practices was defined. This list is used to guide analysis of quantitative and qualitative diet and feeding data (Table 1). Some of the operational definitions of these practices were developed specifically for use in **ProPAN**. For example, the questions and algorithm for defining responsive feeding is summarized in Table 1 under Ideal Practice 11. The updated definitions of these ideal practices benefited from the three-part series on indicators for assessing infant and young child feeding practices recently developed by WHO and its partners (WHO, WHO and partners, 2008, WHO and partners, 2010, WHO and partners, 2010).

The scientific framework for and basis for the analysis of the ideal practices stems from key earlier publications from WHO and others (Dewey and Brown, 2003, WHO, 1998), which provide recommendations for daily nutrient and energy intakes and nutrient and energy densities for complementary foods (Tables 2, 3 and 4).

## Target population for behavior change

To improve child nutrition, the ultimate target population for behavior change related to young child dietary and feeding practices is the caregiver. Within the context of **ProPAN**, the term “caregiver” refers to the person or persons who feed and care for the infant or young child most of the time and/or make decisions on how and what he/she should be fed. While the caregiver is usually the mother, it may

also be the grandmother or another relative. Other individuals may serve as gatekeepers, facilitating or hindering caregivers' willingness and ability to adopt improved practices. These include other family members, health workers, religious figures, midwives, shamans, and other influential people within and outside of the child's family. In order to achieve the desired changes in infant and young child feeding practices, program planners need to think strategically about how to best leverage the contributions of these different gatekeepers. The information generated by **ProPAN** can be used to simultaneously target multiple gatekeepers as well as the primary caregiver, increasing the likelihood that the intervention will be effective.

**Table 1. Ideal practices for infant and young child breastfeeding and complementary feeding by indicator**

Ideal Practice	Indicator	Source	Calculation (numerator/denominator x 100)
1. All infants breastfed for first time within 1 hour of birth	Percentage of children 0–23.9 months breastfed for first time within 1 hour of birth	Caregiver Survey Q33: How many hours after birth was [child's name] breastfed for the first time?	Numerator: children 0–23.9 months whose caregivers reported breastfeeding infant for first time within 1 hour of birth Denominator: all children 0–23.9 months whose caregivers were interviewed
2. All infants not fed anything other than breast milk during first 3 days of life	Percentage of children 0–23.9 months not fed anything other than breast milk during first 3 days of life	Caregiver Survey Q35: During the first 3 days after birth, was [child's name] given anything other than breast milk?	Numerator: children 0–23.9 months whose caregivers reported not feeding them anything other than breast milk during first 3 days of life Denominator: all children 0–23.9 months whose caregivers were interviewed
3. All infants fed colostrum	Percentage of children 0–23.9 months old fed colostrum.	Caregiver Survey Q34: Was [child's name] fed colostrum ("first milk")?	Numerator: children 0–23.9 months whose caregivers reported feeding them colostrum Denominator: all children 0–23.9 months whose caregivers were interviewed
4. All infants and young children breastfed on demand, day and night	Percentage of children 0–23.9 months breastfed on demand	Caregiver Survey Q40: Yesterday, was [child's name] breastfed whenever he/she wanted, or on a fixed schedule? Note: If the response is "whenever [child's name] wanted," classify answer as "breastfed on demand"	Numerator: children 0–23.9 months whose caregivers reported breastfeeding them "whenever [the child] wanted" Denominator: all children 0–23.9 months who were breastfeeding at the time of the survey and whose caregivers were interviewed
5. All infants less than 6.0 months exclusively breastfed	Percentage of children 0–5.9 months who consumed breast milk but no water, other liquids, or foods the previous day	Caregiver Survey Q38: Yesterday, was [child's name] breastfed? Q54: Yesterday, what liquids other than breast milk was [child's name] given? Q56: Yesterday, did [child's name] eat any solid or semi-solid foods? Note: If the response is "currently breastfeeding" and the infant consumed no water, other liquids, or solid or semi-solid foods, classify answer as "exclusively breastfed"	Numerator: infants 0–5.9 months who were breastfed and did not receive any water, other liquids, or foods the previous day Denominator: all infants 0–5.9 months whose caregivers were interviewed
6. All children breastfed through the age of 2 years old or older	Percentage of children 20.0–23.9 months breastfed the previous day	Caregiver Survey Q38: Yesterday, was [child's name] breastfed? Note: If the response is "Yes," classify answer as "breastfed previous day"	Numerator: children 20.0–23.9 months whose caregivers reported breastfeeding the previous day Denominator: all children 20.0–23.9 months whose caregivers were interviewed

Ideal Practice	Indicator	Source	Calculation (numerator/ denominator x 100)
7. All infants fed semi-solid complementary foods at the age of 6.0 months (180 days)	Percentage of children 9.0–23.9 months who began complementary feeding with solid foods or semi-solid foods between 6.0 and 8.9 months	<i>Caregiver Survey</i> <i>Q52. At what age was [child's name] fed his/her first solid/semi-solid food?</i> <i>Note: If the response is "between 6.0 and 8.9 months," classify answer as "complementary feeding initiated at 6 months with semi-solid foods"</i>	Numerator: children 9.0–23.9 months whose caregivers reported initiating complementary feeding between 6.0 and 8.9 months old with semi-solid foods  Denominator: all children 9.0–23.9 months whose caregivers were interviewed
8. All infants and young children aged 6.0–23.9 months meet recommended daily energy and nutrient <sup>a</sup> requirements	Percentage of children 6.0–23.9 months who, in the previous 24 hours, consumed the daily energy requirement, based on age and breastfeeding status  <i>Note: At least 50% of children must meet their energy requirement to consider this ideal practice satisfied<sup>b,c</sup></i>	<i>24-hour Dietary Recall and Anthropometry</i> <i>Note: Energy intake is calculated from kcal content of non-breast milk foods and liquids consumed; average energy content of breast milk is added to the calculation when child is breastfed.</i>	Numerator: children 6.0–23.9 months whose energy intake met or surpassed energy requirement  Denominator: all children 6.0–23.9 months whose caregivers were interviewed
9. All infants and young children aged 6.0–23.9 months fed nutrient- and energy-dense foods	Percentage of children 6.0–23.9 months whose mean energy and nutrient intake from all non-breast milk foods and liquids consumed in previous 24 hours met or surpassed the recommended energy and nutrient densities for protein, iron, zinc, vitamin A, vitamin C, and calcium, based on age and breastfeeding status	<i>24-hour Dietary Recall and Anthropometry</i> <i>Note: Percent nutrient density is calculated by summing nutrient intake from all non-breast milk foods and liquids consumed, expressing total foods and liquids consumed per 100 kcal (with average nutrient content of breast milk added to calculation when child is breastfed), and comparing it to recommended nutrient density (based on child's age and breastfeeding status).</i>  <i>Percent energy density is calculated by summing energy intake from all non-breast milk foods and liquids, expressing it per 1 g of foods and liquids consumed (with average energy content of breast milk added to calculation when child is breastfed), and comparing it to recommended energy density (based on child's age and breastfeeding status).</i>  <i>Classify answer as "consumed recommended energy and nutrient densities" if all of the following seven criteria are met: 1) "% energy density recommendations met" ≥ 50%, 2) "% protein density recommendations met" ≥ 100%, 3) "% iron density recommendations met" ≥ 100%, 4) "% zinc density recommendations met" ≥ 100%, 5) "% vitamin A density recommendations met" ≥ 100%, 6) "% vitamin C density recommendations met" ≥ 100%, and 7) "% calcium density recommendations met" ≥ 100%</i>	Numerator: children 6.0–23.9 months who consumed 50% or more <sup>c</sup> of the energy density requirements and 100% or more of the nutrient density requirements for 6 nutrients (protein, iron, zinc, vitamin A, vitamin C, and calcium) (calculated separately)  Denominator: all children 6.0–23.9 months whose caregivers were interviewed
10. All infants and young children 6.0–23.9 months fed recommended number of meals daily	Percentage of children 6.0–23.9 months who in previous 24 hours consumed the following minimum number of meals: breastfed children, 6.0–8.9 months: 2; breastfed children, 9.0–23.9 months: 3; non-breastfed children, 6.0–23.9 months: 4 <sup>d</sup>	<i>24-hour Dietary Recall and Anthropometry</i> <i>Note: All caregiver-defined meal times, including main meals and snack times, are summed for the child and compared to age- and breastfeeding-specific recommendations.</i>	Numerator: children 6.0–23.9 months whose feeding frequency met or surpassed minimum frequency recommendation  Denominator: all children 6.0–23.9 months whose caregivers were interviewed

Ideal Practice	Indicator	Source	Calculation (numerator/denominator x 100)
11. All infants and young children 6.0–23.9 months fed by caregiver responsive to child	Percentage of children 6.0–23.9 months whose caregiver reported responsive feeding behavior during meal times	<p><i>Caregiver Survey</i></p> <p>Q61. Yesterday, during the main meal, did you do anything to encourage [child's name] to eat?</p> <p>Q62. What did you do?</p> <p>Q63. Yesterday, during the main meal, while feeding [child's name], did you talk to him/her?</p> <p>Q64. What did you say?</p> <p>Q65. Yesterday, during the main meal, did [child's name] self-feed (eat by him/herself, using hands or utensil) at any time during the meal?</p> <p>Q66. Yesterday, during the main meal, did [child's name] self-feed the whole time, half the time, or for a little time?</p> <p><i>Note: The four responsive feeding measures are: 1) encouraging the child to eat, 2) talking to the child during the meal, 3) providing him/her with the opportunity to self-feed, and 4) not giving an inappropriate response to the child for refusing to eat. These measures are scored as follows: +1 point for self-feed; +1 point for talking to child during meal (without ordering or threatening him/her to eat); +1 point for encouraging child to eat if caregiver feels he/she has not eaten enough; and –1 point for an inappropriate response to a child's refusal to eat. Appropriate answers differ by age).</i></p> <p><i>Code answer as "responsibly fed" if total score ≥ 2.</i></p>	<p>Numerator: children 6.0–23.9 months whose caregivers reported engaging in two or more of the four responsive feeding measures (see Column C, below, for definition)</p> <p>Denominator: all children 6.0–23.9 months whose caregivers were interviewed</p>
12. All infants and young children 6.0–23.9 months fed as recommended during and after illness	Percentage of children 6.0–23.9 months who were fed as recommended during and after illness	<p><i>Caregiver Survey</i></p> <p>Q67: The last time [child's name] was sick, did you offer less, more, or the same amount of breast milk as you do when he/she is healthy?</p> <p>Q68: The last time [child's name] was sick, did you offer less, more, or the same amount of non–breast milk liquids as you do when he/she is healthy?</p> <p>Q69: The last time [child's name] was sick, did you offer less, more, or the same amount of food as when he/she is healthy?</p> <p>Q70: After the illness ended, did you offer less, more, or the same amount of food as when he/she is healthy?</p>	<p>Numerator: children 6.0–23.9 months whose caregivers reported feeding the same or more during and after illness</p> <p>Denominator: all children 6.0–23.9 months whose caregivers were interviewed</p>

a Nutrient intake is measured for iron, vitamin A, vitamin C, zinc, and calcium.

b Unlike nutrient recommendations, which are set at two standard deviations above the average requirement, to ensure the needs of virtually all of the population are met, energy recommendations are set at the median, to discourage excess intake. Therefore, if 50% of the population meets or exceeds this requirement, energy intake is considered adequate.

c This indicator will not identify children whose energy intakes are excessive and thus may lead to overweight or obesity.

d WHO and UNICEF recommend children be breastfed until they are 2 years old or older. However, because some children in this age range are not breastfed, ProPAN's software takes into consideration breastfeeding status in assessing this ideal practice.

**Table 2. Recommended daily nutrient intake and complementary food nutrient density for infants and young children, by age group and breastfeeding status**

Nutrient	Age group (months)	Intake		Density of complementary foods (per 100kcal) <sup>d</sup>	
		Breastfed <sup>a,b</sup>	Not breastfed <sup>c</sup>	Breastfed <sup>a</sup>	Not breastfed
Protein (g)	6.0–8.0	2.0	9.1	1.0	1.5
	9.0–11.0	3.1	9.6	1.0	1.4
	12.0–23.9	5.0	10.9	0.9	1.2
Iron (mg)					
Low bioavailability	6.0–8.9	20.8	21.0	10.3	3.4
	9.0–11.9	20.8	21.0	6.8	3.1
	12.0–23.9	11.8	12.0	2.2	1.3
Medium bioavailability	6.0–8.9	10.8	11.0	5.3	1.8
	9.0–11.9	10.8	11.0	3.5	1.6
	12.0–23.9	5.8	6.0	1.1	0.7
Zinc (mg)	6.0–8.9	4.2	5.0	2.1	0.8
	9.0–11.9	4.3	5.0	1.4	0.7
	12.0–23.9	5.8	6.5	1.1	0.7
Vitamin A (µg REe)	6.0–8.9	13.0	350.0	6.0	57.0
	9.0–11.9	42.0	350.0	14.0	51.0
	12.0–23.9	126.0	400.0	23.0	45.0
Vitamin C (mg)	6.0–8.9	0	25.0	0	4.1
	9.0–11.9	0	25.0	0	3.6
	12.0–23.9	8.0	30.0	1.5	3.4
Calcium (mg)	6.0–8.9	336.0	525.0	166.0	85.0
	9.0–11.9	353.0	525.0	115.0	77.0
	12.0–23.9	196.0	350.0	36.0	39.0

a Assuming average breast milk intake

b (WHO, 1998) (Table 26)

c (WHO, 1998) (Table 25)

d Recommended daily nutrient intake x 100 / recommended daily energy intake (Dewey and Brown, 2003a) (Table 1)

e RE: retinol equivalent

**Table 3. Recommended daily complementary food energy intake<sup>a</sup> for infants and young children,<sup>b</sup> by age group and breastfeeding status**

Age group (months)	Breastfed		Not Breastfed	
	kcal	kcal/kg <sup>c</sup>	kcal	kcal/kg <sup>c</sup>
6.0–8.9	202.0	25.3	615.0	76.9
9.0–11.9	307.0	34.5	686.0	77.1
12.0–23.9	548.0	49.8	894.0	81.3

a Amount required to maintain ideal body weight (8.0 kg, 8.9 kg, and 11.0 kg for children 6.0–8.9, 9.0–11.9, and 12.0–23.9 months, respectively)

b (Dewey and Brown, 2003a) (Tables 1 and 2)

c Recommended kcal/day / ideal body weight

**Table 4. Recommended daily complementary food energy density for infants and young children,<sup>a</sup> by age group, number of meals per day, and breastfeeding status**

Meals per day	Age group (months)	Breastfed (kcal/g <sup>b</sup> )	Not Breastfed (kcal/g <sup>c</sup> )
One	6.0–8.9	1.43	3.09
	9.0–11.9	1.68	3.01
	12.0–23.9	2.24	3.24
Two	6.0–8.9	0.71	1.54
	9.0–11.9	0.84	1.51
	12.0–23.9	1.12	1.62
Three	6.0–8.9	0.48	1.03
	9.0–11.9	0.56	1.00
	12.0–23.9	0.75	1.08
Four	6.0–8.9	0.36	0.77
	9.0–11.9	0.42	0.75
	12.0–23.9	0.56	0.81

a (Dewey and Brown, 2003a) (Table 3)

b Assuming average breast milk intake

c Total energy requirement + 2 standard deviations (kcal/day) / gastric capacity / number of meals per day

## Development, field testing, and implementation

The first edition of **ProPAN** was developed in 2004 by PAHO in collaboration with a team of nutritionists, anthropologists, epidemiologists, and statisticians from the Rollins School of Public Health at Emory University, the National Institute of Public Health (Instituto Nacional de Salud Pública) in Mexico, and the Institute for Investigation in Nutrition (Instituto de Investigación Nutricional) in Peru. The content was developed through extensive fieldwork over a two-year period in Mexico and Peru, and the final draft was field-tested in Bolivia (Pachón et al., 2002). An additional field test of the software was conducted in Ecuador. Following modifications that were made based on the results of the field tests, the English version of **ProPAN** was further tested in Jamaica, and the Spanish version was further tested in Brazil, Mexico, and Panama (Arabi et al., 2005).

The development of **ProPAN** drew on concepts described in earlier manuals about various aspects of infant and young child feeding, including *Designing by Dialogue* (Dicken et al., 1997), and *Monitoring and Evaluation: A Guidebook for Nutrition Projects Managers in Developing Countries* (Levinson et al., 2000), which had particular influence on Modules II and IV, respectively. Many other elements of **ProPAN**, such as the Food Attributes Exercise and the methodologies used in the *Semi-structured Interviews and Focus Groups*, were adapted from *Culture, Environment, and Food to Prevent Vitamin A Deficiency* (Kuhnlein and Peltó, 1997) and *Community Assessment of Natural Food Sources of Vitamin A: Guidelines for an Ethnographic Protocol* (Blum et al., 1997).

Since its original release, **ProPAN** has been used for assessment, program development, and program evaluation in several different countries and regions, including Bangladesh (Haider et al., 2010 Nov, Rashheed et al., 2011 Sep), Colombia (Programa Mundial de Alimentos, 2005), Ecuador (Lutter et al., 2008), and Panama (Organización Panamericana de la Salud et al., 2003). It has also been used for capacity development in quantitative and qualitative research methods in Guatemala and Mexico (Elena Hurtado, University Research Corps, personal communication) and Peru (Hilary Creed-Kanashiro, Instituto de Investigación Nutricional, personal communication).

From 2010 to 2012, PAHO/WHO and UNICEF, in collaboration with the U.S. Centers for Disease Control and Prevention (CDC) and Rollins School of Public Health at Emory University, updated the content of the **ProPAN** field manual and software package. To facilitate its use worldwide, examples from research conducted in Africa, Asia, and Latin America were added to the updated version of the manual, and the **ProPAN** software program's Food Composition Table was expanded to include foods from all regions of the world. In addition, the **ProPAN** software program was completely rewritten and redesigned to make it more user friendly. This revised version of both the manual and the software has undergone extensive external review and field-testing. Funding for the update was provided in part by the Global Alliance for Improved Nutrition (GAIN), along with in-kind support for the software development from the CDC and the Food and Nutrition Technical Assistance III Project (FANTA).

**ProPAN** is freely available in English, French, and Spanish and can be downloaded at [www.paho.org/ProPAN](http://www.paho.org/ProPAN).

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# Logistics and resource requirements . . .

To be applied successfully, **ProPAN** requires a certain amount of resources in terms of time spent, personnel, equipment, and trainers. The information below provides more details about the inputs required to carry out **ProPAN** as well as guidelines for developing a budget.

## Time frame

It is estimated that a minimum of four months is required to carry out Module I. Assessment and Module II. Testing recommendations and recipes, which provide guidelines for collecting and analyzing quantitative/qualitative data and selecting/testing recommendations, and designing an intervention plan, respectively. The four-month estimate assumes the modules will be carried out in their entirety, by a 13-person team such as the one described in “Personnel”. Increasing the size of the field team and/or applying fewer modules will decrease the required time frame. The time required to implement each the **ProPAN** methodologies will depend on which ones are selected and the training of personnel that is required to carry them out. Table 1 shows an estimate of the required time frame for each module in **ProPAN**.

If the existing or planned feeding program has multiple, distinct target populations (e.g., rural and urban or indigenous and non-indigenous), the activities described in Module I and Module II should be carried out in **communities** representative of each population type. In other words, if there is strong evidence that the target populations differ from each other in significant ways, in terms of their influence on infant and young child nutrition, the added expense of collecting data in communities that represent each type of population is justified. Information gathered in the Identification of the general nutrition situation (Annex I-1) will help the research team make this decision. Factors to be considered include dietary patterns, culture/ethnicity, and the population’s resources.

Different modules of the manual can be used independently from the rest. For example, if a research team has an implementation plan but lacks a monitoring and evaluation system, Module IV. Designing a monitoring and evaluation system can be used independently. If the research team would like to use some of the methodologies and forms described in Module I for a baseline survey or for formative research, this is also possible.

## Personnel

To apply **ProPAN**, it will be necessary to hire individuals for both a coordinating and supervisory role, to conduct the fieldwork and to entry and analyze the data. In cases where **ProPAN** will be used to develop new dietary and feeding programs, the personnel involved in applying **ProPAN** may also be hired to implement the program.

The research team is comprised of an office-based personnel and a field team. The office-based team should consist of a Coordinator, Administrator, Data Analyst, Data Entry person, and Session Facilitator. These positions may be part-time or full-time depending on the needs of the project. The field staff should consist of eight-person teams including two Supervisors and six Field Workers. The suggested background and main tasks of team members are summarized in Table 2.

If Modules I and II are going to be applied among two or more target populations, two or more teams may work concurrently in communities representing each target population, or one team may work over a longer period in all communities representing the different target populations.

It may not be possible to find research team members with the ideal profile. Flexibility and good judgment should be used in these cases. For example, depending on the number of field teams and geographic area covered, one Nutritionist and one Social Scientist could carry out the tasks related to nutrition and social science for all field teams. Similarly, the Supervisors could be very experienced Field Workers, and a Session Facilitator with a social science background could also be the Coordinator or the Supervisor.

## Training

In some cases, the central team will have prior experience in applying the methods described in **ProPAN**. In other cases, it will be necessary to hire a trainer from outside the implementing organization to train personnel in the research methodologies. The **ProPAN** website at [www.paho.org/ProPAN](http://www.paho.org/ProPAN) provides further information on how to identify qualified personnel to ensure the research team has the expertise necessary to implement the **ProPAN** content selected for the research.

## Equipment and materials

The minimum equipment and materials required to carry out **ProPAN** (excluding the costs of actual implementation of the intervention that will be developed) is as follows:

### ***Coordination, supervision, administration and data entry/analysis***

- Access to computers for data entry and analysis
- Access to a printer
- Access to a photocopier
- Reliable transportation to and from the study communities (public transportation, hired drivers, rented or purchased vehicles)

### **Fieldwork**

- Food scales
- Body-weight scales
- Height/length measuring boards
- Mid-upper arm circumference (MUAC) measuring tapes
- Cell phones
- Clipboards
- Pens/pencils
- Bags/backpacks to carry materials
- Local utensils, measuring cups and spoons for the 24-hour Dietary Recall and Anthropometry and Recipe Creation Exercise
- Models of local foods for estimating food weights for the 24-hour Dietary Recall and Anthropometry (optional)
- Reliable transportation to and from study communities.

The UNICEF Supply Division provides information about approved products (and their specifications) for scales, measuring boards, tapes, and other equipment at [www.supply.unicef.dk/catalogue](http://www.supply.unicef.dk/catalogue).

### **Budget**

The line items to be considered when drafting a budget for the application of **ProPAN** are listed in Table 3. Additional costs associated with implementation and monitoring and evaluation of the intervention should also be considered.

**Table 1. ProPAN resource requirements: time frame and personnel**

Module	Time frame (minimum)	Personnel
Module I	9–12 weeks (assuming 5–day work week and including training, data collection, and data entry and analysis)	Coordinator Administrator Supervisors Field workers Data Analyst Data Entry person Session Facilitator Trainer
Module II	3–6 weeks	Coordinator Supervisors Field Workers Data Analyst Data Entry person Session Facilitator Trainer
Modules III and IV	3 weeks	Coordinator Supervisors Field Workers Session Facilitator Data Analyst

**Table 2. ProPAN personnel: suggested experience and main tasks**

Position	Eperience	Tasks
Coordinator	Management and community work	Coordinate and supervise work completed by Administrator, Data Analyst, Supervisors, and Trainers Mobilize and manage resources to ensure timely completion of program activities
Administrator	Accounting	Oversee budget Draw up and execute contracts Ensure timely payment of salaries, per diems, reimbursements, and purchase of equipment and materials
Data Analyst	Programming in Epi Info™	Install <b>ProPAN</b> software program and make any necessary adjustments to ensure its proper functioning Modify (as needed) data entry screens and analysis programs for information collected during application of <b>ProPAN</b> Supervise Data Entry person
Data Entry person	Data entry	Enter data using <b>ProPAN</b> software Review outputs to detect data entry errors or suspicious values Report any suspicious data points to Supervisors

Position	Eperience	Tasks
Session Facilitator	Facilitation of group discussions	Facilitate group discussion and decision-making sessions for all modules (e.g., Step 4 of Module I) Facilitate Focus Group discussions with or instead of Social Scientist Supervisor
Trainer (optional)	Training in area of expertise	Train Supervisors and/or Field Workers in area of expertise
Supervisor (one Nutritionist per field team)	Field work experience in nutrition programs	Modify dietary assessment forms by incorporating local terminology, feeding practices and locally consumed foods Train and supervise the Field Workers applying dietary assessment methods during the application of the <i>ProPAN</i> manual Interpret the results from these methods Provide nutritional expertise during the development of behavioral recommendations (Module I), interpretation of behavioral and recipe trials (Module II), intervention design (Module III) and monitoring and evaluation design (Module IV)
Supervisor (one Social Scientist per field team)	Fieldwork for nutrition programs	Train and supervise Field Workers applying <i>ProPAN</i> qualitative research methods Train and supervise Field Workers in analysis of qualitative data and provide expertise for interpretation of the results Provide guidelines for incorporating qualitative methods in the design of the monitoring and evaluation system
Field Workers (six per field team)	Fieldwork plus expertise in nutrition, nursing, social work, or other health field	Collect, analyze, and interpret information in the study communities using forms and methods described in Modules I and II Present community members' points of view during development of potential recommended practices (Module I) Consider community strengths and weaknesses during development of intervention plan (Module III)

**Table 3. ProPAN budget line items**

Line Item	Description
Personnel	Salary Benefits
Equipment and materials	Computer and computer supplies (memory sticks, surge protector, backup power source) Printer and printer supplies (toner, paper) Paper (for photocopies, printing, and faxes) Office expenses (office rental, electricity and other utilities, custodial and security services, filing cabinets and other storage space, office furniture, telephone service, mail service, fax machine) Food scales with 2-g precision and batteries Body-weight scales with 100-g precision, and batteries Height/length measuring boards with 1-millimeter precision Mid-upper arm circumference measuring tapes with 1-millimeter precision Aids for estimating serving sizes (local utensils, measuring cups and utensils, food models) Cell phones Miscellaneous (backpacks, clipboards, notebooks, pens)
Training	Trainer (transportation, housing, meal per diem, honorarium) Trainees (transportation, housing, meal per diem) Training location (rental) Materials (flip charts, markers, notebooks)
Fieldwork	Field office (rental, furniture, supplies) Meal per diems Transportation (public transportation fares, gasoline for motor vehicles, vehicle rental, vehicle insurance, driver honorarium) Housing allowances

# Module I

## Assessment

### Purpose

This module provides quantitative and qualitative research methodologies and guidelines for characterizing diet of children under 2 years of age and feeding practices of their caretakers. It identifies the cultural, economic, and social reasons behind them, and any factors that could facilitate or hinder adoption of the ideal practices defined in the Introduction. It leads to the formulation and prioritization of recommendations.

The material in this module can also be adapted for use in assessing other practices (e.g., those related to hygiene and food preparation) by adapting the **ProPAN** research methodologies to include them.

The materials in this module largely emphasizes complementary feeding for infants and young children 6.0–23.9 months of age because fewer research tools are available for assessment of the complementary diet and feeding practices compared to breastfeeding. However, the Caregiver Survey (Annex I-3) can also be applied to caregivers of infants under 6.0 months of age for assessment of exclusive breastfeeding practices in that age group. The *Caregiver Survey* also includes questions to assess continued breastfeeding.

As the success or failure of the intervention developed through the application of **ProPAN** methodologies depends in great part on the accuracy of the assessment, the quality of the fieldwork and data analysis conducted in this module is critical.

### Products

The application of this module will enable the research team to identify the following:

- Suboptimal infant and young child feeding practices (i.e., those not aligned with the ideal practices)
- Social, economic, and cultural factors that influence these practices
- Opportunities for improving these practices

### Steps

This module comprises four main steps:

1. *Identification of general nutrition situation* based on analysis of existing health and nutritional data for the country and the target population. Completion of this step will help identify the main nutrition problems that exist in the study communities; the institutions that provide health and nutrition

services; the availability and accessibility of foods; and important cultural, demographic, and socioeconomic differences among subgroups of the target population.

2. *Preparation for fieldwork.* This step includes all activities that need to be completed before data collection begins in the field. These activities include determining sample size, hiring and training personnel, selecting the assessment communities, establishing contacts in these communities, preparing the **ProPAN** computer software program, translating and adapting forms to the local context (if needed), obtaining ethics approval of the study, preparing the informed consent and preparing a work schedule.
3. *Data collection.* In this step quantitative and qualitative research methodologies are applied to obtain information on 1) the nutritional intake of children under 2 years of age, breastfeeding practices, and the feeding practices of their caretakers, and 2) the demographic and socioeconomic characteristics of their families and communities.
4. *Data integration and analysis, and formulation and prioritization of recommendations.* This step entails the integration of the quantitative and qualitative data to identify 1) sub-optimal nutrition and feeding practices and 2) the potential recommendations to be tested, developed, and prioritized in Module II (Testing recommendations and recipes). Software and analysis matrices are provided to aid in the systematic organization of the data collected.

### **Step 1. Identify the general nutrition situation**

Objectives:

- Create an overall summary of the main infant and young child nutrition and feeding problems in the target population and the country
- Identify the general problems related to availability of and access to various foods in the target population
- Determine if the target population contains subgroups with cultural, demographic, and socioeconomic differences that are significant enough to require separate representative samples
- Identify the main ongoing health and nutrition programs, and the organizations involved in them
- Identify Ministry of Health (MoH) norms and policies regarding infant and child nutrition

Information on the nutrition programs and activities being carried out in the country or among the target population is obtained by meeting with representatives from the MoH and main nongovernmental organizations (NGOs) involved in nutrition and health programs. A list of topics for which information should be collected is included in the Document Review Guide (Form I-1.1) in Annex I-1. Once collected, the information should be summarized in writing by the research Coordinator and discussed with the team. The discussion should identify 1) the additional information that needs to be obtained through data collection and 2) the **ProPAN** research methodologies that need to be applied. For example, if the information collected on the target population(s) clearly identifies dietary deficiencies and growth problems, it may not be necessary to apply the 24-hour Dietary Recall and Anthropometry.

Upon completing their review of the general nutrition situation, the research team will be able to complete the following five activities, which should take no more than one month:

1. Identify MoH norms for infant and young child feeding (e.g., schedules for well-child checks and feeding guidelines)
2. Define the type of target populations that need to be represented in the nutrition assessment
3. Identify any information gaps that will require further research using **ProPAN** research tools (i.e., required data not already available through other sources)
4. Select the methodologies and forms to be used in Module I and Module II (based on available time, personnel, and other resources)
5. Identify the persons or institutions that could assist in the interpretation of the data as well as potential users of the research results

To complete activity #4 above, the research team should review the methodologies (see Overview of research methodologies), including their objectives and products (outputs) and the type of information they collect; select the ones most relevant to the research; and determine the outside expertise required to train team members in their implementation (and if it is available in-country or if international experts would be needed). The maximum number of Supervisors and Field Workers that could be hired, based on the available time frame and budget, should also be determined.

For example, if information is needed on the prevalence of inadequate nutrient intakes, applying the 24-hour Dietary Recall and Anthropometry and Caregiver Survey would meet those objectives. If the main priority is obtaining better understanding of why some households practice ideal infant and young child feeding practices and others do not, use of Semi-structured Interviews, Opportunistic Observations and Food Attributes Exercise would be preferable. If the research team has ideas for the intervention that it wants to test and obtain feedback on before implementation, the methodologies in Module II (Testing Recommendations and Recipes) should prove useful.

## Step 2. Prepare for fieldwork

### Hiring personnel

As described in Logistics and resource requirements, a central-level team consisting of a Coordinator, an Administrator, a Data Analyst, a Data Entry person, and Trainers is required. At the field level, two Supervisors and six Field Workers are recommended.

### Determining the sample size

The main goal in determining the sample size (the number of people who will be surveyed) is to capture an accurate representation of infant and young child anthropometry, diets, and feeding practices in the areas under study, without exceeding the resources available for each survey. The factors and guidelines provided here are specific to the sampling requirements for the 24-hour Dietary Recall and Anthropometry and Caregiver Survey (which have a target population of children under 24 months old) and a relatively simple, single survey design for use in a small geographic area (e.g., a district or community).<sup>4</sup>

<sup>4</sup> For information about planning baseline and follow-up surveys, or those performed at a large geographic level (e.g., national- or provincial-level surveys) and thus requiring a complex survey design, see *Indicators and methods for cross-sectional surveys of vitamin and mineral status of populations* at [www.who.int/vmnis/toolkit/mcn-micronutrient-surveys.pdf](http://www.who.int/vmnis/toolkit/mcn-micronutrient-surveys.pdf) and *Nutrition Survey Kit* at <http://www.micronutrient.org/nutritiontoolkit/index.htm>.

Calculating a sample size for a single survey requires the following four values:

1. Estimated percentage of the population that meets some indicator of interest (e.g., “children who are exclusively breastfed”). If the percentage is not known with certainty, use an indicator prevalence of 50% to obtain the largest sample size<sup>5</sup>
2. The confidence interval (CI) (level of certainty that the sample mean or prevalence is an accurate estimate of the population mean or prevalence). Most researchers use a 95% CI, which roughly translates to the estimate capturing the true value in the population 95% of the time
3. The CI width, which describes the precision of the estimate and is usually set between  $\pm 5\%$  and  $\pm 10\%$
4. The size of the eligible target population (e.g., the number of children under 2 years old) in the survey area

The value for item #4 (size of eligible target population in a given survey area) should be determined in the process of preparing the field work early on because many formulas for calculating sample size assume a “large” eligible target population (e.g., in the thousands or higher)—way beyond the number of subjects meeting the study criteria in many smaller survey areas. For example, based on formulas that assume a “large” population, the calculated sample size might be 384 children (given an indicator prevalence of 50%, a 95% CI, and a  $\pm 5\%$  CI width), but in a small geographic area there may not even be 384 children under 2 years old in the population. If this is the case, a smaller sample size may be accommodated by using a wider than usual 95% CI (see Table 1). For example, as shown in the table, if only 100 children in the study area are eligible for the survey (given the parameters described above), the required sample size would be 80. To apply the information provided in Table 1, carry out the following steps:

- a. Determine the desired CI width ( $\pm 5\%$ ,  $\pm 7.5\%$ , or  $\pm 10\%$ )
- b. Determine the size of the target population (from 50 to 1 000 000)
- c. Go to the table column labeled “Target size population” and find the row with the value closest to the target population size
- d. Move to the appropriate column for the desired CI width to find the required sample size (assuming 50% of the children meet some criterion and the CI is 95%)

For example, if a district has an estimated population size of children under 2 years old of 208, and the desired CI width is  $\pm 5\%$ , the closest row value for target population size (based on Table 1) is 210, and the corresponding sample size ( $\pm 5\%$ ) is 137.

One additional step is to account for those who choose to not participate in the survey. The level of participation in surveys differs in geographic areas and generally requires an educated guess. For example, if about 90% of individuals in a specific geographic area are expected to agree to participate in a survey (i.e., 10% are expected to choose to not participate), based on previous survey experiences in the area, the following formula would be used to estimate the level of non-response (rounding the result up to the nearest whole number):

$$\text{Estimated sample size} / \text{response proportion}$$

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5 Generally, several different indicators are assessed in the application of ProPAN, so use of the 50% value is probably reasonable.

If the estimated sample size is 137, and the response proportion (percentage that would agree to participate) is 90%, the number of individuals to invite to participate in the survey would be:  $137 / 0.9 = 152.222$ , or 153 (rounding up to the nearest whole number). In other words, if 153 people are invited to participate in the survey, and 90% agree, the resulting sample would be 137 surveyed individuals.

**Table 1. Required sample size for target population assuming 95% confidence intervals (CIs), three CI widths, and an indicator prevalence of 50%**

Size of target population	CI width			Size of target population	CI width		
	±5%	±7.5%	±10%		±5%	±7.5%	±10%
50	45	39	34	380	192	119	77
60	53	45	38	390	194	119	78
70	60	50	41	400	197	120	78
80	67	55	44	420	201	122	79
90	74	60	47	440	206	124	79
100	80	64	50	460	210	125	80
110	86	68	52	480	214	127	81
120	92	71	54	500	218	128	81
130	98	75	56	550	227	131	82
140	103	78	58	600	235	134	83
150	109	81	59	650	242	136	84
160	114	83	61	700	249	138	85
170	119	86	62	750	255	140	86
180	123	88	63	800	260	141	86
190	128	91	65	850	265	143	87
200	132	93	66	900	270	144	87
210	137	95	67	950	274	145	88
220	141	97	68	1 000	278	146	88
230	145	99	68	1 050	282	147	89
240	148	101	69	1 00	285	148	89
250	152	102	70	1 500	306	154	91
260	156	104	71	2 000	323	158	92
270	159	105	72	3 000	341	162	94
280	163	107	72	4 000	351	164	94
290	166	108	73	5 000	357	166	95
300	169	110	73	6 000	362	167	95
310	172	111	74	7 000	365	167	95
320	175	112	75	8 000	367	168	95
330	178	113	75	9 000	369	168	96
340	181	114	76	10 000	370	168	96
350	184	115	76	100 000	383	171	96
360	187	117	76	1 000 000	385	171	97
370	189	118	77				

In calculating a sample size for a **ProPAN** survey it is important to remember that while the target population is (overall) children under 24 months old, some indicators are restricted to a specific age sub-group (e.g., < 6 months, 6.0–11.9 months, or 12.0–23.9 months), and the CIs for these subgroups will be wider than those for the overall sample. Therefore, to allow for sub-group analysis, three sub-group sample sizes must be calculated in addition to the overall sample size. Table 2 shows the total and sub-group sample sizes required for sub-group analysis with 95% CIs ( $\pm 5\%$ ), given a target population of 100 children 0–23.9 months old and an indicator prevalence of 50%.

**Table 2. Required sample size for sub-group analysis with 95% confidence intervals (CIs) given target population of 100 and an indicator prevalence of 50%**

Age group (in months)	Approximate size of target population	Approximate sample size	Indicator (%)	95% CI ( $\pm 5\%$ ) <sup>a</sup>	
				Lower limit	Upper limit
< 6.0	25	20	50	39.9	60.1
6.0–11.9	25	20	50	39.9	60.1
12.0–23.9	50	40	50	43.0	57.0
All	100	80	50	45.1	54.9

a Incorporates finite population correction.

As shown in Table 2, out of 80 children assessed, about one-fourth would usually be under 6.0 months old and about one-fourth would be 6.0–11.9 months old, resulting in a sample size of 20 for each age group. The CI limits for the sub-groups will be wider (up to  $\pm 10.1\%$ ) than those for the total sample. For example, for children 12.0–23.9 months old, the CI width is  $\pm 7.0\%$  (versus  $\pm 4.9\%$  for all children under 24.0 months old).

### Selecting the sample

In a survey performed in a limited geographic area, the ideal way to select children under 24 months old is to obtain a list of all eligible children living in the target area and select a sample of children from the list. Such lists are often available from the local health center or a recent census. If no list is available, a household-based survey is often used.<sup>6</sup>

While there are many ways to select individuals from a list, the explanation provided here will focus on two commonly used methods: random sampling (the preferred method), and systematic sampling. For both methods, the first step is to develop a list of all eligible individuals and sequentially number them from 1 to the number of eligible individuals (“N”).

*Random sampling.* For random sampling, the next step is to obtain a list of random numbers between 1 and N (this is usually done using a computer program or random number table<sup>7</sup>) and select the individuals corresponding to those numbers on the sequential list of individuals eligible for the survey.

For example, in the case above, in which there were 208 eligible individuals (N), and the sample size (n) was 153 (taking into account the estimated level of non-response), 153 random numbers between 1 and 208 would be needed. The individuals corresponding to each random number on the sequential list of eligible participants would be invited to participate in the survey.

<sup>6</sup> While it is beyond the scope of this manual to describe how to perform a household-based survey, relevant information can be found at [www.who.int/vmnis/toolkit/mcn-micronutrient-surveys.pdf](http://www.who.int/vmnis/toolkit/mcn-micronutrient-surveys.pdf).

<sup>7</sup> See [www.openepi.com](http://www.openepi.com) (select the “random numbers” option), and [www.stattek.com/statistics/random-number-generator.aspx](http://www.stattek.com/statistics/random-number-generator.aspx).

*Systematic sampling.* Another approach to selecting individuals from a list of eligible participants is to select them systematically. The type of systematic selection used depends on the value of the  $N/n$  calculation (i.e., the number of eligible individuals divided by the sample size).

If  $N/n$  is  $> 2$ , the following steps would be carried out to select the individuals to include in the survey:

1. Calculate  $N/n = r$
2. Round the result ( $r$ ) down to the nearest whole number
3. Pick a random number ( $a$ ) between 1 and  $r$
4. Go to that number ( $a$ ) on the sequential list of eligible participants and select the corresponding individual as a survey participant. Then sum  $a$  and  $r$  and select the person corresponding to that number on the sequential list as the next survey participant. Add  $r$  to that number to select the next person, and so on.

For example, if the number of eligible individuals is 900 ( $N$ ) and the sample size is 270 ( $n$ ), calculate  $r$  as  $N/n = 900/270 = 3.33$ , and round  $r$  down to 3. Then pick a random number ( $a$ ) between 1 and 3. For this example, if  $a = 2$ , the second person on the list would be selected as a survey participant. The next person selected would be the fifth person on the list ( $2 + r$  or  $2 + 3 = 5$ ); the following person to select would be the 8<sup>th</sup> person on the list ( $5 + r$  or  $5 + 3 = 8$ ), etc. The first 10 individuals systematically selected for the survey would thus be those listed as numbers 2, 5, 8, 11, 14, 17, 20, 23, 26, and 29 on the sequential list of eligible participants.

If  $N/n$  is  $< 2$ , the following steps would be carried out to select the individuals to exclude from the survey:

1. Calculate  $N/(N-n) = r$
2. Round the result ( $r$ ) down to the nearest whole number
3. Pick a random number ( $a$ ) between 1 and  $r$
4. Go to that number ( $a$ ) on the sequential list of eligible participants and select the corresponding individual to *exclude* from the survey. Then sum  $a$  and  $r$  and select the person corresponding to that number on the list as the next person to exclude. Add  $r$  to that sum to select the next person to exclude, and so on.

The exclusion method is used when the sample size is close to the eligible population size ( $N/n < 2$ ) because the number of individuals to exclude is smaller than the number of individuals to include. For example, if the eligible population size ( $N$ ) is 208, and the sample size ( $n$ ) is 153, only 55 people need to be excluded. Systematic selection of those to exclude ( $r$ ) would be based on the calculation  $N/(N-n)$  or  $208/(208-153) = 3.78$ , with the result rounded down to 3. Based on this calculation, every third person selected from the list would not be surveyed. A random number ( $a$ ) would then be picked between 1 and 3. If  $a$  were 1, for example, the first person on the sequential list of eligible participants would be excluded from the survey. Then  $r$  would be added to the random number ( $1 + 3 = 4$ ). This result would mean the fourth person on the sequential list would be excluded. Then  $r$  would be added to that number ( $4 + 3 = 7$ ), indicating the seventh person on the sequential list would be excluded, and so on. The first 10 people to exclude from the survey would be those corresponding to the numbers 1, 4, 7, 10, 13, 16, 19, 22, 25, and 28 on the sequential list of eligible participants.

### ***Establishing local contacts and obtaining community leaders' approval of the study***

Obtaining the approval and support of well-respected local leaders in the survey areas helps facilitate the research team's entry into the communities. In the application of **ProPAN** methodologies, relevant community leaders will most likely include locally elected authorities, elders, teachers, midwives, health personnel, health volunteers, and religious leaders. Local support of the research from community leaders may also help motivate the population to participate.

Therefore, once the study communities are selected, a visit by the research team should be organized to identify community leaders and arrange a meeting with them. In the meeting, the leaders should be informed of the project objectives, the possible benefits to the community, and the support that will be needed from them. They should also be asked about the best ways to inform and gain access to the community and ensure its participation and support (e.g., organizing a community assembly, or distributing flyers). All interactions with community leaders should be documented, including their names, comments, and approval of the study. Local norms should be used to document the approval of the research (e.g., dissemination of an agreement document listing the names of the majority in consensus, or whatever method is typical for communication with local community leaders).

### ***Preparing the ProPAN software program***

Information collected in the Caregiver's Survey, the 24-hour Dietary Recall and Anthropometry, and the Market Survey can be analyzed using the **ProPAN** software program available at [www.paho.org/ProPAN](http://www.paho.org/ProPAN). The software program contains a Food Composition Table comprising data from the following sources:

- U.S. Department of Agriculture (USDA) National Nutrient Database for Standard Reference, Release 13, updated with Release 23 ([www.nal.usda.gov/fnic/foodcomp/search](http://www.nal.usda.gov/fnic/foodcomp/search))
- National Institute of Public Health of Mexico
- MoH and Pan American Health Organization (PAHO) country office in Panama
- Caribbean Food and Nutrition Institute (CFNI/PAHO) in Jamaica
- Institute of Nutrition of Central America and Panama (INCAP/PAHO)
- Federal University of Pelotas in Brazil
- Kenya, Mexico, Egypt, India, Senegal, and Indonesia, through the WorldFood Dietary Assessment System ([www.fao.org/infoods/infoods/en](http://www.fao.org/infoods/infoods/en))
- Tanzania
- Malawi<sup>8</sup>
- Mali (Barikmo et al., 2004)
- World Food Programme's Food Quality Control website (<http://foodquality.wfp.org>).

The **ProPAN** software allows for the addition of foods to the program's Food Composition Table. It is also possible to import an entire food composition table into the program (if the data file is compatible, or is adapted to be compatible). For further instructions, please see the **ProPAN** Software User's Guide at [www.paho.org/ProPAN](http://www.paho.org/ProPAN).

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<sup>8</sup> UNICEF Malawi office, personal communication.

**Training personnel**

Any research team members who will be supervising or carrying out any of the **ProPAN** research methodologies for the nutrition assessment will need to be trained in administering the **ProPAN** forms (including those with prior experience implementing similar methodologies). In addition, any administration of the forms by two or more individuals must be standardized to ensure all questions are posed to the respondents in the same way. Guidelines for standardizing the collection of anthropometric data by the Field Workers can be obtained from World Health Organization (WHO) at [www.who.org/childgrowth](http://www.who.org/childgrowth). The principles for standardized anthropometric data collection described in the WHO materials can also be applied to the other research methodologies (e.g., Field Workers can practice applying survey forms to persons similar to the sample population, and their performance can be compared with a “gold standard” demonstrated by a trainer or Supervisor).

**Adapting and translating the forms**

All forms applied in the research methodologies must be adapted to the local language and context. In addition, before beginning the Field Worker training, all research methodologies should be carefully reviewed by the Coordinator and Supervisors and modified/adapted as needed. Questions not relevant to the cultural and socio-economic context should be replaced with pertinent ones. Any revisions should be pretested with a few representative survey respondents (caregivers of young children) and modified further if needed.

As mentioned above, the survey forms may also be modified during training and pilot testing (when Field Workers implement the research methodologies with a few representatives of the target population). During pilot testing, any terms not understood by any of the Field Workers or respondents should be systematically compiled and reviewed by the research team to decide if/how they need to be modified.

If the **ProPAN** software will be used to analyze the *Caregiver Survey*, the *24-hour Dietary Recall* and *Anthropometry*, or the *Market Survey*, care must be taken to retain any questions that generate data required for the proper functioning of the software. The fields corresponding to the questions that cannot be eliminated are shown in Table 3.

**Table 3. Data fields required for proper functioning of ProPAN software by research methodology**

Research methodology	Fields that must be complete for proper functioning of the software
Caregiver's Survey	1. Date survey applied 4. Child's code 21. Child's date of birth 22. Child's age in months 23. Child's sex
24-hour Dietary Recall and Anthropometry	1. Child's code 2. Date of interview 5. Child's sex 6. Date of birth 7. Age in months 8. Did child breastfeed yesterday? 15. Mealtime 16. Food or dish code 17. Days consumed 19. Grams consumed
Market Survey	7. Food code 9. Net weight 10–12. Prices

Translation of the **ProPAN** forms and instruction guides presents many challenges. Ideally, these documents would be translated to the target language and then back-translated to the original language (English, French, or Spanish) to ensure the meaning has been preserved. Individuals carrying out the translation must be familiar with terminology and concepts related to infant and young child feeding. Translation usually takes several weeks to complete. It is preferable to translate the forms and instruction guides before training the Supervisors and Field Workers as staff training (along with pilot testing) provides an excellent opportunity to test out the materials and solicit suggestions on how to improve the translation.

### ***Obtaining ethical approval and preparing informed consent***

Before initiating the fieldwork, ethical approval of the study must be obtained from an independent ethics review committee or [institutional review board \(IRB\)](#).

Before applying any questionnaires, Field Workers should explain to the caregivers why they are being sought for interviews and request their consent to participate in the study. The request for consent can be verbal or written (see the sample [Consent Letter and Form, Form I-2.1](#), in Annex I-2).

Field Workers should always carry identification and a letter describing the research and explaining their presence in the community.

### ***Preparing a work schedule***

The time required to complete the [Assessment \(Module I\)](#) will depend on a number of factors, including

the number of research methodologies that are applied, the number of Supervisors and Field Workers that will be hired, and the number of locations where the assessment is carried out. A general estimate for the time required to complete Module I in its entirety (assuming a 5-day work week), including training, data collection, and data entry and analysis, is 9–12 weeks (see Table 4).

The time required to complete the activities for Step 2 (“Preparation for fieldwork”) is not specified in the work schedule because it depends on a wide range of factors (including the previous experience of the Coordinator and the Supervisors, and the administrative procedures entailed in obtaining the personnel and equipment specified in the chapter on [Logistics and resource requirements](#)).

**Table 4. Suggested work schedule and sequence of activities for Module I (assuming two Supervisors and six Field Workers per site)**

Activities	Weeks											
	1	2	3	4	5	6	7	8	9	10	11	12
Step 1. Identify the nutrition situation												
Document Review	X	X	X	X								
Step 2. Prepare for fieldwork <sup>a</sup>												
Step 3. Collect the data												
Training of Supervisors and Field Workers for					X	X						
Caregiver Survey,												
24-hour Dietary Recall and Anthropometry,												
Market Survey, and												
Opportunistic Observations; translating and												
modifying forms												
Caregiver Survey and 24-hour Dietary Recall							X					
and Anthropometry												
Market Survey								X				
Rapid analysis of 24-hour Dietary Recall and								X				
Anthropometry and Market Survey to define												
Key Foods List												
Training of Supervisors and Field Workers									X			
for Semi-structured Interviews and Food At-												
tributes Exercise; translating and modifying												
forms												
Opportunistic Observations	Ongoing (carried out at convenient times as schedule allows)											
Semi-structured Interviews										X		
Food Attributes Exercise (including sum-										X		
mary)												
Step 4. Integrate and analyze the data, and formulate and prioritize the recommendations												
Completion of matrices											X	
Definition and prioritization of recommend-												X
ed practices												

a No estimates are provided for completion of this step due to the wide range in time required.

### Step 3. Collect the data

#### Objectives:

- Characterize feeding practices and levels of dietary inadequacy for the most important nutrients (e.g., vitamin A and iron) in children 6.0–23.9 months old
- Determine the main institutional, community, social, cultural, familial, and individual factors influencing breastfeeding and complementary feeding practices
- Identify any facilitators or barriers (factors that facilitate or prevent improvement of the identified practices and problems).

A combination of quantitative and qualitative research methodologies can be used to complete the nutrition assessment. These include the *Caregiver Survey*, the *24-hour Dietary Recall and Anthropometry*, the *Market Survey*, *Opportunistic Observations*, *Semi-structured Interviews*, and the *Food Attributes Exercise*. Table 5 lists six **ProPAN** research methodologies and the respondents required for and information generated by each one.

**Table 5. Six ProPAN research methodologies:  
respondent requirements<sup>a</sup> and information generated**

Research methodology	Type of data collected	Type and suggested minimum number of respondents
Caregiver Survey	Breastfeeding and complementary feeding practices Other information to be used in the design of intervention strategies	Mothers and other caregivers of children 0–23.9 months old; minimum sample depends on sample size calculations (see Step 2)
24-hour Dietary Recall and Anthropometry	Dietary intake and complementary feeding practices Child's weight, height, and mid-upper arm circumference Other information to be used in the design of intervention strategies	Caregivers of children 6.0–23.9 months old; minimum sample depends on sample size calculations (see Step 2)
Market Survey	Accessibility as a potential reason for limited consumption of foods Other information to be used in the design of intervention strategies	Food vendors (owners/staff of grocery stores or markets); minimum sample: 5
Opportunistic Observations	Current complementary feeding practices Reasons for current practices and the potential for change Other information to be used in the design of intervention strategies	Caregivers of children 0–23.9 months old <sup>9</sup> ; minimum sample: 15
Semi-structured Interviews	Current breastfeeding and complementary feeding practices Reasons for current practices and the potential for change Other information to be used in the design of intervention strategies	Caregivers of children 0–23.9 months old; minimum sample: 15
Food Attributes Exercise	Reasons for current practices and the potential for change Other information to be used in the design of intervention strategies	Caregivers of children 6.0–23.9 months old; minimum sample: 10

<sup>a</sup> In theory, more than one **ProPAN** survey can be administered to the same respondent(s). However, completing the surveys can be very time-consuming, so the research team may not want to apply more than two to any one caregiver.

<sup>9</sup> Children 0–5.9 months old are included because they may be receiving complementary foods.

One of the Supervisor's roles during data collection is to ensure the quality of the information being gathered. One way to achieve this is for the Supervisors to visit 5% of the homes interviewed, re-administer the forms applied by the Field Workers, and then compare and reconcile any inconsistencies with the Field Workers. This exercise will also allow the Supervisors to determine if any Field Workers need refresher training.

See the Overview of research methodologies in this module for more information about the research methodologies, and [Annexes I-3 to I-9](#) for guidelines on how to apply them.

## Step 4. Integrate and analyze the data, and formulate and prioritize the recommendations

Objectives:

- Summarize the family and community context and any cultural concepts related to current breastfeeding and complementary feeding practices
- Identify facilitators of and barriers to ideal practices for breastfeeding and complementary feeding ([Matrix I-10.1](#))
- Summarize information about the foods ([Matrix I-10.2](#))
- Formulate recommendations for improving suboptimal breastfeeding and complementary feeding practices that are feasible to implement given the family, community, and cultural context ([Matrix I-10.3](#))
- Prioritize the final recommendations by evaluating the potential impact and feasibility of each one ([Matrix I-10.4](#)), which will be tested in [Module II](#).

### Integrating the data

The data on breastfeeding and complementary feeding practices, collected primarily through the *Care-giver Survey* and the *24-hour Dietary Recall and Anthropometry*, will be integrated with the data on facilitators and barriers, identified mainly in *Opportunistic Observations*, *Semi-structured Interviews*, the *Food Attributes Exercise*, and the *Market Survey*.

These data can then be summarized using the [Matrix for summarizing facilitators of/barriers to ideal practices \(Form I-10.1\)](#) in Annex I-10, including the information collected about each ideal practice (see [Table 1 in the Introduction](#)). Only one ideal practice should be analyzed per form to ensure all relevant information collected with each different research methodology is included. As shown in the sample matrix in Table 6, the first row will list the ideal practice being summarized, and the second row will list the [current practices](#). As some current practice will match the ideal practice, while others may not, the second row may include both positive and negative findings.

**Table 6. Sample matrix summarizing facilitators of/barriers to ideal practices**

Ideal practice 11. All infants and young children 6.0–23.9 months old are fed by a caregiver who is responsive to the child  
 Current practice: For all caregivers interviewed, only 16.9% of the corresponding children were supported and motivated to eat to satiety

Barriers		Facilitators	
Internal	External	Internal	External
Takes too much effort for mother or other caregiver	Father does not have time to help with child feeding	Mother or other caregiver wants to do what is best for the child	Grandmother helps with housework so that caregiver can patiently feed child

Source: Data from research carried out in Bangladesh, Tina Sanghvi, Alive & Thrive Project, FHI360, personal communication.

The first two data columns should list all identified barriers to compliance with the ideal practice. These can be internal or external to the caregiver. For example, caregivers often administer water or other liquids to infants because they think infants are thirsty even if they are exclusively breastfed. Caregivers' belief that breast milk does not quench thirst is an internal barrier to exclusive breastfeeding (which could be addressed in an intervention). Another example of an internal barrier to exclusive breastfeeding was found among Thai caregivers, who said they gave water to infants to help "clean" their mouths.<sup>10</sup>

The third and fourth data columns should list all identified facilitators of compliance with the ideal practices (internal and external). An external facilitator might be the availability of certain foods (e.g., "low-cost animal-source foods"). This type of facilitator could be included as a motivating factor when formulating the recommendations to be promoted in an intervention.

An optional food matrix listing key foods and their attributes can also be completed (see [Matrix for listing key foods, Form I-10.2](#)). It is advantageous to have this information on a separate list so that appropriate food items can be selected for incorporation into the recommended practices. As shown in the sample matrix listing key food attributes, consumption frequency, contribution to diet, cost-benefit, seasonality, and method of preparation/feeding (Table 7), the key foods are listed in the first column and the positive and negative attributes ascribed to them by caregivers are listed in columns 2 and 3. This information can be derived from the [Food Attributes Exercise](#) and the [Semi-Structured Interviews](#). Positive attributes are those that foment consumption of the foods by infants and young children and negative attributes are those that limit or prohibit consumption of the foods. Consumption frequency and contribution to the diet can be determined using the *24-hour Dietary Recall and Anthropometry*. Consumption frequency refers to the number of times per week (or some other frequency, depending on what is reported in the *Food Attributes Exercise* or the *Semi-Structured Interviews*) the food is currently consumed by children, "Contribution to diet" refers to the proportion of energy and nutrients the food contributes to the child's intake, according to the *24-hour Dietary Recall and Anthropometry*. Information about cost-benefit and [seasonality](#) can be derived from the *Market Survey*. "Cost-benefit" refers to the quantity of energy or nutrients the food provides for one unit of local currency. For example, in Table 7, the amount of chicken liver that can be purchased for one Mexican peso (MX\$1) contains 20 mg of iron. "Seasonality" refers to the time of the year when the food can be purchased locally. Information on the "Method of preparation or feeding" (the different ways in which key foods are cooked for infants and young children, and the types of foods they are typically combined with) can be derived from the *24-hour Dietary Recall and Anthropometry*, the *Food Attributes Exercise*, *Opportunistic Observations*, and *Semi-structured Interviews*.

<sup>10</sup> Pattanee Winichagoon, Mahidol University, personal communication.

**Table 7. Sample matrix listing key food attributes, consumption frequency, contribution to diet, cost-benefit, seasonality, and method of preparation/feeding**

Food	Positive attributes	Negative attributes	Frequency of consumption	Age of child when first given	Contribution to diet	Cost-benefit	Seasonality	Method of preparation or feeding
Chicken liver	Good for child; something special	Child doesn't like it; tastes bitter; hurts child's stomach	Once a week	5–6 months	10%	MX\$1 for 20 mg of iron	Year round	Fried In pasta or soup With refried beans

Source: Data from research carried out in Mexico; costs expressed in Mexican pesos.

### Analyzing the data

In the data analysis, barriers to the ideal feeding practices are examined in detail. To begin the analysis, barriers to ideal practices should be compiled using the Matrix for summarizing barriers to recommended practices (Form I-10.3). In the column to the right of each barrier, practices addressing each barrier should be proposed. The recommended practices should incorporate the facilitating factors to the ideal practices.

While the Assessment was focused on caregivers, the recommendations can be geared to health-care providers, teachers, religious leaders, etc. For example, one recommendation to help increase exclusive breastfeeding and continued breastfeeding among women working in factories in El Salvador was for employers to provide and equip a small room (other than a toilet facility) for women to safely express and store their milk.

Recommended practices can be new practices or modifications of existing practices. One recommended practice could target two or more barriers simultaneously. For example, the recommendation to “combine one or more foods of animal origin with tortillas during each meal” could address the following barriers: “Children are served small quantities” and “Children are served foods of animal origin infrequently.”

The content and wording of the recommendations is very important. They should clearly articulate what the individual should do in relation to infant and child feeding (and not what she should know). Stating what an individual should know instead of what she should do is the most frequent error in the formulation of recommendations. Recommended practices must not be confused with intervention messages (which are developed in Module II and Module III, and include motivational elements and benefits to encourage the individual to try the practice). Table 8 provides sample matrix data for recommended practices and potential barriers.

**Table 8. Sample matrix summarizing barriers to ideal practices and recommended practices**

Barriers to ideal practices	Recommended practices
Newborns not fed until mother and baby are cleaned	Traditional birth attendant to put baby to breast immediately after childbirth and before cleaning mother and baby <sup>a</sup>
“Good foods” (nutrient-dense) are expensive	Father to buy locally produced “good foods” <sup>ab</sup> for baby
Spicy foods not fed to children even though they tend to be nutrient- and energy-dense	Caregiver to set aside portion of family’s food for baby before adding chili spice to family pot If family foods prepared with chili spice, family cook to wash portions of foods with water or dip in lentils to remove spices and thus make portions available for the child so she/he can eat more”
Mother cannot spend more time responsively feeding child because of house-cleaning duties	Grandmother, father, and older children to complete one or more of mother’s house-cleaning duties on a daily basis

Source: Adapted from a matrix completed for research carried out in Bangladesh, Tina Sanghvi, Alive & Thrive Project, FHI360, personal communication.

a Applying Module II (*Testing recommendations and recipes*) will yield barriers to traditional birth attendants adopting this recommendation. Those barriers can then be used to formulate better recommendations to be promoted with traditional birth attendants.

b Affordable foods that could be recommended can be identified using the *Market Survey*, the *Food Attributes Exercise*, and *Opportunistic Observations*.

Not all recommendations that appear promising in theory are useful in actual practice. Behaviors are almost always more complex than apparent at first glance. What may seem like a simple practice (e.g., “Combining foods such as rice, beans, noodles, or eggs with tortillas in each meal”) can require a series of steps, some of which require new skills, or additional time and economic resources.

A special set of criteria has been developed for systematic evaluation of potential recommended practices in terms of their impact on diet and feeding practices, feasibility, and observability. These criteria are explained below.

**Impact criterion.** The first criterion to consider in the selection of the recommended practices is nutritional impact. For each recommendation, the research team should analyze the *potential for impact on nutritional status*. The analysis should be based on existing clinical or epidemiological information, so it may be necessary to consult with a specialist to ensure proper scoring for this criterion. Sample scores and their definitions are shown below.

- *Potential for impact on nutritional status.* What impact would the adoption of the recommended practice have on the nutritional problem to be addressed?
  - 0: no impact
  - 1: some impact
  - 2: would eliminate the problem

If the score is “0,” the recommended practice can be eliminated from the list. If the score is “1,” but the score for any of the feasibility criteria is low, the research team should determine if there is an intermediate point between the barrier and the recommended practice that would still have an impact on the nutritional problem. The recommended practices selected for the intervention should be the most feasible to adopt and with the greatest *potential for impact on nutritional status*.

**Feasibility criteria (potential for compliance or change).** A set of criteria can be used to evaluate the feasibility of each proposed recommended practice to result in improved practices.

To score the recommended practices for feasibility criteria, a meeting should be organized with an interdisciplinary team composed of a Session Facilitator (someone who knows the project and the methodology but will only participate as a discussion Moderator), the Coordinator, both Supervisors, and the Field Workers who participated in the data collection. All recommended practices should be scored for each feasibility criterion by each member of the team, using the Matrix for analyzing impact, feasibility and observability of recommended practices (Form I-10.4), in Annex I-10. Each team member should explain to the rest of the team what score he/she gave for each criterion, for each recommendation, and why. The reasons given for the scoring, and the main points of the discussion, should be noted. Once all scores from all research team members regarding one specific recommended practice have been determined, and all the reasons for the scoring have been explained, an average score for each recommended practice should be calculated. The average scores for all of the feasibility criteria for each recommended practice should then be added. The recommended practices with the highest scores will be, in theory, the most feasible for individuals to adopt.

- *Positive consequences.* In the assessment, does the recommended practice have *positive consequences* (i.e., pleasant or favorable outcomes) that are immediate and perceivable by the person who will adopt it?
  - 0: no positive consequences (and maybe even some negative consequences)
  - 1: very few or some
  - 2: many or a significant number
- *Compatibility with beliefs and knowledge.* Do targeted individuals have *beliefs or knowledge* that are compatible with complying with the recommended practice?
  - 0: beliefs/knowledge are incompatible with the recommended practice
  - 1: beliefs/knowledge are somewhat compatible with recommended practice
  - 2: beliefs/knowledge are compatible with the recommended practice
- *Cost in terms of cash or in-kind resources.* Are additional *monetary or material resources* required to comply with the recommended practice?
  - 0: requires significant additional resources
  - 1: requires few additional resources
  - 2: requires no additional resources or resources already available to the person
- *Cost in time and/or effort.* Are additional *time and/or effort* required from the targeted individual to comply with the recommended practice?
  - 0: requires significant time and/or effort; is not realistic
  - 1: requires some time and/or effort
  - 2: requires very little time and/or effort
- *Complexity.* From the point of view of the targeted individual, how complex is the recommended practice in terms of the number of steps it requires?

- 0: too complex as it requires too many steps (five or more)
- 1: requires several steps (three to four)
- 2: requires only a few steps (one or two)

*Observability criterion.* The evaluation of the criterion for observability (the potential ability of a Field Worker to observe whether a person follows a recommended practice) is optional and can be performed as part of Module IV (Designing a monitoring and evaluation system).

- *Observability.* Could compliance or noncompliance with the recommendation by targeted individuals be observed by Field Workers in the environment in which it would occur?
  - 0: cannot be observed
  - 1: can be observed (but would be somewhat difficult to observe)
  - 2: can be easily observed

Table 9 is a sample matrix analyzing the impact, feasibility, and observability of recommended practices from research conducted in Bangladesh. Two recommended practices were scored by members of an interdisciplinary team for impact, feasibility, and observability criteria.

**Table 9. Sample matrix analyzing recommended practices for impact, feasibility, and observability**

Criteria	Recommended practices	
	For fathers, mothers, and grandmothers “Each time you bring home fish, feed it to the child”	For family cooks “Set aside portion of food for baby before adding chili spice to family pot”
1. Impact	1	1
2. Positive consequences	1	1
3. Compatibility with beliefs and knowledge	1	1
4. Cost in material and monetary resources	2	2
5. Cost in time and/or effort	1	1
6. Complexity	1	2
Feasibility (sum of scores for criteria #2–6)	6	7
7. Observability	1	2
Impact, feasibility, and observability (sum of scores for criteria #1–7)	8	10

Source: Adapted from a matrix completed for research carried out in Bangladesh, Tina Sanghvi, Alive & Thrive Project, FHI360, personal communication.

### Selecting potential recommended practices

The intended output of this exercise is a list of the recommendations considered to have potential for improving the diet and feeding practices of infants and young children. This list should include the recommendations that will be tested in [Module II](#) (Testing recommendations and recipes) as well as those that are considered important but cannot be tested for one or all of the criteria (e.g., acceptability of a fortified [complementary food](#) in a community where no social program exists to enable to the free provision of it).

This information should be used to complete the [Final matrix for recommended practices](#) (Form I-10.5). Table 10 shows an example of a completed matrix. The matrix's first column shows the barrier that should be addressed. The second column shows the potential recommendations selected for testing in Module II. The last column shows the recommendations that cannot be tested but might help reduce the problem practice and thus should probably be promoted in an intervention. The last column can also be used to list any facilitators that emerged in the data summarized in [Form I-10.1](#).

After completing the matrix, testing of the recommendations in caregivers' homes, health centers, or other relevant places (described in Module II) can be carried out.

**Table 10. Sample matrix summarizing potential recommended practices**

Barriers	Potential recommendations selected for testing in Module II	Recommended practices that cannot be tested but will be promoted
Quantities of complementary foods fed to children are insufficient to meet energy recommendations	"Wash portions of family foods with water or dip in lentils to remove spices to make portions available for the child so she/he can eat more" "Each time you bring home fish, feed it to the child"	For family members: share household chores so that caregivers have time to adequately feed the baby

Source: Data from research carried out in Bangladesh, Tina Sanghvi, Alive & Thrive Project, FHI360.

## Overview of research methodologies

### Caregiver Survey (Annex I-3)

#### Objectives

- Identify current breastfeeding and complementary feeding practices
- Compare current practices with the ideal practices defined in [Table 1 in the Introduction](#) and determine the adequacy of the current practices
- Compare current practices with WHO/UNICEF indicators for assessing infant and young child feeding practices (WHO and partners, 2008)

- Collect information that will help clarify the context in which the current breastfeeding and complementary feeding practices occur
- Collect data to help guide the development of the intervention plan (e.g., knowledge of feeding practices to prevent mother-to-child transmission of HIV, sources of information on child feeding, communication channels with the best reach to caregivers, use of health services by caregivers, etc.)

### **Products**

- Percentage of children
  - ever breastfed
  - breastfed within one hour of birth
  - not fed anything other than breast milk during first three days of life
  - breastfed colostrum
  - breastfed on demand, day and night
  - who began complementary feeding with semi-solid foods at 6.0 months of age (180 days)
  - breastfed up to 2 years
  - breastfed at 1 and 2 years of age
  - 6.0–23.9 months old who are responsively fed
  - bottle-fed
  - fed as recommended during and after illness
- Knowledge and practices related to infant and child feeding within the context of HIV/AIDS
- Summary of the context in which feeding occurs (e.g., family socio-demographic characteristics, housing conditions, reach of main communication channels, consumption of micronutrient supplements, use of health services, etc.)

### **24-hour Dietary Recall and Anthropometry (Annex I-4)**

#### **Objective**

- Identify current complementary feeding practices
- Compare current complementary feeding practices with the ideal practices defined in Table 1 in the Introduction and determine the adequacy of the current practices
- Determine adequacy of energy, protein, iron, zinc, vitamin A, vitamin C, and calcium intake
- Identify other complementary feeding practices that affect macro- and/or micronutrient intake
- Obtain information that will be used to develop the Key Foods List

- Generate information that can be used in WHO's *Optifood* software program<sup>11</sup>
- Assess children's nutritional status (if anthropometric data is collected)

### **Products**

- Percentage of infants and young children who consumed foods in previous 24-hour period
- Percentage of children
  - meeting their energy and nutrient requirements
  - consuming foods with recommended nutrient and energy density
  - consuming a diet with recommended nutrient and energy density
  - with minimum meal frequency
  - with minimum dietary diversity
  - consuming minimum acceptable diet
  - consuming iron-rich or iron-fortified food
  - with malnutrition (indicators of undernutrition and overweight and obesity)
- Percentage of non-breastfed children consuming non-human milk
- Sample's socio-demographic and morbidity profile
- Inputs for development of *Key Foods List*
- Inputs for WHO's *Optifood* software program

### **Market Survey (Annex I-5)**

#### **Objectives**

- Identify locally available foods that provide the greatest amount of energy and nutrients for the least cost (nutrient/cost ratio)
- Determine the seasonality and availability of specific foods
- Obtain information that will be used to develop *Key Foods List*
- Generate information that can be used in WHO's *Optifood* software program

<sup>11</sup> A software program developed by WHO and its partners as a research tool for 1) formulating and testing food-based recommendations, 2) selecting the lowest-cost nutritionally optimal diet for a target population, and 3) identifying nutrient requirements that may be difficult to meet through diets based on locally available foods.

### **Products**

- Ranked lists of local foods that provide the greatest amount of energy and nutrients (protein, iron, zinc, vitamin A, vitamin C, and calcium) for the least cost
- Calendar listing months of year in which certain foods can be found locally
- Inputs for generating the *Key Foods List*
- Inputs for WHO's *Optifood* software program

### **Key Foods List (Annex I-6)**

The creation of the *Key Foods List* is an intermediate activity carried out before applying the *Food Attributes Exercise*. Once data collection for the *24-hour Dietary Recall and Anthropometry* and the *Market Survey* is complete, a rapid analysis of the results will produce the information required for the *Key Foods List*.

### **Objective**

- List available foods potentially important for promoting an intervention for children 6.0–23.9 months

### **Product**

- List of 25–30 key foods, including those produced in the home, gathered in the wild, or purchased in the commercial sector, with a focus on those that are nutrient-rich, enriched, or fortified. The list should include energy-rich, animal-source foods that are good sources of protein and/or micronutrients (iron, zinc, vitamin A, vitamin C, and calcium) and other foods considered potentially important in terms of nutrition. Low-nutrient foods and those that only provide energy should not be included. The list will be used in the *Food Attributes Exercise*.

### **Opportunistic Observations (Annex I-7)**

### **Objectives**

- Identify the context of feeding behaviors and observe interaction between caregiver and child during child's mealtime
- Assess caregiver's feeding style and identify facilitators of and barriers to the ideal practice of responsive feeding
- Observe other aspects of food preparation and feeding (e.g., hygiene and the use of bottles, spoons, and other utensils)

### **Products**

- List and identification of facilitators of and barriers to the ideal practice of responsive feeding

**Semi-structured Interviews (Annex I-8)****Objectives**

- Identify current breastfeeding and complementary feeding practices
- Understand reasons behind these practices
- Identify facilitators of and barriers to each ideal practice for breastfeeding and complementary feeding
- Identify practices that could potentially be improved so that caregivers' behaviors more closely resemble ideal practices

**Products**

- Summary of current breastfeeding and complementary feeding practices
- Summary of facilitators of and barriers to each ideal practice for breastfeeding and complementary feeding

**Food Attributes Exercise (Annex I-9)****Objectives**

- Identify positive and negative characteristics attributed to key foods by caregivers
- Determine which key foods are fed to children, and why
- Identify at what age key foods are offered to children for the first time, how they are prepared for children at that age, and how they are prepared for older children
- Explore conditions and changes required for caregivers to offer nutrient-rich foods not currently offered to infants and young children

**Products**

- Summary of key foods that are offered to children and those that are not, and the reasons why
- List of positive and negative characteristics attributed to each key food by caregivers
- Information about the age at which each food was offered for the first time, how it was prepared, and how it is prepared now
- List of conditions and changes that would be required for each potential food to be offered to young children



## Annex I-1: Identification of the general nutrition situation

### **Objectives**

- Identify the main problems with infant and child nutrition and dietary and feeding practices country-wide and within the target population
- Identify any problems with the target population's access to key foods (availability and accessibility of foods)
- Determine if the target population contains subgroups with cultural, demographic, and/or socioeconomic differences significant enough to require separate representative samples
- Identify any existing health and nutrition programs and the organizations that are involved in them
- Identify the main norms and policies of the MoH, other governmental organizations, and NGOs regarding infant and young child nutrition

### **Product**

- Summary of main findings about the general nutrition status of the target population, based on an overview of all relevant information

### **Steps**

The main steps for completing this part of the nutrition assessment are 1) identifying, retrieving, and producing a general overview of all relevant information about the general nutrition status of the target population, and 2) preparing a summary of the main findings. The general overview should be based on a review of all available documentation, and informal meetings with people or organizations involved in nutrition.

#### **1. Information search and retrieval**

In many countries, the dissemination of information about the nutrition status of the population is minimal or nonexistent. Reports on projects or studies that have been carried out tend to stay in the libraries of the organizations that implemented or financed them, or at the MoH. Therefore, in many cases, the best sources for documentation on a specific population's nutrition status include the MoH, international development organizations such as WHO, PAHO/WHO, UNICEF, World Food Program and national and international NGOs, and universities.

To target the information search, a list of desired documents and their potential sources should be developed. This may include the following:

- MoH reports, protocols, and norms on infant and young child nutrition (potential source: local health clinics)
- Lists of people and organizations working in the area of nutrition (potential source: local universities, MoH)
- Project or program reports, protocols, and norms for projects or programs (potential source: program headquarters)
- Monographs (potential sources: nutrition departments of medical universities, national health libraries)
- National, regional, and local surveys on nutrition and health, health providers, micronutrient status, and anthropometry (potential source: MoH national office).

In certain countries, nationally representative household surveys known as DHS (Demographic and Health Surveys) and MICS (Multiple Indicator Cluster Surveys) are available as a source of nutrition data. Country DHS and MICS reports and information on how to obtain datasets for secondary analysis can be found at [www.measuredhs.com](http://www.measuredhs.com) and [www.unicef.org/statistics/index\\_24302.html](http://www.unicef.org/statistics/index_24302.html)

## **2. Overview and summary of findings**

Producing the summary of findings should take about 2 weeks (see Table 4 in Module I). Each of the 24 topics listed in the [Document Review Guide \(Form I-1.1\)](#) for review and summary of nutrition documentation should be addressed in the summary. Detailed information about the target population's nutrition status is not necessary as only general data are needed to implement the **ProPAN** research methodologies. No specific format is required. For example, a summary of the general nutrition situation for research carried out in Malawi (PATH Infant and Young Child Feeding Project, 2011) consisted of two main sections ("Malnutrition with information on child anthropometry, and household poverty and food insecurity," and "Feeding practices for children under 2 years old, by age and health status of child").

### Document Review Guide (Form I-1.1)

Write a short summary for each of the 24 topics listed below.

#### Nutrition-related statistics

1. Overall mortality, morbidity, and immunization rates
2. Children's height-for-age, weight-for-age, and weight-for-height indicators
3. Deficiencies in iron, iodine, vitamin A, zinc, and other micronutrients
4. Prevalence of low birth-weight
5. Main childhood health and nutrition problems

#### Nutrition-related norms

1. Well-baby visits (MoH, other governmental, and nongovernmental organizations working in health and nutrition)
2. Growth monitoring and development visits (MoH)
3. Food distribution programs, including fortified foods (MoH)
4. Distribution of capsules of vitamin A, iron, and other micronutrients (MoH)
5. Newborn feeding (MoH)
6. Feeding of children under 2 years of age (MoH, other governmental, and nongovernmental organizations working in health and nutrition)
7. Infant feeding within the context of HIV/AIDS (MoH)

#### Nutrition-related resources and services

1. Organizations (indigenous, governmental, and nongovernmental) working in health and nutrition
2. Types of interventions being implemented to address infant and young child nutrition
3. Health services available to the community

#### Target population socio-demographic characteristics

1. Family size
2. Ethnic group
3. Perceptions and beliefs about infant and young child health and nutrition
4. Health-seeking behaviors
5. Infant and young child feeding practices
6. Income and expenditure
7. Housing conditions
8. Employment
9. Percentage of women in the workforce

## Annex I-2: Participant consent

### Consent Letter and Form (Form I-2.1)

[city] / [month] / [year]

Dear Ms. [name of caregiver]:

You are cordially invited to participate in a study about feeding practices of children under 2 years of age. If you decide to participate, I will ask you questions about [child's name], such as, for example, the age at which [child's name] was first offered foods other than breast milk, how many times a day [child's name] eats, how much of each food [child's name] eats, and how you prepare the foods for [child's name]. It will take approximately [amount of time in minutes or hours].

You have the right to decline to participate, and you also have the right to leave the study at any time. The information you will provide during the interviews is strictly confidential, will only be available to the project investigators and no one else. Declining to participate will not affect your access to health and nutrition services offered in the community.

There will be no immediate benefit for you or [child's name] for participating in this project. However, the information you provide will help strengthen child nutrition programs in [country/region]. Participation in the project poses no risk to you or [child's name].

If you have any questions, comments, or complaints about the study, please contact [name of Study Coordinator], Study Coordinator, by calling [telephone number].

Sincerely,

---

[name and title of Study Coordinator]

---

[institution]

---

[address and phone numbers]

**CONSENT FORM**

I AGREE TO PARTICIPATE IN THIS STUDY: YES ( ) NO ( )

NAME: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ OR FINGER PRINT:

DATE: \_\_ \_\_ / \_\_ \_\_ / \_\_ \_\_

FIELD WORKER'S NAME AND CODE: \_\_\_\_\_

FIELD WORKER'S SIGNATURE: \_\_\_\_\_

Provide the caregiver with the consent letter.

The project coordinator should keep the signed consent form in file.

## Annex I-3: Caregiver Survey

### **Objectives**

- Identify current breastfeeding and complementary feeding practices
- Determine the adequacy of current caregiver practices by comparing them with the ideal practices defined in Table 1 in the Introduction
- Compare current practices with international indicators for assessing infant and young child feeding practices
- Collect information that will increase understanding of the context in which current breastfeeding and complementary feeding practices occur
- Obtain information that will help guide the development of the intervention plan (e.g., caregivers' knowledge of feeding practices for prevention of mother-to-child transmission of HIV, sources of information on child feeding, preferred channels of communication, and use of health services)

### **Products**

- Percentage of children
  - ever breastfed
  - breastfed within one hour of birth
  - not fed anything other than breast milk during first three days of life
  - breastfed colostrum
  - breastfed on demand, day and night
  - who began complementary feeding with semi-solid foods at 6.0 months of age (180 days)
  - breastfed up to 2 years
  - breastfed at 1 and 2 years of age
  - 6.0–23.9 months old who are responsively fed
  - bottle-fed
  - fed as recommended during and after illness
- Knowledge and practices related to infant and young child feeding within the context of HIV/AIDS
- Summary of the context in which feeding occurs (e.g., family socio-demographic characteristics, housing conditions, reach of main communication channels, consumption of micronutrient supplements, use of health services, etc.)

## Steps

### 1. Preparation and planning

Adapt the survey to the local context as follows:

- Before beginning data collection, all forms that will be used should be reviewed, critiqued, and adapted for the local context. Adaptations may entail adding questions, using different terminology (e.g., replacing the term *health center* with *health clinic*), adding or modifying answer options (e.g., redefining what is “best,” “average,” or “worst” in terms of floor, roof, and wall materials in the section about housing), or any other changes deemed necessary by the Coordinator. If changes are made, the revised forms must be validated (tested) in the study communities. If possible, validation should be completed before training the Field Workers. Depending on the results of the training sessions and the pilot testing, additional modifications (and testing) may be required.
- Visit the communities that will be sampled and contact community leaders. Become familiar with the layout of the communities. Obtain maps, if available. If there is no map available, develop one and indicate the location of the houses to be visited (if known). The map does not have to be drawn to scale; general sketches of the community identifying the neighborhoods and/or the survey blocks are sufficient.

### 2. Selection of participants

The *Caregiver Survey* is designed to collect data about children 0–23.9 months old. The selection criteria and total number of children to be surveyed will be determined in the sampling procedures outlined in Step 2 of this Module.

### 3. Materials

The following materials are required:

- Copies of the Caregiver Survey Form (Form I-3.1)
- Copies of the Consent Letter and Form (Form I-2.1)
- Map of the area (if available) indicating location of houses or blocks to be visited
- Pencils/pens
- Clipboard
- Identification card.

### 4. Personnel and time frame

The *Caregiver Survey* will be carried out at the beginning of the fieldwork activities and (if possible) combined with the *24-hour Dietary Recall and Anthropometry*.

All Field Workers will participate in the application of the *Caregiver Survey*.

## **5. Description and procedures**

The *Caregiver Survey* is divided into nine different sections, and each section contains a series of questions, most of which should be pre-coded (in some cases, where indicated on the form, the Supervisor will need to fill in the code for the survey participant's response). The responsibilities of the Field Worker include finding the answer based on the interviewee's response and circling the appropriate code. Some questions are "open-ended" (i.e., the respondent is not limited in the answer she can provide) while others have a limited number of responses (including "other"). In both cases, the space provided on the form should be used to record the caregiver's response, in her own words.

The *Caregiver Survey* will be administered to the caregiver at her home. If the caregiver is not available during the Initial Visit, follow procedures described in *Caregiver Survey Guide* (for Form I-3.1).

## **6. Analysis**

Data analysis will include the following:

- Creating frequency tables (lists of the number and percentage of answers for each category) for the categorical variables (variables for which only distinctive answers are possible, e.g., sex, which can only be masculine or feminine), using the **ProPAN** software program.
- Calculating the average and standard deviation for continuous variables (variables that can have multiple answers, e.g., age, which can range from 0 upward) using the **ProPAN** software.

### Caregiver Survey Guide (for Form I-3.1)

Throughout the *Caregiver Survey*, code 77 corresponds to “Other” and code 99 corresponds to “Does not know / remember / answer.”

It should be noted that the numbering of the questions is not consecutive from one section to another. These gaps in the numbering sequence allow for questions to be added to each survey section as needed without affecting the sequence of the core questions of the survey (which correspond to the **ProPAN** software program that analyzes the data).

[record child's code here]

#### Form header

The child's unique code should be written in the upper-right corner (see above) of **all pages of the survey**. This will help to identify the pages if they become unstapled.

Each Field Worker should have a list of four-digit codes assigned sequentially to each child that participates in the study. The list of codes should be provided by one of the Supervisors, who should verify that no codes are repeated. As children enter the study, their name and code should be noted on a master list kept by the Supervisor.

Upon arriving at the survey respondent household for the Initial Visit, the Field Worker should identify himself/herself, show his/her identification card, and read the text at the top of the first page of the *Caregiver Survey Form (Form I-3.1)*. He/she should then ask if there is a child under 24 months old living in the home (including children of household employees). If there is, conduct the survey. If there is not, go to another home.

If there is more than one child under 24 months old in the same household, choose the youngest to participate in the study. In the case of twins (0–23.9 months old), choose the one that was born last (i.e., the youngest) to participate in the study.

In cases where consent has been given and the primary caregiver is not present in the home but an adult relative (e.g., the child's grandmother or aunt) is present, ask only the questions in Sections I (Identification), VII (Family Information), and VIII (Housing). Ask about the most convenient time to find the primary caregiver at home and make an appointment for a Follow-up Visit. Return to the household up to two times more to interview the primary caregiver. The team may decide to make follow-up visits on weekends to increase the chance to interview mothers who work outside the house. If, by the third visit (the Final Visit), the primary caregiver is still not available, confer with the Supervisor to choose a new home to conduct the survey.

Request the caregiver's signed consent to participate in the survey, read the consent letter aloud, and if consent is given obtain the signature and provide the caregiver with a copy of the letter. Explain the objectives of the study clearly, emphasizing that the information the interviewees provide will be kept strictly confidential. The signed form should be kept in a file with the project documents.

<b>I. Identification</b>	
1. Date survey is conducted	Write the date the survey is conducted in the following order: day / month / year. The date can be filled in ahead of time. Add a zero before the date for the first nine days of the month (e.g., the 2 <sup>nd</sup> day of the month should be written as “02”). The month should also be written using two digits (starting with 01 for January and ending with 12 for December).
2. Field Worker’s code	Record the Field Worker’s code (assigned by the Supervisor) here.
3. Survey results	After the interview is concluded, select from among the following options: “01” = “Complete” (all sections of the form have been filled out) “02” = “Incomplete” Circle this code if the household has been visited at least <b>two times</b> and the caregiver was not available during either visit.
4. Child’s code	Write the child’s <b>unique</b> code here and at the top-right corner of each page.
5. Full address	Write the street name where the home is located. Be sure to write clearly. If the street address is not available, in the Observations section (at the end of the form), write a description of any specific signs or landmarks that will facilitate finding the home in case it is necessary to return for another visit.
6. Supervisor’s code	The Supervisor’s code should be written here.
7. Date form reviewed by Supervisor	Write the date the survey was reviewed in the following order: day / month / year. Add a zero before the date for the first nine days of the month (e.g., day 2 = “02”). The month should also be written using two digits (starting with 01 for January and ending with 12 for December).
<b>II. Introduction</b>	
10. What is your name?	Write the caregiver’s name clearly in the following order: paternal last name, maternal last name, and first name.
11. What is the child’s name?	Write the child’s name, clearly, in the following order: paternal last name, maternal last name, and first name.
12. What is your relation to [child’s name]?	If the respondent is the child’s primary caregiver, circle “01.” Circle “02” if the respondent is the father. Circle “77” if the respondent is of “Other” relation to the child, and provide a written description of the relationship.
13. Are you the primary caregiver of [child’s name]?	If the respondent is the child’s primary caregiver, circle code 01. If she is not, circle “02.”
<b>III. Screening</b>	
20. Could you please show me an immunization record or birth certificate with [child’s name]’s birthdate?	Ask for the child’s immunization records or birth certificate. If available, circle “01.” If records documenting the child’s date of birth are not available, circle “02.”
21. What is [child’s name]’s birth date? [If birth date is unknown, estimate a date by asking questions about proximity of the birth to local holidays or festivals.]	Write the date of birth in the following order: day / month / year. If no records are available to document the child’s date of birth, estimate it by asking about local holidays or festivals (e.g., Was the child born before, during, or after Ramadan? or Was the child born in the year when the local river flooded the village?) If the informant does not know the child’s age, and cannot show any documents indicating the date of birth, and the date of birth cannot be estimated by local holidays and events, stop the survey and inform the Supervisor.

22. How many months old is [child's name]?	Register the child's age in <b>decimal months completed</b> (e.g., "23.9 months). Based on the date of birth and the survey date, <b>verify</b> that the child is no more than 23.9 months old. If the child is 24 months or older, <b>stop the survey</b> .
23. Is [child's name] a boy or a girl?	Circle the code corresponding to the child's sex: "01" = Male (boy) and "02" = Female (girl)
<b>IV. Breastfeeding and complementary feeding</b>	
Now I am going to ask you some questions about your pregnancy, what you fed the baby in the first few days after he/she was born, and current breastfeeding and complementary feeding practices.	
30. During your pregnancy with [child's name], how many times did you visit a health center for a prenatal visit?	This question refers to the number of times the mother visited any health unit for a prenatal visit (to make sure the pregnancy was going well and have her blood pressure, height, and weight measured, and to have any questions answered). This question only refers to her pregnancy with this child. Write down the number of times using two digits (i.e., three visits should be written as "03"). If the mother did not go a health unit for at least one prenatal visit, write code 00. If she does not remember the number of visits, circle code 99.
31. Where did you give birth to [child's name]?	Circle the code corresponding to the place where the baby was delivered. If the answer is not listed, circle code 77 ("Other") and specify the place. If the respondent does not remember, circle code 99.
32. Did you ever breastfeed [child's name]?	If the child was ever breastfed (at least once), circle code 01. If, from birth to the time of the interview, the child has never been breastfed, circle code 02 and skip to Question 50. If the respondent does not remember or does not know the answer, circle code 99 and skip to Question 50.
33. How many hours after birth did you breastfeed [child's name] for the first time?	Write the code corresponding to the category. For example, if the mother breastfed the child 2.5 hours after birth, circle code 02 ("1–3 hours after birth"). If she does not know or remember the number of hours, circle code 99.
34. Did you feed colostrum to [child's name]?	Please clarify that this question specifically refers to the colostrum (breast milk produced the first few days after birth, which tends to be more yellow, more liquid, and less thick than mature breast milk). Circle code 01 if the respondent fed colostrum to the child and "02" if she did not. If she does not know or remember, circle code 99.
35. During the first 3 days after birth, was [child's name] given anything other than breast milk?	Circle code 01 if the answer is "Yes." If the answer is "No," circle "02" and skip to Question 37. If the answer is "Does not know," circle "99" and skip to Question 37.
36. What was [child's name] given?	Circle the code corresponding to the answer that is given. If the answer is not listed, circle code 77 ("Other") and describe what the child was given in the space provided.
37. During the first 3 days after the child was born did you receive any practical support or advice to help you start breastfeeding [child's name]?	This question will help determine if the mother received immediate post-natal counseling/support. Circle code 01 if the mother received support or advice during the first 3 days after giving birth. If she did not, circle code 02. If the respondent does not know or remember, circle code 99.
Now I have few questions about breastfeeding [child's name] since this time yesterday.	
38. Yesterday, did you breast-feed [child's name]?	Circle code 01 if the child was breastfed yesterday (within the past 24 hours). If the child was not breastfed yesterday, circle "02." If the respondent does not know, circle 99.

39. Yesterday, did [child's name] drink breast milk from a cup or a bottle?	Circle code 01 if the child received breast milk yesterday from any of the manners mentioned in the question. Then skip to Question 50. If the child did not receive breast milk in any of these ways, circle code 02. If the respondent does not know or remember, circle code 99.
40. Yesterday, did you breast-feed whenever [child's name] wanted or on a fixed schedule?	This question will help to determine if the child is being breastfed "on demand" (i.e., whenever the child wants, or following a fixed schedule). Circle the corresponding answer. If the respondent cannot or does not answer the question, circle code 99.
<i>Now I would like to ask about feeding solid or semi-solid foods to the child.</i>	
50. Who mainly decides what [child's name] should and should not eat?	Circle the code corresponding to the answer. If the answer is not mentioned in the first six options, circle code 77 ("Other") and specify who decides what the child should and should not eat. If this question is not applicable because the child does not eat solid foods yet, circle code 88 and skip to Question 53.
51. Generally speaking, how is the child's appetite when she/he is healthy?	Please note that this question refers to the child's appetite when she/he is healthy. Clarify with the respondent that "appetite" refers to the child's consumption of solid or semi-solid foods. To facilitate understanding of the question, read the options aloud.
52. At what age did you feed [child's name] her/his first solid/semi-solid food? By "solid or semi-solid foods," we mean food that is thick, not a soup, broth, or thin porridge.	Please note that this question refers to the first time the child received any solid or semi-solid food. Mention some examples (e.g., porridge, cereal, and mashed fruit) to the respondent and write down the answer that corresponds to the child's age (in decimal months completed) when he/she was first given any solid or semi-solid food. Please note that the liquid part of soups or broths is <b>not</b> considered a solid or semi-solid food. Soup with mashed vegetables is considered a semi-solid food. If the caregiver mentions soup, verify if the child ate the solid or semi-solid ingredients or only the broth. This question applies to foods that were given on a regular basis, and that were actually consumed (i.e., merely tasting the food does not count). If the child's age was less than 1 month, write code 00. If the respondent does not know or cannot remember, circle code 99.
<i>Now we are going to discuss the feeding of [child's name] since this time yesterday.</i>	
53. Are you the person who fed [child's name] yesterday?	Circle the code 01 if the respondent fed the child yesterday. If the respondent did not feed the child yesterday, circle "02" and skip to Question 67.
54. Yesterday, what liquids other than breast milk was [child's name] given?	Read all of the options and select all those that apply.
55. Yesterday, did [child's name] have anything to drink from a bottle with a nipple?	This question refers to whether or not the child was fed with a bottle with a nipple in the previous 24 hours. If the answer is "Yes," circle code 01. If the answer is "No," circle code 02. If the answer is "Does not know," circle code 99.
56. Yesterday, did [child's name] eat any solid or semi-solid foods?	Circle "01" if the child ate any solid or semi-solid food yesterday. Circle "02" if not. Circle "88" if this does not apply (child does not eat solid foods). Circle code 99 if the respondent does not know.
<i>Now I would like to ask some questions about how [child's name] was fed yesterday during the main meal.</i>	
60. Yesterday, at the main meal, did [child's name] eat all the food you thought he/she should?	Circle code 01 if the caregiver said that the child did eat all food that she thought he/she should. Circle code 02 if the caregiver thought that the child did not eat all that she thought she should at the meal. Circle code 99 if the respondent does not know.

<p>61. Yesterday, during the main meal, did you do anything to encourage [child's name] to eat?</p>	<p>If the respondent answered "02" to Question 60, that means the child refused food. The goal of this question is to determine if the caregiver did anything to encourage the child to eat.</p> <p>Circle code 01 if the caregiver said she did do something to encourage the child to eat.</p> <p>Circle code 02 if the respondent said she did not do anything to encourage the child to eat and skip to Question 63.</p>
<p>62. What did you do?</p>	<p>Ask the caregiver everything that she did to encourage the child to eat and write down all of the responses in the space provided. After each response, to ensure all information is captured about anything the respondent did to encourage the child to eat, ask the caregiver if she did anything else.</p> <p>Circle all codes that apply (multiple answers are ok).</p> <p>Circle code 01 if the caregiver offered another food or liquid to encourage the child to eat.</p> <p>Circle code 02 if the caregiver verbally encouraged the child to eat (e.g., saying something like "Try a little bit more," or "More will make you strong.")</p> <p>Circle "03" if the caregiver modeled eating (e.g., eating a spoonful herself or pretending to eat, or feeding a doll or toy).</p> <p>Circle code 04 if the caregiver gave strong commands or forced the child to eat (e.g., telling the child that he/she must finish, or holding the child's hands down or the child's head to force food into his/her mouth).</p> <p>Circle code 05 if another person helped the child to eat.</p> <p>Circle code 06 if another form of encouragement was used.</p> <p>Circle code 99 if the respondent does not know.</p>
<p>63. Yesterday, during the main meal while feeding [child's name], did you talk to her/him?</p>	<p>Circle code 01 if the respondent said she talked to the child during the previous day's meal.</p> <p>Circle code 02 if the respondent said she did not, and skip to Question 65.</p> <p>Circle code 99 if the respondent does not know, and skip to Question 65.</p>
<p>64. What did you say?</p>	<p>If the answer was code 01 in Question 63, ask the caregiver what she said to the child during the meal. Write all responses in the space provided. To ensure all information is captured about anything the caregiver said to the child, after each response, ask the caregiver whether she said anything else.</p> <p>Circle all codes that apply (multiple answers are ok).</p> <p>Circle code 01 if the caregiver commanded the child to eat (using words such as "Eat, eat," "Eat up," or "Finish your food").</p> <p>Circle code 02 if the caregiver praised the child (using words such as "Good girl/boy," or "How well you are eating!").</p> <p>Circle code 03 if the caregiver asked the child questions such as "Do you like this food?" "Would you like more?" or "Would you like a drink?"</p> <p>Circle code 04 if the caregiver talked about the food (saying things like "This is delicious," "This food will make you strong and healthy," or "See this orange carrot").</p> <p>Circle code 05 if the caregiver threatened the child (saying things like "If you don't eat this then I won't take you out," "I shall tell your father if you don't finish this," or "You are a naughty girl/boy if you don't finish your food").</p> <p>Circle code 06 if the caregiver told the child that she liked the food (e.g., "Yummy; I do like this").</p> <p>Circle code 07 if the caregiver promised the child a reward if he/she ate her food (e.g., "What a good boy; I'll give you a biscuit").</p> <p>Circle code 08 if the caregiver talked about other things (saying things like "This is a spoon," "Look at the picture on this plate," or "Your brother is feeding the animals").</p> <p>Circle code 99 if the respondent does not know.</p>

65. Yesterday, during the main meal, did [child's name] self-feed (eat by him/herself, using hands or utensil) at any moment during the meal?	Clarify with the caregiver that this question refers to whether the child self-fed (ate by herself/himself) using his/her hands or utensils, or was allowed to touch the food or the utensils at any time during the child's main meal the previous day. Circle code 01 if this occurred at any time during the meal. Circle code 02 if the child did not self-feed or touch the food or utensils at all during the meal. Circle code 99 if the respondent does not know.
66. Yesterday, during the main meal, did [child's name] self-feed the whole time, half of the time, or for a little time?	If the child self-fed or touched the food or utensils during the meal (code 01 in Question 65) ask the caregiver how long the child self-fed during the meal. Read the response choices aloud to the caregiver ("during the entire meal," "during half of the meal" or "for only a little time during the meal") and circle code 01, 02, or 03 according to the answer. Circle code 99 if the respondent does not know.
Now we are going to talk about the breast milk, liquids and foods you gave to [child's name] during the last time he/she was sick.	
67. The last time [child's name] was sick, did you offer less, more, or the same amount of breast milk as when [child's name] is healthy?	Circle the code ("01–04") that corresponds to the amount of <b>breast milk offered</b> to the child during the last illness. If less was offered, probe the reason(s) why and circle the proper code ("01" if it was the child's decision and "02" if it was the respondent's decision). Circle "05" if the child was never breastfed or was not breastfeeding at the time of his/her last illness. Circle "88" if the child had never been sick, and skip to Question 80. Circle "99" if the respondent does not remember.
68. The last time [child's name] was sick, did you offer less, more, or the same amount of non-breast milk liquids as when [child's name] is healthy?	Circle the code ("01"–"04") that corresponds to the amount of <b>non-breast milk liquids offered</b> to the child during the last illness. If less was offered, probe the reason(s) why and circle the choice that indicates if it was the child's decision ("01") or the caregiver's decision ("02"). Circle "88" if the child was only receiving breast milk. Circle "99" if the respondent does not remember.
69. The last time [child's name] was sick, did you offer less, more, or the same amount of foods as when [child's name] is healthy?	Circle the code ("01"–"04") that corresponds to the amount of <b>non-breast milk foods offered</b> to the child during the last illness. If less was offered, then probe the reason(s) why and circle the choice that indicates if it was the child's decision ("01") or the caregiver's decision ("02"). Circle "88" if the child was only receiving breast milk, and skip to Question 80. Circle "99" if the respondent does not remember.
70. After the illness ended, did you offer less, more, or the same amount of food as when [child's name] is healthy?	Circle the code ("01"–"04") that corresponds to the amount of <b>non-breast milk foods offered</b> to the child <b>after the last illness ended</b> . If less was offered, probe the reason(s) why and circle the choice that indicates if it was the child's decision ("01") or the caregiver's decision ("02"). Circle "99" if the respondent does not know.
<b>V. Health and other services</b>	
<b>Ask the caregiver to show an immunization card to document/simplify the response process.</b>	
80. In the last 3 months, since [month], have you taken [child's name] to a hospital, health center, mobile unit, or any other health service?	Please note that this question refers to the <b>last 3 months</b> . State the month when the three-month period started (e.g., "...since last December") to clarify the question. Read all health service options aloud. Circle the code corresponding to the health service where the child was taken. If the answer does not correspond to codes 01 through 05, circle code 77 ("Other") and specify the answer. If, during this period, the child was not taken to any health service (private or public), circle code 88. If the respondent does not know, circle code 99. If the child was taken to more than one health facility, record information only about the last visit.

81. In the last 3 months, at any of those places (the health facilities listed above), was [child's name] weighed or measured for either body length or mid-upper arm circumference?	<p>Please note that this question refers to the <b>last 3 months</b>. Read all measurement options aloud.</p> <p>If the child was weighed during this period, circle code 01. If he/she was not, circle code 02. Circle "99" if the respondent does not know.</p> <p>If the child's length was measured during this period, circle code 01. If he/she was not, circle code 02. Circle "99" if the respondent does not know.</p> <p>If the child's mid-upper arm circumference (MUAC) was measured during this period, circle "01." If it was not, circle code 02. Circle "99" if the respondent does not know.</p>
82. During the last 3 months, since [month], [child's name] ever take/receive any of the following?	<p>Please note that the question refers to the <b>last 3 months</b>. Tell the caregiver the month when the three-month period started. Only ask about products/services that can be accessed locally. If provided for the fieldwork, show the caregiver the product or a photo of the product that you are asking about.</p> <p>Check if there is any indication of the child having taken vitamin supplements on the immunization card, or if there is a doctor's prescription for any other type of vitamin and mineral supplement.</p> <p>Ask the caregiver if she has a card or any other documentation of participation in a feeding program, general food distribution, or cash assistance program.</p> <p>If the caregiver knows that the child took a supplement or syrup, but does not remember its specific content, circle code 01 ("Yes").</p>
83. During the last 6 months, since [first month of 6-month period] did [child's name] ever take a vitamin A capsule, supplement, or syrup?	<p>Please note that the question refers to the <b>last 6 months</b>. State the month when the six-month period started. It may be helpful to bring actual samples of the supplements, or photographs of them, to show to the caregivers.</p> <p>Check to see if there is any indication of the child having taken any vitamin A supplements on the immunization card, or if there is a doctor's prescription for any other type of vitamin and mineral supplement.</p> <p>If the caregiver knows the child took a supplement or syrup but does not remember its specific content, circle code 99 and check to see that code 01 ("Yes") in Question 82 was circled.</p>
<b>VI. Health communication</b>	
Now I would like to discuss where you receive messages about feeding children.	
90. In the last 3 months, did you [the respondent] hear or receive any messages or information on child feeding?	<p>This question refers to any messages the caregiver has heard or read in any type of media (e.g., radio, television, newspapers, or magazines) in the <b>last 3 months</b>. If the caregiver heard or read any messages during this period circle code 01 and continue to the next question.</p> <p>If the answer is "No," circle code 02 and skip to Question 93. If she cannot remember, circle code 99 and skip to Question 93.</p>
91. Where or from whom did you receive the messages?	<p>Do not read the answer options aloud. Circle all that apply.</p> <p>If the respondent's answer does not correspond to any of the options, circle "01" for "Other" and write the response in the space provided.</p> <p>Circle "99" if the respondent does not know or cannot remember.</p>
92. Do you remember what the message(s) said?	<p>If the respondent remembers the message(s), circle code 01 and write it down using the respondent's own words. Do not abbreviate or try to interpret the answer. If more space is needed, use the space provided in the Observations section at the bottom of this form, indicating the question number. Continue with the next question.</p> <p>If the respondent says she cannot remember, ask her to try again. If she still cannot recall the message(s), circle code 02.</p>

93. How often do you listen to the radio?	Circle the code that corresponds to the frequency with which the caregiver listens to the radio. Code 06 indicates that the caregiver “rarely or occasionally” listens to the radio (e.g., once every 2 months). If the answer does not correspond to the first six options, circle code 77 (“Other”) and specify the answer. Circle “99” if the respondent does not know.
94. Do you ever watch television?	If the respondent says she watches television at home or any other place, circle code 01 and continue to the next question. If she does not watch television, circle code 02 and skip to Question 100.
95. Do you participate in any community organizations or social programs?	Mention examples (e.g., community kitchens, parent associations, credit associations, health committees, etc.) Circle “01” if the caregiver participates in such organizations. Circle “02” if she does not, and skip to Question 100. Circle “99” if she does not know, and skip to Question 100.
96. Specify which organizations or programs in which you participate.	Write down the name(s) of any organizations or programs mentioned by the respondent.
<b>VII. Family information</b>	
Now I will ask you some questions regarding this family and home.	
100. How many people live in the home, including you [the respondent], any young children, and the elderly?	Write the number of family members who live in the same home and share the same expenses, expressed as two digits (i.e., five family members = “05”). Remind the respondent to include young children as well as the elderly.
101. How many of them are under 5 years old?	Count only the children <b>under 5 years old</b> who live in the home. Record as two digits (i.e., two children under 5 = “05”). If they have already turned 5 years old, do not count them.
102. How old are you?	Ask the respondent her age and write down the number.
103. Are you [single, married, living with a partner, separated, widowed, or divorced]?	Ask the respondent if she is single, married, living with a partner, separated, widowed, or divorced, and circle the corresponding code. If the respondent does not know or does not want to respond, circle code 99.
104. Do you know how to read and write?	This question refers to the respondent. If she knows how to read and write, circle code 01. If the respondent says “Yes,” ask her to read a sentence in the local/national language. If she does not know how to read or write, circle code 02.
105. What is the highest [grade/form/year] of school that you completed?	Write the highest grade/form/year the respondent completed, expressed as two digits (e.g., grade 9 should be written as “grade 09”). If she does not remember, circle code 99. If she received no formal education, circle code 00. If she knows how to read but cannot write, or vice versa (knows how to write but cannot read), circle code 03. If she is blind or visually impaired, circle code 04.
106. In your household, who usually makes decisions about purchasing food or taking [child’s name] to health services?	If the respondent is the main decision-maker for household purchases, circle code 01. Circle code 02 if the main decision-maker is the husband/partner. Circle code 03 if it is both the respondent and the spouse/partner. Circle code 04 if it is an elderly person in the household. Circle code 05 if it is the both the respondent and an elderly person in the household. Circle code 77 (“Other”) if it is some other person not listed in the answer options and specify the relationship of that person to the child. Circle code 06 if it is both the respondent and the unlisted person. Circle code 99 if the respondent does not know.

107. <i>In which stores or markets do you buy food?</i>	This information will help to identify the places where community caregivers most frequently buy food. Write the name of the store(s) and/or market(s) and their approximate location.
<i>Now I would like to discuss any employment you may have.</i>	
108. <i>Aside from your own housework, have you [the respondent] done any paid work in the last seven days?</i>	This question refers to any activity through which the caregiver earns money (e.g., washing clothes for others, doing agricultural wage labor, selling food, etc.). If “Yes,” circle code 01. If no, circle code 02 and skip to Question 110. If the caregiver seems uncomfortable answering this question, try to clarify that neither the amount nor the frequency of her work are important. If she does not want to answer, circle code 99 and skip to Question 110.
109. <i>If “Yes,” what is your occupation—that is, what kind of work do you mainly do?</i>	Circle the one that best applies. If the occupation is not listed, circle code 77 and describe it.
110. <i>Does anyone in your household grow food? If “Yes,” tell me all about the types of food that are grown.</i>	Circle all options that apply.
111. <i>Does this household own livestock, other farm animals, poultry, or fish? If “Yes,” tell me all about the types of animals that you have.</i>	Circle all options that apply.
<b>VIII. Housing</b>	
<i>Now I would like to talk about your home.</i>	
120. <i>What is the main source of drinking water for members of your household?</i>	This question refers to the main source of drinking water used throughout <b>most of the year</b> . Select one. If water is piped into the dwelling (code 01), skip to Question 122.
121. <i>How long does it take to go there, get water, and come back?</i>	Write down the number of minutes required to obtain water. Circle “99” if the respondent does not know.
122. <i>Do you [the respondent] do anything to the water to make it safer to drink?</i>	Circle “01” if the caregiver treats the water. Circle “02” if she does not, and skip to Question 124. Circle “99” if the respondent does not know, and skip to Question 124.
123. <i>What do you usually do to make the water safer to drink?</i>	Probe further after each response (i.e., ask “Anything else?”). Write down all responses mentioned.
124. <i>What kind of toilet facility do members of your household usually use?</i>	Circle one response. If the toilet facility is not listed, circle code 77 and describe. If the respondent does not know, circle code 99.
125. <i>What type of fuel does your household mainly use for cooking?</i>	Circle one response. If a fuel not listed is mentioned, circle code 77 (“Other”) and write down the name of the fuel. Circle code 99 if the respondent does not know.

<p>126. Does your household have [list the items described in the right hand column]?</p>	<p>Circle the corresponding code:  A) If, during the interview, a light bulb or electronic item is observed (turned on), this question can be skipped after circling code 01. If the home does not have electricity, circle code 02.  B) If there is a radio (or more than one) in the home, even if it does not belong to the respondent, circle code 01. If there is no radio in the home, circle code 02.  C) If there is a television (or more than one) in the home, even if it does not belong to the respondent, circle code 01. If there is no television in the home, circle code 02.  D) If there is a phone (landline or mobile) in the home, circle code 01. If there is no phone in the home, circle code 02.  E) If there is a refrigerator (or more than one) in the home, even if it does not belong to the respondent, circle code 01. If there is no refrigerator in the home, circle code 02.</p>
<p><b>IX. HIV/AIDS and child feeding</b></p>	
<p>Now I would like to talk about AIDS.</p>	
<p>130. Have you [the respondent] ever heard of an illness called AIDS?</p>	<p>If the respondent has heard of AIDS, circle code 01.  If the respondent has not heard of AIDS, circle code 02, and skip to the end of the survey.</p>
<p>131. Can the virus that causes AIDS be transmitted from a mother to her baby:  –during pregnancy?  –during delivery?  –by breastfeeding?</p>	<p>Read the three options aloud to the respondent. Multiple answers are possible, so circle any codes that apply. Circle code 01 for “Yes,” code 02 for “No,” or code 99 for “Does not know” for each of the three options. If the respondent mentions a means/time of transmission that is not listed, circle “01” for “Other” and write it down. If the respondent does not know the answer to this question, circle “99.”</p>
<p>132. Are there any special drugs that a doctor or a nurse can give to a woman infected with the AIDS virus to reduce the risk of transmission to the baby?</p>	<p>Circle “01” for “Yes” or “02” for “No.”  If the respondent does not know the answer to this question, circle “99.”</p>
<p>133. Have you learned about ways to prevent passing the AIDS virus from mother to child during breastfeeding?</p>	<p>Circle “01” for “Yes” or “02” for “No.”</p>
<p>134. How did you learn about ways to prevent passing HIV from mother to child during breastfeeding?</p>	<p>Do not read the list of possible responses aloud. Multiple answers are ok, so circle any codes that apply.  If the respondent mentions any people/sources that are not listed, circle code 01 (“Other”) and write down the answer. If the source is a person, including his/her relation to the respondent. If the respondent does not know the answer to this question, circle code 01 for “Does not know.”</p>
<p>135. Were you tested for the AIDS virus during your pregnancy with [child’s name]?</p>	<p>Circle code 01 if the answer is “Yes.”  Circle code 02 if the answer is “No.”  Circle code 99 if the answer is “Does not know.”</p>
<p><b>End of survey</b></p>	
<p>Thank the respondent for participating in the survey, and if she has a child that is 6.0–23.9 months old, ask if she is willing to answer some questions about what the child ate yesterday (using the 24-hour Dietary Recall and Anthropometry). If she says that it is not a convenient time to answer questions, ask when would be a better time for you to come back and ask the questions.</p>	
<p><b>Observations</b></p>	
<p>Use this space to clarify or facilitate the interpretation of any responses written out or coded above. Be sure to include the relevant question number. This space may also be used to describe any factors that may have impeded the proper administration of the survey.</p>	

### Caregiver Survey Form (Form I-3.1)

Good morning/afternoon, my name is \_\_\_\_\_ and I'm working for the \_\_\_\_\_ in an infant and child feeding project. Could you please tell me if there are any children less than 2 years of age living in this home? (IF THERE ARE NO CHILDREN LESS THAN 2 YEARS OF AGE, THANK THE PERSON AND CONTINUE ON TO THE NEXT HOME.)

Could you please confirm that you are the mother of a child less than 2 years of age? (If THE CHILD'S MOTHER IS NOT PRESENT, STOP THE SURVEY AND RETURN TO THE HOME, UP TO 2 TIMES AT A LATER DATE. If the mother is no longer present in the child's life, interview the main caregiver.)

Could I ask you some questions regarding the feeding of the child less than 2 years of age living in the home? The information that you provide will be 100% confidential. (READ THE CONSENT LETTER, HAVE IT SIGNED AND GIVE THE PERSON A COPY.)

I. IDENTIFICATION	
1. Date survey is applied	Date.....__ / __ / __ day month year
2. Field Worker's code	Code.....__
3. Survey results	Complete.....01 Incomplete.....02 Dates of follow up visits: Visit 1.....__ / __ / __ day month year Visit 2.....__ / __ / __ day month year
4. Child's code	Code.....__
5. Full Address WRITE THE DISTRICT, UNION, VILLAGE, STREET, AVENUE, KILOMETER, NEIGHBOR- HOOD, ETC.)	_____ _____ _____
6. Supervisor's code	Code.....__
7. Date reviewed by supervisor	Date.....__ / __ / __ day month year

II. INTRODUCTION		
10. What is your name?	_____	
11. What is the [child's name]?	_____	
12. What is your relation to [child's name]?	Mother ..... 01 Father ..... 02 Other, specify: _____ 77	
13. Are you the primary caregiver of [child's name]?	Yes..... 01 No ..... 02	
(IF THE CHILD HAS ALREADY HAD HER/HIS 24 MONTH BIRTHDAY, STOP THE SURVEY.)		



37. During the first 3 days after birth, were you offered any practical support or advice to help you start breastfeeding [child's name]?	Yes.....01 No .....02 Does not know .....99	
<i>Now I have few questions about breastfeeding [child's name] since this time yesterday.</i>		
38. Yesterday, was [child's name] breastfed?	Yes.....01 No .....02 Does not know .....99	
39. Yesterday, did [child's name] drink breastmilk from a cup or a bottle?	Yes.....01 No .....02 Does not know .....99	01->50
40. Yesterday, was [child's name] breastfed whenever he/she wanted or on a fixed schedule?	Whenever the child wanted .....01 On a fixed schedule .....02 Does not know .....99	
<i>Now I would like to ask about feeding solid or semi-solid foods to the child.</i>		
50. Who mainly decides what [child's name] should and should not eat?	The mother .....01 A grandparent .....02 A sibling.....03 An aunt/uncle .....04 A neighbor/friend .....05 The father .....06 Other, specify: .....77 Does not apply (child does not eat solid foods).....88	
51. Generally speaking, how is [child's name]'s appetite when she/he is healthy? (READ FIRST THREE OPTIONS)	Eats too much .....01 Eats well .....02 Eats a little .....03 Does not know .....99	
52. At what age was [child's name] fed his/her first solid/semi-solid food? By solid or semi-solid foods we mean food that is thick, not a soup, broth or thin porridge.	Age in months ..... Less than 1 month .....00 Does not know .....99	
<i>Now we are going to discuss the feeding of [child's name] since this time yesterday.</i>		
53. Are you the person who fed [child's name] yesterday?	Yes.....01 No .....02	02-> 67
54. Yesterday, what liquids other than breastmilk was [child's name] given? (READ ALL OPTIONS)	None .....01 Tea .....02 Water (includes sugar water) .....03 Infant formula .....04 Other non-breastmilk milks .....05 Other, specify: .....77 Does not know .....99	
55. Yesterday, did [child's name] have anything to drink from a bottle with a nipple?	Yes.....01 No .....02 Does not know .....99	

56. Yesterday, did [child's name] eat any solid or semi-solid foods?	Yes .....01 No .....02 Does not apply (child does not eat solid foods).....88 Does not know .....99	02->67  88->67 99->67
Now I would like to ask some questions about how [child's name] was fed yesterday during the main meal.		
60. Yesterday, at the main meal, did [child's name] eat all the food you thought he/she should?	Yes .....01 No .....02 Does not know .....99	
61. Yesterday, during the main meal, did you do anything to encourage [child's name] to eat?	Yes .....01 No .....02	02-> 63
62. What did you do? (Write down the caregiver's answer and code it later. Multiple responses are acceptable. Circle all codes that apply.)	Offered another food or liquid .....01 Encouraged verbally.....02 Modeled eating (with or without toy).....03 Ordered strongly or forced the child to eat04 Another person helped feed child.....05 Another form of encouragement .....06 Does not know .....99	
63. Yesterday, during the main meal while feeding [child's name], did you talk to her/ him?	Yes .....01 No .....02 Does not know .....99	02-> 65 99-> 65
64. What did you say? (Write down the caregiver's answer and code it later. Multiple responses are acceptable. Circle all codes that apply.) _____ _____ _____ _____	Ordered child to eat .....01 Praised child.....02 Asked child questions .....03 Talked about the food .....04 Threatened the child .....05 Told child that she liked the food.....06 Rewarded the child.....07 Talked about other things .....08 Does not know .....99	
65. Yesterday, during the main meal, did [child's name] self-feed (eat by him/herself, using hands or utensil) at any moment during the meal?	Yes .....01 No .....02 Does not know .....99	02-> 67 99->67
66. Yesterday, during the main meal, did [child's name] self-feed the whole time, half of the time, or for a little time?	All of the time .....01 Half of the time.....02 Little bit of time .....03 Does not know .....99	
Now we are going to talk about the breast milk, liquids and foods you gave to [child's name] during the last time he/she was sick.		
67. The last time [child's name] was sick, did you offer less, more or the same amount of breast milk as when [child's name] is healthy? (If response is "less", ask additional questions to determine why.)	Less, because the child did not want it .....01 Less, because mother's decision.....02 More .....03 The same .....04 Child never breastfed or child breastfeeding before last illness .....05 Child has never been sick.....88 Does not know .....99	88->80

68. The last time [child's name] was sick, did you offer less, more or the same amount of non-breast milk liquids as when [child's name] is healthy? (If response is "less", ask additional questions to determine why.)	Less, because the child did not want it .....01 Less, because mother's decision.....02 More .....03 The same .....04 Child never fed non-breast milk liquids ..88 Does not know .....99																	
69. The last time [child's name] was sick, did you offer less, more or the same amount of foods as when [child's name] is healthy? IF THEY RESPOND "LESS" THEN PROBE "WHY?")	Less, because the child did not want it .....01 Less, because mother's decision.....02 More .....03 The same .....04 Child never fed foods.....88 Does not know .....99	88->80																
70. After the illness ended, did you offer less, more or the same amount of food as when [child's name] is healthy? (If response is "less", ask additional questions to determine why.)	Less, because the child did not want it .....01 Less, because mother's decision.....02 More .....03 The same .....04 Does not know .....99																	
V. HEALTH AND OTHER SERVICES																		
Now I would like to discuss [child's name]'s visits to health facilities in the last 3 months.																		
80. In the past 3 months, since _____ (MONTH), have you taken [child's name] to a hospital, health center, mobile unit, or any other health service? (READ ALL OPTIONS)	Hospital.....01 Health center, clinic.....02 Community health post.....03 Mobile unit.....04 Doctor's office .....05 Other, specify _____77 Has not taken child .....88 Does not know .....99	88->82 99->82																
81. In the past 3 months, at any of these places (health facilities), was [child's name] measured for: (READ ALL OPTIONS)	<table><tr><td></td><td>Yes</td><td>No</td><td>Does not know</td></tr><tr><td>Weight</td><td>01</td><td>02</td><td>99</td></tr><tr><td>Length</td><td>01</td><td>02</td><td>99</td></tr><tr><td>Upper arm</td><td>01</td><td>02</td><td>99</td></tr></table>		Yes	No	Does not know	Weight	01	02	99	Length	01	02	99	Upper arm	01	02	99	
	Yes	No	Does not know															
Weight	01	02	99															
Length	01	02	99															
Upper arm	01	02	99															
Next I have a few questions about vitamin and mineral supplements and other nutrition products.\																		

<p>82. During the past 3 months, since _____ (MONTH), did [child's name] ever take/receive any of the following? [ONLY include PRODUCTS/SERVICES LOCALLY PROVIDED. IF PROVIDED locally, SHOW THE MOTHER/CARE-GIVER THE PRODUCT YOU ARE ASKING ABOUT.]</p>	<table border="1"> <thead> <tr> <th></th> <th>Yes</th> <th>No</th> <th>Does not know</th> </tr> </thead> <tbody> <tr> <td>Iron supplement or syrup? (For example, ferrous sulfate)</td> <td>01</td> <td>02</td> <td>99</td> </tr> <tr> <td>A multi-vitamin and mineral supplement, syrup or powder (such as Sprinkles)?</td> <td>01</td> <td>02</td> <td>99</td> </tr> <tr> <td>Lipid nutrient supplement, (such as Nutributter or Plumpydoz or [LOCAL NAME/PRODUCT])?</td> <td>01</td> <td>02</td> <td>99</td> </tr> <tr> <td>Supplementary food, (such as Corn Soya Blend or [LOCAL NAME/PRODUCT])</td> <td>01</td> <td>02</td> <td>99</td> </tr> <tr> <td>General food rations</td> <td>01</td> <td>02</td> <td>99</td> </tr> <tr> <td>Vouchers for food</td> <td>01</td> <td>02</td> <td>99</td> </tr> <tr> <td>Cash assistance to help purchase food [USE LOCAL PROGRAM NAME]</td> <td>01</td> <td>02</td> <td>99</td> </tr> </tbody> </table>		Yes	No	Does not know	Iron supplement or syrup? (For example, ferrous sulfate)	01	02	99	A multi-vitamin and mineral supplement, syrup or powder (such as Sprinkles)?	01	02	99	Lipid nutrient supplement, (such as Nutributter or Plumpydoz or [LOCAL NAME/PRODUCT])?	01	02	99	Supplementary food, (such as Corn Soya Blend or [LOCAL NAME/PRODUCT])	01	02	99	General food rations	01	02	99	Vouchers for food	01	02	99	Cash assistance to help purchase food [USE LOCAL PROGRAM NAME]	01	02	99	
	Yes	No	Does not know																															
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Cash assistance to help purchase food [USE LOCAL PROGRAM NAME]	01	02	99																															
<p>83. During the past 6 months, since _____ (month), did [child's name] ever take a vitamin A capsule, supplement or syrup?</p>	<p>Yes .....01 No .....02 Does not know .....99</p>																																	
<p><b>VI. HEALTH COMMUNICATION</b></p>																																		
<p>Now, I would like to discuss where you receive messages about feeding children.</p>																																		
<p>90. In the past 3 months, did you hear or receive any messages or information on child feeding?</p>	<p>Yes .....01 No .....02 Does not know .....99</p>	<p>02-&gt;93 99-&gt;93</p>																																

<p>91. Where or from whom did you receive the messages? (Do not read list aloud. Multiple answers are acceptable. Choose all that apply.)</p>	<p style="text-align: right;">Yes</p> <p>01 - Health facility 01</p> <p>02 - Community health worker 01</p> <p>03 - Traditional health providers 01</p> <p>04 - Family member 01</p> <p>05 - Neighbor/friend 01</p> <p>06 - Child who attends school 01</p> <p>07 - Community gathering 01</p> <p>08 - Radio 01</p> <p>09 - Television 01</p> <p>10 - Internet 01</p> <p>11 - Mobile phone messaging 01</p> <p>12 - Printed materials 01</p> <p>13 - Religious institution 01</p> <p>14 - Mother-to-mother group 01</p> <p>77 - Other, specify 01</p> <p>_____ 01</p> <p>99 - Does not know/remember 01</p>	
<p>92. Do you remember what the message(s) said? (IF THE MOTHER/ CAREGIVER ANSWERS NO, ASK HER TO TRY TO REMEMBER, REPEAT THE QUESTION AND WAIT FOR A REASONABLE AMOUNT OF TIME)</p>	<p>Yes.....01</p> <p>Please describe: _____</p> <p>_____</p> <p>_____</p> <p>No .....02</p>	
<p>93. How often do you listen to the radio?</p>	<p>Daily (7 days a week) .....01</p> <p>2 to 6 days a week .....02</p> <p>Once a week .....03</p> <p>Once every 2 weeks .....04</p> <p>Once a month .....05</p> <p>Rarely .....06</p> <p>Other, specify 77</p> <p>Does not know .....99</p>	
<p>94. Do you ever watch television?</p>	<p>Yes.....01</p> <p>No .....02</p>	
<p>95. Do you participate in any community organizations or social programs? (MENTION EXAMPLES SUCH AS COMMUNITY KITCHENS, PARENT ASSOCIATIONS, CREDIT ASSOCIATIONS, HEALTH COMMITTEES, ETC.)</p>	<p>Yes.....01</p> <p>No .....02</p> <p>Does not know .....99</p>	<p>02-&gt;100</p> <p>99-&gt;100</p>
<p>96. In which organizations or programs do you participate? (WRITE DOWN ANY ORGANIZATIONS AND PROGRAMS that are mentioned.)</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	

VII. FAMILY INFORMATION		
Now, I will ask you some questions regarding this family and home.		
100. How many people live in the home? (Clarify that the respondent should include herself, any other adults, including the elderly, and all children. Record the number in column B.)	Number.....__ __	
101. How many of them are under five years of age? (Record the number in next column)	Number.....__ __	
102. How old are you?	Age.....__ __ Does not know .....99	
103. Are you (the mother/caregiver).....? (READ THE FIRST THREE OPTIONS aloud.)	Single.....01 Married/have a partner.....02 Separated/divorced/widowed .....03 Does not know .....99	
104. Do you know how to read and write? [IF THE RESPONDENT SAYS "YES", ASK HER TO READ A SENTENCE IN LOCAL/NATIONAL LANGUAGE]	Yes (able to read whole sentence .....01 No (cannot read at all.....02 Able to read only parts of sentence .....03 Blind/visually impaired .....04	
105. What is the highest grade/form/year of school that you completed?	Grade/form/year.....__ __ Did not study .....00 Does not know .....99	
106. In your household, who usually makes decisions about purchasing food or taking CHILD'S NAME to health services?	Mother/caregiver .....01 Husband/partner or other man in the household.....02 Mother/caregiver and father together.....03 Elder person in household/family (e.g. the grandparent of the child .....04 Mother/caregiver together with the elder person .....05 Other person, specify .....77 Mother/caregiver together with this other person.....06 Does not know .....99	
107. In what store or markets do you buy food? (WRITE THE NAME AND APPROXIMATE LOCATION)	_____ _____ _____ _____	
Now, I would like to discuss any employment you may have.		
108. Aside from your own house-work, have you done any paid work in the last seven days?	Yes.....01 No .....02 Does not know .....99	02->110 99->110

109. If yes, what is your occupation, that is, what kind of work do you mainly do?	Vendor.....01 Agricultural worker.....02 Office worker.....03 Service worker .....04 Education/research.....05 Healthcare.....06 Other, specify.....77	
110. Does anyone in your household grow food? If yes, tell me about all the types of food that are grown. (CHECK ALL THAT APPLY)	Yes (grains, roots, tubers) .....01 Yes (legumes, nuts) .....02 Yes (orange or yellow fruits & vegetables) ..03 Yes (green leafy vegetables) .....04 Yes (any other fruits & vegetables) .....05 Yes (other: specify.....) ....77 No .....07 Does not know .....99	
111. Does this household own livestock, herds, other farm animals, poultry or fish? If yes, tell me about all the types of animals that you have. (CHECK ALL THAT APPLY)	Yes (chickens, ducks, or other birds: for the meat) .....01 Yes (chickens, ducks, or other birds: for the eggs) .....02 Yes (cows, goats, sheep, pigs, camels or other large mammals for the meat) .....03 Yes (cows, goats, sheep, or camels for the milk) .....04 Yes (rabbits, guinea pigs, or other small mammals) .....05 Yes (fish).....06 No .....07 Does not know .....99	
<b>VIII. HOUSING</b>		
Now I would like to talk about your home.		
120. What is the main source of drinking water for members of your household?	Piped water Piped into dwelling .....01 Piped into compound, yard or plot.....02 Piped to neighbor .....03 Public tap / standpipe .....04 Tube well, Borehole .....05 Dug well Protected well.....06 Unprotected well.....07 Water from spring Protected spring.....08 Unprotected spring.....09 Rainwater collection.....10 Tanker-truck .....11 Cart with small tank / drum .....12 Surface water (river, stream, dam, lake, pond, canal, irrigation channel) .....13 Bottled water .....14 Other, specify:.....77 Does not know .....99	01->122

121. How long does it take to go there, get water and come back?	Number of minutes ..... Does not know .....99																			
122. Do you do anything to the water to make it safer to drink?	Yes .....01 No .....02 Does not know .....99	02->124 99->124																		
123. What do you usually do to make the water safer to drink? (PROBE WITH QUESTIONS LIKE: "ANYTHING ELSE"? RECORD EVERYTHING THAT IS MENTIONED.)	Boil .....01 Add bleach / chlorine.....02 Strain it through a cloth.....03 Use water filter (ceramic, sand, composite, etc.) .....04 Solar disinfection.....05 Let it stand and settle .....06 Other, specify:.....77 Does not know .....99																			
124. What kind of toilet facility do members of your household usually use?	Flush / Pour flush Flush to piped sewer system .....01 Flush to septic tank .....02 Flush to pit (latrine) .....03 Flush to somewhere else .....04 Flush to unknown place / Not sure / Does not know where .....05 Pit latrine Ventilated Improved Pit latrine (VIP) .....06 Pit latrine with slab.....07 Pit latrine without slab / Open pit.....08 Composting toilet.....09 Bucket .....10 Hanging toilet, Hanging latrine.....11 No facility, bush, field.....12 Other, specify:.....77 Does not know .....99																			
125. What type of fuel does your household mainly use for cooking?	Electricity.....01 Liquefied Petroleum Gas (LPG) .....02 Natural gas.....03 Biogas .....04 Kerosene .....05 Coal / Lignite .....06 Charcoal.....07 Wood .....08 Straw / shrubs / grass .....09 Animal dung .....10 Agricultural crop residue .....11 No food cooked in household.....12 Other, specify:.....77																			
126. Does your household have:	<table> <tr> <td></td><td>Yes</td><td>No</td></tr> <tr> <td>A) Electricity</td><td>01</td><td>02</td></tr> <tr> <td>B) Radio</td><td>01</td><td>02</td></tr> <tr> <td>C) Television</td><td>01</td><td>02</td></tr> <tr> <td>D) Phone (landline or mobile)</td><td>01</td><td>02</td></tr> <tr> <td>E) Refrigerator</td><td>01</td><td>02</td></tr> </table>		Yes	No	A) Electricity	01	02	B) Radio	01	02	C) Television	01	02	D) Phone (landline or mobile)	01	02	E) Refrigerator	01	02	
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C) Television	01	02																		
D) Phone (landline or mobile)	01	02																		
E) Refrigerator	01	02																		

IX. HIV/AIDS AND CHILD FEEDING			
Now I would like to talk about AIDS.			
130. Have you ever heard of an illness called AIDS?	Yes.....01 No .....02	02-> end of survey	
131. Can the virus that causes AIDS be transmitted from a mother to her baby:	Yes      No      Does not know		
During pregnancy?	01      02      99		
During delivery?	01      02      99		
By breastfeeding?	01      02      99		
By breastfeeding?	Other, specify _____ 01      02      99		
132. Are there any special drugs that a doctor or a nurse can give to a woman infected with the AIDS virus to reduce the risk of transmission to the baby?	Yes.....01 No .....02 Does not know .....99 .....		
133. Have you learned about ways to prevent passing the AIDS virus from mother to child during breast-feeding?	Yes.....01 No .....02		
134. How did you learn about ways to prevent passing the AIDS virus from mother to child during breast-feeding? (DO NOT READ OUT THE LIST) (MULTIPLE ANSWERS ARE ACCEPTED., CIRCLE ALL CODES THAT APPLY.)	Yes 01 - Health personnel (doctor, nurse, midwife) .....01 02 - Community health worker, peer counselor .....01 03 - Traditional health provider (healer, TBA) .....01 04 - Family member .....01 05 - Neighbor/friend .....01 77 - Other, specify _____ .....01 99 - Does not know .....01		
135. Were you tested for the AIDS virus during your pregnancy with CHILD'S NAME?	Yes.....01 No .....02 Does not know .....99		
<p>(Thank the mother/caregiver. If her child is 6.0 Month or older, ask her if it would be ok to continue the interview with some questions about what the child ate yesterday (i.E., Administer the 24-hour Dietary Recall and Anthropometry).</p> <p>If not, ask if it would be possible to return another day at a more convenient time. If she agrees, ask what would be the most convenient day and time, and write in observations below.</p> <p>If you have any observations (e.G., How to locate the home, or some extra information about any of the answers given by the respondent, write them in the space below.)</p>			
170. Observations	<hr/> <hr/> <hr/>		

## Annex I-4: 24-hour Dietary Recall and Anthropometry

### Objectives

- Identify current complementary feeding practices
- Compare current complementary feeding practices with the ideal practices defined in Table 1 in the Introduction, and determine the adequacy of caregivers' current practices
- Determine the adequacy of energy, protein, iron, zinc, vitamin A, vitamin C, and calcium intake
- Identify other complementary feeding practices that affect macro- and/or micronutrient intake
- Obtain information that will be used to develop the Key Foods List
- Generate data inputs for WHO's Optifood software program
- Assess children's nutritional status (if anthropometric data is collected)

The *24-hour Dietary Recall and Anthropometry* targets children 6.0–23.9 months old. In some situations, the research team may want anthropometric data for infants under 6 months old. In this case, anthropometric measurements can be taken for the children whose feeding practices are reported in the *Caregiver Survey* (which targets children 0–23.9 months old) instead of the *24-hour Dietary Recall and Anthropometry*.

### Products

- Percentage of infants
  - Exclusively breastfed in the previous 24-hour period
  - Predominantly breastfed
  - Breastfed according to age-specific recommendations
- Percentage of children
  - meeting their energy and nutrient requirements
  - consuming foods with recommended nutrient and energy density
  - consuming a diet with recommended nutrient and energy density
  - with minimum meal frequency
  - with minimum dietary diversity
  - consuming minimum acceptable diet
  - consuming iron-rich or iron-fortified food
  - with malnutrition (indicators of undernutrition and overweight and obesity)
- Percentage of non-breastfed children consuming non-human milk
- Sample's socio-demographic and morbidity profile

- Inputs for development of Key Foods List
- Inputs for WHO's *Optifood* software program

## Steps

### 1. Preparation and planning

Before starting the training, find out if the information listed below is available for either the country or the target population. Inquire at schools of nutrition and the entity that maintains the country's food composition table.

- Edible portions of foods (Form I-4.2)
- Cooked-to-raw conversion factors (Form I-4.3)
- Weights and measurements of foods (Form I-4.4)
- Abbreviations of household measurements (Form I-4.5)
- Liquid densities for converting volumes to weight (Form I-4.6)

If this information is not available, the research team will need to compile it for the most common foods in the study area. Examples of the information listed above and instructions on how to develop these types of lists are shown in the forms cited above, which can be found in this Annex. Tips for becoming familiar with local foods and their measurements are available in Instructions for familiarization with local foods and dishes at the end of this Annex.

### 2. Selection of participants

Unlike the *Caregiver Survey*, the *24-hour Dietary Recall and Anthropometry* is designed for caregivers of children 6.0–23.9 months old. Follow the sampling procedures outlined in Step 2 of this Module to identify the total number of caregivers to be surveyed and how they will be identified.

If the sample comprises the same respondents that participated in the *Caregiver Survey*, additional children 6–23.9 months old should be surveyed. The form should be applied to whoever fed the child the previous day (the child's primary caregiver).

### 3. Materials

Materials required for the home visits:

- Copies of the 24-hour Dietary Recall and Anthropometry Form (Form I-4.1). Writing on the forms will be easier if they are printed on larger-size paper (e.g., legal size).
- Copies of the Consent Letter and Form (Form I-2.1)
- Food scale with a capacity up to 2 kg and a minimum precision of 1 g
- Measuring cups (for liquid and dry ingredients)
- Samples of spoons, utensils, and other food containers used in households in the study area (e.g., cans, bags, and bottles)

- Visual aids for helping caregivers estimate portion sizes (these can be photos or drawings) or models of local food sizes and portions
- Map of the area (if available), indicating the location of the houses or blocks to be visited
- Pencils/pens
- Clipboard
- Identification cards for staff

Materials required for measuring children to obtain anthropometric data:

- Body-weight scales with precision of 100 g (preferably digital balances)
- Height/length measuring boards with precision of 1 mm
- Mid-upper arm circumference (MUAC) measuring tapes with precision of 1 mm

Materials required for calculating raw (versus cooked) grams of food consumed (see Office Work phase):

- Calculator
- *Edible portions of foods.* The edible portion of foods is the percentage of the food that is consumed. For example, only 67% of an apple is edible, as the core is not eaten.
- *Cooked-to-raw conversion factors.* When the interviewee gives information about the consumption of cooked foods and it is not possible to obtain a raw amount, the conversion factor should be used to calculate the raw grams of food consumed.
- *Measurements and weights of foods.* This refers to the most common foods in the country or target population. This information is generated by weighing different sizes of foods available in the community and should only be used when it is not possible to weigh a similar food (or preparation, or its ingredients) during the home visit portion of the *24-hour Dietary Recall and Anthropometry*.
- *Abbreviations of household measurements.* This information helps identify utensils the caregiver uses to offer foods or dishes to the child. All Field Workers should use the same abbreviations for each utensil. The list should be generated for the utensils most commonly used by the target population. Field Workers should be familiar with the utensils and their abbreviations. Ideally, Field Workers should be involved in generating the list and deciding how to abbreviate each utensil to best remember the abbreviation. The abbreviations should be as clear as possible to Field Workers and the Supervisor.
- *Liquid and food densities for converting volume to weight.* This information is used to convert liquid volumes expressed in milliliters to weight in grams. This type of data is needed for liquids for which 1 ml does not weigh 1 g (e.g., oil). The conversion measurements are calculated by weighing liquids with the household measures most commonly used by the target population (e.g., a teaspoon, tablespoon, or cup).
- *Food codes from the ProPAN Food Composition Table.* Each food item in the **ProPAN** Food Composition Table has a code that can be used when calculating nutrient and energy content.

Materials required for the data analysis:

- **ProPAN software**, which contains instructions for data analysis

#### 4. Personnel and time

Field Workers should be able to apply the 24-hour Dietary Recall and Anthropometry instrument to at least three survey participants each day, including all of the required calculations performed in the Office Work phase. It is recommended that the Supervisor be a nutritionist with fieldwork experience.

#### 5. Description and procedures

The application of the *24-hour Dietary Recall and Anthropometry* comprises two main components: data collection in the sampled communities (fieldwork), and measurements and calculations using the collected data (Office Work phase) to obtain the amount of net grams consumed by each child in the study.

Before implementing the *24-hour Dietary Recall and Anthropometry*, unique codes should be assigned to each study community (e.g., Community A = “1,” Community B = “2,” etc.); Field Worker (e.g., Field Worker A = “1,” Field Worker B = “2,” etc.); and child studied (e.g., first child = “1,” second child = “2,” etc.). Care should be taken to ensure that the assigned codes are not duplicated (e.g., avoid giving the same code to different Field Workers).

In **ProPAN**, different procedures are used for ingredients versus dishes, as explained below.

- **Ingredients.** Ingredients can be 1) of either animal or vegetable origin (e.g., mango and pearl millet); 2) solid, semi-solid (e.g., mango), or liquid (e.g., milk, and juice beverages); and 3) processed and ready-to-eat (e.g., corn flakes and sweet bread) or raw (e.g., lettuce). It is important to document the consumption of liquids like coffee and tea carefully, because even though they have limited nutritional value they are often consumed with sugar, and they can influence the absorption of nutrients.
- **Dishes.** Within the context of **ProPAN**, “dish” refers to the mixing of various foods according to a recipe (e.g., chicken and rice soup, and vegetable and meat stew). To calculate nutritional content, information must be obtained about all ingredients in the dish and how much of each is used. For example, a noodle soup (“dish”) could contain water, pasta, oil, tomato, onion, condiments, and chicken broth (“ingredients”). In order to separate the dish into its respective ingredients, the recipe is required, including all ingredients and amounts used. For recipes in which the ingredients can be easily separated, they can be handled as separate foods from the start (e.g., “corn flakes with fruit and milk”).

#### 6. Analysis

The **ProPAN software** package analyzes the data collected for each 24-hour Dietary Recall and Anthropometry, yielding the products (outcomes) listed below.

When only one 24-hour dietary recall is collected and analyzed per child, the standard deviation for energy and nutrients consumed is wider than if two or more are collected and analyzed per child. This is because of the large variation in children’s food and liquid intakes from one day to another. In addition, when only one 24-hour dietary recall is collected and analyzed per child, the percent of children who meet their requirements is under-estimated (Willett, 1998). Therefore, experts recommend administer-

ing a second 24-hour dietary recall on a non-consecutive day after the first recall was administered, on a subset of children (e.g., 30 children).

Unfortunately, the **ProPAN** software cannot make any calculations for subjects with multiple sets of data for the *24-hour Dietary Recall and Anthropometry*. Therefore, if more than one 24-hour dietary recall is collected, the mean energy and nutrient intakes and standard deviations for the multiple sets of data must be calculated by the research team, and the percentage of children who qualified as “meeting their requirements” recalculated (Carriquiry, 2003 Feb). A statistician may need to be consulted for assistance with this part of the analysis.

### **24-hour Dietary Recall and Anthropometry Guide (for Form I-4.1)**

The *24-hour Dietary Recall and Anthropometry* instrument is a three-page form with four sections (A–D). The first page ([Section A](#)) is for preliminary (basic) information about the child (e.g., name, age and sex, and anthropometric data, if obtained) (see Exhibit A). The second page ([Section B](#)) is for information about all foods and liquids consumed by the child, and the mealtime when they were consumed (see Exhibit B). The top section of the third page ([Section C](#)) is used to obtain more detailed information about foods and liquids eaten by the child in order to estimate the exact quantities (gross and net weight) consumed (see Exhibits C and D). The bottom section of the third page ([Section D](#)) is used only if the child was given a dish that fed several people or was eaten over several mealtimes (see Exhibit E). The space provided is for calculating how much of the dish the child ate.

Applying the *24-hour Dietary Recall and Anthropometry* yields various types of information, including the following:

- Preliminary information (including anthropometric data)
- Information about
  - consumption of a specific food
  - consumption of a specific dish
  - consumption of a dish not made by the caregiver
  - the weekly frequency of consumption of the different foods.

#### **Section A. Preliminary information (including anthropometric data)**

Before administering the *24-hour Dietary Recall and Anthropometry* to the survey respondent (the primary caregiver), explain the project objectives and how the dietary intake data will be collected. Make sure that the respondent is the person who fed the child during the previous 24 hours. If multiple people fed the child during that period, ask if you can speak with all of them. If that is not possible, the person who fed the child the most meals the previous day should be the one interviewed.

Request the caregiver’s signed consent to participate in the study (see [Consent Letter and Form, Form I-2.1](#)). Explain the objective of the study clearly and emphasize that the information provided will be strictly confidential. If the caregiver agrees to participate, obtain her signature, provide her with a copy, and apply Section A of the survey to obtain the basic information shown in the sample (Exhibit A). Coordination with a second Field Worker is necessary to collect the anthropometric data, especially the measurement of the child’s body length.

**Exhibit A. Sample data for section A of the 24-hour Dietary Recall and Anthropometry form  
(preliminary information, including anthropometric data)**

1. Child's code: <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">2</span> <span style="border: 1px solid black; padding: 2px 5px;">4</span> <span style="border: 1px solid black; padding: 2px 5px;">7</span>	2. Date of interview <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">1</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">2</span> <span style="border: 1px solid black; padding: 2px 5px;">2</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">1</span> <span style="border: 1px solid black; padding: 2px 5px;">1</span>	3. Location <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">1</span>	
		Day      Month      Year	
4. Field worker's code: <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">4</span>			
Child's name: <span style="float: right;"><b>Kabila</b>      <b>Inoni</b>      <b>Soadou</b></span> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>Paternal last name</span> <span>Maternal last name</span> <span>First name</span> </div>			
Caregiver's name: <span style="float: right;"><b>Inoni</b>      <b>Suleiman</b>      <b>Fatima</b></span> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>Paternal last name</span> <span>Maternal last name</span> <span>First name</span> </div>			
5. Child's sex (1 = M, 2 = F) <span style="border: 1px solid black; padding: 2px 5px;">2</span>		6. Date of birth: <span style="border: 1px solid black; padding: 2px 5px;">1</span> <span style="border: 1px solid black; padding: 2px 5px;">5</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">3</span> <span style="border: 1px solid black; padding: 2px 5px;">2</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">9</span>	
		Day      Month      Year	
7. Age (months): <span style="border: 1px solid black; padding: 2px 5px;">2</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span> IF THE CHILD IS YOUNGER THAN 6.0 MONTHS OR 24.0 MONTHS OLD OR OLDER, DO NOT APPLY THE SURVEY			
8. Was (child) breastfed yesterday? <span style="border: 1px solid black; padding: 2px 5px;">1</span> (0 = No, 1 = Yes)		9. Yesterday, was it a holiday in the community? <span style="border: 1px solid black; padding: 2px 5px;">0</span> (0 = No, 1 = Yes)	
10. Yesterday, was there a celebration in the family? <span style="border: 1px solid black; padding: 2px 5px;">0</span> (0 = No, 1 = Yes)		11. Yesterday, was the child sick with fever, cough or diarrhea? <span style="border: 1px solid black; padding: 2px 5px;">0</span> (0 = No, 1 = Yes)	
If anthropometric measurements were taken:			
12. Child weight in kilograms <span style="border: 1px solid black; padding: 2px 5px;">1</span> <span style="border: 1px solid black; padding: 2px 5px;">3</span> <span style="border: 1px solid black; padding: 2px 5px;">.</span> <span style="border: 1px solid black; padding: 2px 5px;">3</span>		13. Child height in centimeters <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">8</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span> <span style="border: 1px solid black; padding: 2px 5px;">.</span> <span style="border: 1px solid black; padding: 2px 5px;">7</span>	
14. Child MUAC in millimeters <span style="border: 1px solid black; padding: 2px 5px;">1</span> <span style="border: 1px solid black; padding: 2px 5px;">6</span> <span style="border: 1px solid black; padding: 2px 5px;">7</span> <span style="border: 1px solid black; padding: 2px 5px;">.</span> <span style="border: 1px solid black; padding: 2px 5px;">0</span>			

## Section A Instruction Sheet

1. Child's code Write the unique four-digit code that identifies the child. Note: This code should be assigned by a Supervisor.
2. Date of interview Write the date the form was applied, beginning with the day (from 01 to 31), then the month (using two digits from 01 to 12), and ending with the year (using four digits).
3. Location Write the code previously assigned by the Supervisor to identify the location of the community.
4. Field Worker's code Write the code that was assigned by the Supervisor.
- Child's name Write the child's complete name, starting with the paternal last name, followed by the maternal last name, and the first name.
- Caregiver's name Write the caregiver's complete name, starting with the paternal last name, maternal last name and continuing with the first name.
5. Child's sex Write "1" for a boy and "2" for a girl.
6. Date of birth Write the child's date of birth, starting with the day (using two digits from 01 to 31), then the month (using two digits from 01 to 12), and the year (using four digits).
7. Child's age (in months) Write the child's age in two-digit whole-number months (i.e., "06" through "23"). **Note: If the child is under 6 months old or 24 months old or older, do not continue the survey.**
8. *Was the child breastfed yesterday?* Write "1" if the answer is "Yes" and "0" if the answer is "No."
9. *Was yesterday a holiday in the community?* Write "1" if the answer is "Yes" and "0" if the answer is "No." Note: The 24-hour Dietary Recall and Anthropometry should be applied even if the previous day was a holiday.
10. *Was yesterday a celebration in the family?* Write "1" if the answer is "Yes" and "0" if the answer is "No." Note: The 24-hour Dietary Recall and Anthropometry should be applied even if the previous day was a family celebration.
11. *Was the child sick with fever, cough, or diarrhea yesterday?* Write "1" if the answer is "Yes" and "0" if the answer is "No." Note: The 24-hour Dietary Recall and Anthropometry should be applied even if the child was sick the previous day.
12. Child's weight [Optional] Write the child's weight in kilograms. Detailed instructions for conducting the measurement can be found in a video developed by WHO [www.who.int/childgrowth/training/en](http://www.who.int/childgrowth/training/en)
13. Child's length [Optional] Write the child's length in centimeters. Detailed instructions for conducting the measurement can be found in a video developed by WHO <http://www.who.int/childgrowth/training/en>  
Two Field Workers are needed to accurately measure children's length.
14. Child's mid-upper arm circumference (MUAC) [optional] Write the value for the child's MUAC in millimeters. Detailed instructions for conducting this measurement can be found in a video developed by WHO <http://www.who.int/childgrowth/training/en>

**Explain the process to the caregiver**

Helping the caregiver remember Help the caregiver remember the day before (from the moment the child woke up yesterday until the moment the child woke up today), according to the child's schedule and daily activities. Go slowly. Begin by saying: *I would like you to tell me everything the child ate and drank yesterday. After he/she woke up, what was the first thing you gave him/her to eat or drink? Then, what other food or drink did you give him/her?* Alternatively, you can ask about the caregiver and child's activities on the previous day; this may help the caregiver to recall what the child ate.

Write all the foods, liquids, or dishes consumed the day before that the caregiver mentions on the second page of the form (Form I-4.1). Do not forget to 1) ask the caregiver *"What do you call that mealtime?"* and 2) write down the response (see sample in first column of Exhibit B).

**Exhibit B. Sample data for section B of the 24-hour Dietary Recall and Anthropometry (foods and dishes caregivers report children consuming)**

Mealtime (as defined by caregiver)	Name of food or dish
Breakfast	Instant quinoa
Breakfast	Banana
Mid-morning snack	Yogurt
Mid-morning snack	Concha <sup>12</sup>
Lunch	Fried egg
Lunch	Rice
Dinner	Goose soup
Evening snack	Peanut atole <sup>13</sup>

Once the caregiver has mentioned all the foods and dishes consumed the day before, transfer the information to the second page of the *24-hour Dietary Recall and Anthropometry* form (in the columns labeled "Mealtime" and "Name of food or dish"). Then ask the caregiver to tell you 1) characteristics specific to that type of food or dish (e.g., size, color, brand); 2) how much was served to the child; and 3) how much the child ate (e.g., *"What was the food that you served [child's name] like?"* *"How much did you serve [child's name]?"* *"Did [child's name] eat everything that you served him/her?"*)

The purpose of talking with the caregiver is to obtain the best possible approximation of what was served to the child and how much the child ate. Ideally, the amounts served and consumed will be obtained by weighing the foods in the home. If this is not possible, other methods (described below) can be used.

In addition, questions should be asked about the way in which foods were prepared (e.g., fried or cooked) or served (e.g., with or without bones) and all information should be taken into account when calculating how much in net grams of raw food or dish ingredients was served to the child and how much the child ate.

<sup>12</sup> Sweet bread that is a breakfast staple in Mexico. It uses a dough rich in sugars, butter and eggs.

<sup>13</sup> Cereal-based drink often consumed in Central America and also given to young children.

**Section C. When dealing with a food item, follow these steps:**

1. After writing the food name in the “Name of food or dish” column, write the food type (e.g., brand and color) on the same row and in the column labeled “Ingredients and characteristics.”

Remember that the main objective of the *24-hour Dietary Recall and Anthropometry* is to determine what quantities of food were served and ultimately eaten by the child. Points 2, 3, 4, and 5 below describe different ways to obtain these food quantities.

2. Ask the caregiver the following question: *Can you show me, in the same plate (cup, bowl) that you used to serve this food to the child, how much you served him/her?* If she has in her home the same food she served the child and the plate (or cup or bowl) that she served it on, ask her to place the empty plate on the food scale. Tare (zero out) the container on the food scale (i.e., place the empty plate on the food scale and press the “tare” button to make the food scale numbers return to zero so that the food scale will only weigh the food that is placed on the plate).

Then ask the caregiver to fill the plate with the same amount that she served to the child the previous day. Write the weight obtained in grams from the food scale in the column labeled “Served” in “Measurements taken in the home” (see example in Exhibit C).

If the caregiver did not serve the food on a plate (e.g., fruit), ask her to place the similarly sized food on the scale and write the number of grams in the column labeled “Served” under “Measurements taken in the home.”

It is possible that upon weighing the food, you will have to weigh it with skin/peel, bone, pits/seeds or other parts of the food that the child did not eat (see example in Exhibit C). Weigh the food and write the appropriate number in the column “Weighed” where 1 (gross) means you weighed the food with the non-edible portion (with skin/peel, bone, pits, seeds, etc.) and 2 (net) means you weighed it without the non-edible portion (without the skin/peel, etc.). Later on, in the office, you will need to calculate the edible portion for all those foods with a value of 1 in this column.

3. If some foods cannot be weighed in the home, several other options are possible. Before the home visits begin, the research team can buy food models or make them from clay, Play-Doh<sup>14</sup> or paper-mache<sup>15</sup>. They can also make two-dimensional silhouettes of food shapes (by tracing the outline of foods) or take pictures of different-size foods, including a reference in the frame (e.g., a ruler or a person’s hand). These visual aids can then be shown to the caregiver to help her estimate the approximate size of the foods served to the child.

It is important to generate identical sets of these visual aids for each Field Worker. It is also important that each model, silhouette, or picture include the average weight in grams of the food of that particular size (e.g., small = 22 g, medium = 32 g, and large = 41 g), and the weight range (e.g., small = 20–25 g, medium = 31–39 g, and large = 42–53 g). To create the model, silhouette, or picture, a sample of different foods and different sizes of each food should be weighed in a kitchen or laboratory. If possible, the foods should be purchased in the study communities and the entire research team should participate in identifying the foods, their different sizes, and their average weights.

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<sup>14</sup> Non-toxic modeling compound that can be used to make food samples.

<sup>15</sup> Composite material consisting of paper pieces or pulp bound with an adhesive, such as glue or starch

4. If the food cannot be weighed in the home, you can ask the caregiver to show you the plate, bowl, cup, or utensil she used to serve the food to the child (so you can identify it according to the information shown in Weights and measurements of foods (Form I-4.4)). Ask her how much of the food she served onto the plate/bowl/cup or using the utensil (this is the “household measure”). Write the amount, including the household measure, in the column labeled “Served” under “Measurements taken in the home.” For example, if she served 1/2 cup of quinoa, and the abbreviation for cup is “C,” in the column “Amount served in measurements taken in the home,” you would write “1/2 C” (see example in Exhibit C and read the description below it).

If 1) the volume of liquids consumed is estimated using household measures, 2) 1 ml of the liquid does not weigh 1 g, and 3) the weight of that volume of the liquid is not listed in *Weights and measurements of foods*, write “1” in the column labeled “Weighed.” Later, in the office, you will need to calculate the number of grams in the volume of liquid using the list of Liquid densities for converting volume to weight (Form I-4.6) provided in this Annex or one created by the research team.

5. Be sure to ask the caregiver if the food she served to the child was cooked or raw. In steps 1, 2, 3, and 4, the amounts served and consumed by the child should refer to the form in which it was served to the child (i.e., whether it was cooked or raw). For example, if *raw* food was served to the child, the food should be weighed *raw* or its weight should be estimated using models, silhouettes, or photos of the *raw* food. Similarly, if *cooked* food was served to the child, the food should be weighed *cooked* or its weight should be estimated using models, silhouettes, or photos of the *cooked* food.

If the food was cooked, write 1 in the column labeled “Consumed” (see example in Exhibit C). In the column labeled “Ingredients and characteristics,” make note of how the food was cooked (boiled, fried, or baked) and approximately for how long. Later in the office, for those foods with 1 in the column labeled “How consumed” (i.e., for those foods served cooked to the child, that only have information in the Food Composition Table for the raw form), you will need to convert them to their raw equivalents.

If the food was served raw, write “2” in the column labeled “How consumed.”

6. With the information you obtained in steps 2, 3, 4, and 5, you will have filled out the following columns under “Measurements taken in the home”: “Served,” “Weighed,” and “How consumed.” Next, you will ask about what the child did not eat in order to calculate what the child did eat.

If you are weighing the food, ask the caregiver to leave what the child did not eat in the plate/bowl/cup. Weigh the amount the child did not eat and write the number obtained in grams in the column labeled “Not consumed” under “Measurements taken in the home” (see example in Exhibit C).

If you are estimating amount served and consumed by using models/silhouettes/photos or household measures, ask how much the child left and write this amount in the column labeled “Amount not consumed in measurements taken in the home.”

7. Finally, calculate how much food the child ate by subtracting the amount “Not consumed” from the amount “Served” under the heading “Measurements taken in the home.” Write the difference in the column labeled “Consumed.” See Exhibit C for an example.

**Exhibit C. Sample data for section C of the 24-hour Dietary Recall and Anthropometry (“Measurements taken in the home”)**

Meal-time	Name of food or dish	Ingredients and characteristics	Code (Office)	Measurements taken in the home						Conversion to grams	Net Grams	
				Served	Not Consumed	Consumed	Weighed (1=gross 2=net)	How consumed (1=cooked 2=raw)	Days consumed in past week		Served	Consumed
10	Quinoa	Instant		1/2 C	0	1/2 C	2	1				
10	Banana	With peel		116 g	2/3	1/3	1	2				
11	Yogurt	Strawberry, 1 portion		1 portion (226 g)	1/2	1/2	2	2				
11	Concha	Small		32 g	1/2	1/2	2	2				

In this example, different methods were used to estimate the amounts served (not consumed and consumed).

The instant quinoa was served cooked to the child (“1” was written in the column labeled “Consumed”). The cooked quinoa was weighed and it did not have an inedible portion (i.e., it was 100% edible (“2” was written in the column labeled “Weighed”). The child was served 1/2 cup (abbreviated as “C”) and she ate it all. Afterward, in the office, you will need to find out how many grams of cooked instant quinoa there are in 1/2 cup (using Weights and measurements of foods, Form I-4.4). If the Food Composition Table does not have nutrition information on cooked quinoa, you will need to calculate how many grams of raw quinoa there were in the cooked amounts served and consumed.

In addition to the quinoa, the child was served banana at breakfast (mealtime 10). In the home, it was only possible to weigh a banana with the peel (i.e., with an inedible portion) so “1” was written in the column labeled “Weighed.” The banana with peel weighed 116 g and the caregiver determined that the child left 2/3 and ate 1/3 of the banana. Later, in the office, you will need to calculate the edible portion of the banana.

The yogurt came in a plastic container weighing 226 g (according to the label). The child did not consume half the container and ate the other half.

For concha, the amount was estimated with a medium-size model, which has an average weight of 32 g (according to the kitchen work done by the research team). The child left half and ate half of the bread during a mid-morning snack (mealtime 11).

**Section C. When dealing with a dish, follow these steps:**

1. Write the name of the dish in the column labeled “Name of food or dish.” In the column labeled “Ingredients and characteristics,” write each ingredient used in preparing that dish. If salt was used, do not forget to ask what type of salt was used (iodized, sea salt, granulated, etc.).
2. If the mixed dish was prepared only for the child and only for one mealtime (e.g., lunch), list the ingredients following the example below (Exhibit D). The “Measurements taken in the home” for each ingredient should be obtained in the same way they were obtained for food items, following Steps 1–7 in Section B.

**Exhibit D. Sample data for section C of the 24-hour Dietary Recall  
and Anthropometry (“Ingredients and characteristics”)**

Meal-time	Name of food or dish	Ingredients and characteristics	Code (Office)	Measurements taken in the home						Conversion to grams	Net Grams	
				Served	Not Consumed	Consumed	Weighed (1=gross 2=net)	How consumed (1=cooked 2=raw)	Days consumed in past week		Served	Consumed
20	Egg	Fried										
		Egg		1 large	0	52 g	2	1				
		Palm oil		1 tsb	0	1 tsp	1	2				
		Iodized salt		1 g	0	1 g	2	2				
20	Rice	White, boiled 25 minutes		4 Ss <sup>a</sup>	2 Ss	2Ss	2	1				

<sup>a</sup> Ss: soup spoons (as agreed by the research team).

In the same row with the name of the dish, in this case a fried egg, these columns should be filled in: “Name of food or dish,” and under “Measurements taken in the home,” the columns “Served,” “Not consumed,” and “Consumed.”

For each ingredient, these columns should be filled in: “Mealtime,” “Ingredients and characteristics,” “Served,” “Not consumed,” “Consumed,” “Weighed” (1=gross or 2=net), and “How consumed” (1=cooked or 2=raw), all under “Measurements taken in the home.”

In this example, the caregiver served one fried egg and the child ate all of it (Exhibit D). So the amount “Served” was 1, the amount “Not consumed” was 0, and the amount “Consumed” was 1.

The fried egg was prepared for the child’s lunch only (mealtime 20) and had three ingredients: egg, oil, and salt. Photos of several egg sizes were shown to the caregiver and she indicated that she served the large size to the child. On the back of the photo of the large, it was noted that a large egg, without the shell, weighs 52 g on average. The child ate a cooked egg (“1” was written under the column labeled “How consumed”) and the estimated weight of the egg excluded the inedible shell (“2” was written under the column labeled “Weighed”). The volume of palm oil was estimated at 1 tsp using household measures.

Because 1) the volume of the palm oil was estimated using household measures, 2) 1 ml of palm oil does not weigh 1 g, and 3) the weight of that 1 tsp of palm oil is not listed in *Weights and measurements of foods*, “1” was written under the column labeled “Weighed.” The net amount of palm oil consumed will be calculated during the Office Work phase. The amount of iodized salt used was weighed (1 g).

For lunch, the caregiver also prepared cooked rice without salt. The white rice was boiled for approximately 25 minutes (note this information in the “Ingredients and characteristics” column). She served 4 soup spoons (abbreviated as “Ss,” as agreed by the research team), so “Served” = 4 Ss of cooked rice (and the code for the column labeled “Consumed” = 1). The child did not consume half of what was served to her (“Not consumed” = 2 Ss) and thus ate half of what was served to her (“Consumed” = 2 Ss).

3. If a mixed dish was prepared for the family or was prepared to be served several times throughout the day to the child, use the lower part of the form to note what ingredients were used in the mixed dish (in the “Ingredients and characteristics” column). Following Steps 1–7 of the Food section (Section C), write how much of each ingredient was used in the dish in the column labeled “Quantity used” (see example in Exhibit E). Note if the ingredient’s weight (or estimated weight) was obtained in gross or net (in the column labeled “Weighed” (1 = gross or 2 = net)) and if the ingredient was cooked or raw when it was added to the dish (in the column labeled “Used” (1=cooked or 2=raw)).

#### Exhibit E. Sample breakdown of dish ingredients

Dish: Goose soup Ingredients	Quantity used	Weighed (1=gross 2=net)	Used (1=cooked 2=raw)	Total weight of cooked ingredients: Conversion to cooked	Cooked grams
Goose drumstick with bone	1 kg	1	2		
Vegetable oil	30 g	2	2		
White onion, large	2 (144 g each)	2	2		
Water	2 liters	2	2		
Bouillon with tomato flavor	1 cube	2	2		
Iodized salt	5 g	2	2		

This dish (goose soup), which was prepared as a dinner for the entire family, consisted of 1 kg of goose (with bone), 30 g of vegetable oil, 2 large white onions weighing 144 g each, 2 L of water, 1 bouillon cube with tomato flavor (which was weighed later: 15 g), and 5 g of iodized salt.

4. As the soup was prepared for many people or many mealtimes, the amount served to and eaten by the child for the mealtime of interest must be determined. This can be done by weighing the food (e.g., if there were leftovers), or by using models/silhouettes/photos (if available for dishes) or the list of Weights and measurements of foods (Form I-4.4). This information should be written under “Measurements taken in the home” in the columns labeled “Served,” “Not consumed,” and “Consumed.” See the example in Exhibit F.

**Exhibit F. Sample data for food amount served to and consumed by child**

Meal-time	Name of food or dish	Ingredients and characteristics	Code (Office)	Measurements taken in the home						Conversion to grams	Net Grams	
				Served	Not Consumed	Consumed	Weighed (1=gross 2=net)	How consumed (1=cooked 2=raw)	Days consumed in past week		Served	Consumed
30	Goose soup			80 g	0	80 g						

**Section D. When dealing with a dish not prepared by the caregiver, follow these steps:**

1. Use the upper part of the form to fill in the columns labeled: “Mealtime,” “Name of food or dish,” and [under “Measurements taken in the home”] “Served,” “Not consumed,” and “Consumed.” Below this row, leave several rows empty to write in the ingredients used in the dish.
2. Find out where the dish was bought or from whom it was obtained. After completing the home visit, you will want to visit the person who prepared the mixed dish to get the ingredient information noted in Step 3 in Section C for dishes.
3. If you are unable to obtain the ingredient information, you could use the information for an “average dish,” which lists the nutrient information for the dish as a whole. The Food Composition Table in the **ProPAN** software program lists this information for some common dishes in the developing world. It may be possible to find other “average dishes” in national food composition tables or to develop them in a kitchen or laboratory with the Field Workers or community members (see [Instructions for familiarization with local foods and dishes](#)).

If you use an “average dish,” it is not necessary to fill in the columns “Weighed” (1=gross or 2=net) or “Consumed” (1=cooked or 2=raw) because the nutrient information in the Food Composition Table for the dish will have already taken these two factors into account (Exhibit G).

**Exhibit G. Sample data for the “Weighed” and “How consumed” columns for a dish listed in the ProPAN Food Composition Table**

Meal-time	Name of food or dish	Ingredients and characteristics	Code (Office)	Measurements taken in the home						Conversion to grams	Net Grams	
				Served	Not Consumed	Consumed	Weighed (1=gross 2=net)	How consumed (1=cooked 2=raw)	Days consumed in past week		Served	Consumed
3 1	Atole	Peanut		1 C	0	1 C	--	--				

**Section E. To collect information on the weekly frequency with which foods were consumed, follow these steps:**

To estimate the weekly frequency with which foods (and ingredients in dishes) were consumed by the child, go back to the first food or dish consumed and ask the caregiver: *In the past week, how many days did you give this food to the child?* Repeat this question for every food and dish ingredient listed on the form. The number of days the child consumed each food in the past 7 days will be a minimum of 1 and a maximum of 7. If a child consumed each food once every day in the past week, the number of days will be 7. Observe the example shown in Exhibit H, which indicates fried egg was consumed 5 days in the last week and rice was consumed daily in the past week.

**Exhibit H. Sample data for “Days consumed in past week”  
for all food and dish ingredients**

Meal-time	Name of food or dish	Ingredients and characteristics	Code (Office)	Measurements taken in the home						Conversion to grams	Net Grams	
				Served	Not Consumed	Consumed	Weighed (1=gross 2=net)	How consumed (1=cooked 2=raw)	Days consumed in past week		Served	Consumed
2 0	Egg	Fried										
		Egg		1 large (52 g)	0	52 g	2	1	5			
		Palm oil		1 tsp	0	1 tsp	1	2	5			
		Iodized salt		1 g	0	1 g	2	2	5			
2 0	Rice	White, boiled 25 minutes		4 Ss <sup>a</sup>	2 Ss	2 Ss	2	1	7			

a Ss: soup spoons (as agreed by the research team).

In summary, the following information should be collected during the home visit:

1. Mealtime
2. Name of food or dish
3. Ingredients and their characteristics
4. Amount served to child (based on household measures)
5. Amount not consumed by child (based on household measures)
6. Amount consumed by child (based on household measures)
7. Whether the food's weight was obtained with inedible portions (gross grams) or completely edible (net grams)
8. Whether the food served to child was cooked or raw
9. The weekly frequency with which the food was consumed by the child

Field Workers should obtain all information described above so that they have all inputs required for the Office Work calculations of net grams of food and liquid served and consumed. If the information is incomplete, they will have to return to the home to obtain the missing information. If possible, all foods, dishes, and separable ingredients should be weighed and measured during the home visits to obtain the most accurate data.

## 24-hour Dietary Recall and Anthropometry Form (Form I-4.1)

### Registration Form

Good morning, my name is \_\_\_\_\_ and I'm working on a child feeding project for the \_\_\_\_\_.  
 Could I ask you some questions regarding what the child you care for ate yesterday? The information that you provide will remain confidential.

1. Child's code:	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	2. Date of interview	<input type="text"/> <input type="text"/> Day	<input type="text"/> <input type="text"/> Month	<input type="text"/> <input type="text"/> Year	3. Location	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	4. Field worker's code:	<input type="text"/> <input type="text"/>	
Child's name: _____										
Caregiver's name: _____			Paternal last name		Maternal last name		First name			
			Paternal last name		Maternal last name		First name			
5. Child's sex (1 = M, 2 = F)		6. Date of birth:		<input type="text"/> <input type="text"/> Day	<input type="text"/> <input type="text"/> Month	<input type="text"/> <input type="text"/> Year				
7. Age (months):		NOTE: IF THE CHILD IS YOUNGER THAN 6.0 MONTHS OR 24.0 MONTHS OLD OR OLDER, DO NOT APPLY THE SURVEY								
				<input type="text"/> <input type="text"/>	9. Yesterday, was it a holiday in the community? (0 = No, 1 = Yes)					<input type="text"/>
10. Yesterday, was there a celebration in the family? (0 = No, 1 = Yes)				<input type="text"/> <input type="text"/>	11. Yesterday, was the child sick with fever, cough or diarrhea? (0 = No, 1 = Yes)					<input type="text"/>
If anthropometric measurements were taken:										
12. Child weight in kilograms		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	13. Child length in centimeters							<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
14. Child mid-upper arm circumference (MUAC) in millimeters										<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

Explain the questionnaire to the caregiver before beginning.

Help her recall (remember) the previous day, based on the times when the child woke up, the activities the child had, etc. Go slowly.

*After the child woke up, what was the first thing you gave him/her to eat or drink?*

*After that, what other food or drink did you offer the child?*

Write all the foods or dishes consumed the day before that the caregiver mentions.

Be sure to ask this: *What is the name of that mealtime (e.g., breakfast, lunch, or dinner, or morning, afternoon, or evening snack)?*

[illegible]

Mealtime: 10 morning (breakfast); 20 midday (lunch); 30 evening (dinner)  
Main meals: 01, 02, 03 ... 09 morning (before breakfast); 11, 12, 13 ... 19 morning (after breakfast); 21, 22, 23 ... 29 afternoon; 31, 32, 33 ... 39 evening  
Snacks:

[illegible]

### **Office Work: calculating net grams of liquid and solid foods served and consumed**

The Office Work phase consists of two main steps. In the first step, the mealtime, food, dish, and ingredient codes are noted. In the second step, measurements taken in the home of the amounts served to and consumed by the child are converted to grams. Both steps are described in detail below.

#### **1. Determining mealtime codes**

For Item 15 (mealtime codes) on the third page of the form, every food or dish ingredient should have a mealtime code assigned. The caregiver reported on the second page of the form the name of the mealtime when the child ate each food or dish. Use this information to assign the code to main meals and snacks, as follows:

Write “10” for the main morning meal (breakfast), “20” for the main midday meal (lunch), and “30” for the main evening meal (dinner). Snacks should be coded as follows:

- The first snack given in the morning before main morning meal: 01
- The second snack given in the morning before main morning meal: 02
- The third snack given in the morning before main morning meal: 03

Similar coding applies to other snacks, as shown in Exhibit I. An example of mealtime coding is shown in Exhibit J.

**Exhibit I. Sample snack codes**

Main Meal	Snack	Code
	Consumed before main morning meal	01, 02, 03....09
Morning		10
	Consumed between main morning and midday meals	11, 12, 13...19
Midday		20
	Consumed between main midday and evening meals	21, 22, 23....29
Evening		30
	Consumed after main evening meal	31, 32, 33....39

**Exhibit J. Sample mealtime codes based on mealtime classifications reported by caregiver**

Meal-time	Name of food or dish	Ingredients and characteristics	Code (Office)	Measurements taken in the home						Conversion to grams	Net Grams	
				Served	Not Consumed	Consumed	Weighed (1=gross 2=net)	How consumed (1=cooked 2=raw)	Days consumed in past week		Served	Consumed
10	Quinoa	Instant		½ C	0	½ C	2	1	2			
10	Banana	With peel		116 g	2/3	1/3	1	2	7			
11	Yogurt	Strawberry, 1 portion		1 portion (226 g)	½	½	2	2	5			
11	Concha	Small		32 g	½	½	2	2	5			
20	Egg	Fried		1	0	1						
		Egg		1 large (52 g)	0	52 g	2	1	5			
		Palm oil		1 tsp	0	1 tsp	1	2	5			
		Iodized salt		1 g	0	1 g	2	2	5			
20	Rice	White, boiled 25 minutes		4 Ss	2 Ss	2 Ss <sup>a</sup>	2	1	7			
30	Goose soup			80 g	0	80 g						
		Goose drumstick with bone							1			
		Vegetable oil							5			
		White onion, large							7			
		Water							7			
		Bouillon with tomato flavor							1			
		Iodized salt							7			
31	Atole	Peanut		1 C	0	1 C	–	–	4			

a Ss: soup spoons (as per measures agreed upon by research team).

## 2. Determining food codes

Using the list of food codes in the **ProPAN** Food Composition Table (see software manual at [www.paho.org/ProPAN](http://www.paho.org/ProPAN)) or the food composition table that you have uploaded into the **ProPAN** software, write the code corresponding to each food and to each ingredient used in the dish. The food codes in the list should coincide with those in the Food Composition Table for the calculation of the nutrient and energy content of each food. For example, code 70004 corresponds to “mango (raw)” in the **ProPAN** Food Composition Table.

In most cases, only the raw form of foods appears in the **ProPAN** Food Composition Table. In some cases, foods appear in their raw and cooked forms. For example, “deer, meat (raw)” is listed as code 60102 in the table, and “deer, cooked (roasted)” has code 60103. In those cases where the child ate the cooked form of the food and the cooked form appears in the Food Composition Table, use the food code corresponding to the cooked (not the raw) form.

Some dishes have codes that are used in cases where the caregiver did not prepare the food or it was not possible to obtain information on the ingredients that made up the dish. Examples of dishes in the **ProPAN** Food Composition Table are “pancakes” 20103 and “pecan pie” 110071. To reiterate, only fill in the column labeled “Code” for a dish if it was not possible to separate it into its multiple ingredients and the dish is listed in the Food Composition Table being used to estimate nutrient intake.

Even if breast milk is listed in the **ProPAN** Food Composition Table, breast milk will not be coded (in the column labeled “Code”) nor will any information be written in the columns labeled “Measurements taken in the home.” The amount of breast milk consumed by children is usually obtained by weighing the child before and after breastfeeding and this method will not be followed during the *24-hour Dietary Recall and Anthropometry*.

The food and dish codes available in the Food Composition Table included in the **ProPAN** software can be observed on a computer screen and printed out for reference (see **ProPAN** Software User’s Guide).

### 3. Considerations when converting ingredients to net grams

This section provides guidelines for carrying out the calculations required to convert each food and ingredient to net grams of raw food. In other words, the number of grams of food in its raw form and without the non-edible portion (seed, bone, or skin). If the food appears in the Food Composition Table as cooked, only the calculation of the non-edible portion is needed and the Food Composition Table code corresponding to the cooked food is used (Exhibit K).

#### Exhibit K. Calculations required to convert food/ ingredient to net grams of raw food based on ProPAN Food Composition Table classification (cooked versus raw)

How food or liquid appears in ProPAN Food Composition Table <sup>a</sup>	How food or liquid was reported by caregiver	Calculate the non-edible portion	Apply cooked-to-raw conversion factors (Form I-4.3)	Estimate the weight in grams of liquid consumed <sup>b</sup>
Raw	Raw	Yes, if applicable	No	Yes, if applicable
Raw	Cooked	Yes, if applicable	Yes, apply the inverse of the cooked-to-raw factor	Yes, if applicable
Cooked	Raw	Yes, if applicable	Yes, apply the cooked-to-raw factor	Yes, if applicable
Cooked	Cooked	Yes, if applicable	No	Yes, if applicable

a For example, “10104” for “Maize flour, white variety, whole-grain, raw” and “10108” for “Maize flour, whole-grain, stiff porridge, boiled.”

b Using Weights and measurements of foods (Form I-4.4) or Liquid densities for converting volume to weight (Form I-4.6).

- If the food was weighed with the non-edible portion, that portion will need to be removed (see Edible portions of foods, Form I-4.2). This will be done by multiplying the weight of the food by a factor that has a value from 0 (i.e., nothing is edible) to 1.0 (i.e., everything is edible).
- If 1) a food was served cooked to the child and 2) this food only appears in raw form in the Food Composition Table, the grams served and consumed will need to be converted to their raw form using the Cooked to raw conversion factors (Form I-4.3). This factor will have a value starting at 0. If < 1, the food volume increases when cooked (e.g., rice). If > 1, the food volume decreases when cooked (e.g., meat).
- If only the volume of a liquid was obtained in the home, the weight (in grams) of that volume of liquid needs to be estimated using the information in Weights and measurements of foods (Form I-4.4) or Liquid densities for converting volume to weight (Form I-4.6).

Forms I-4.2, I-4.3, I-4.4, I-4.5 and I-4.6 in this Annex show examples of the information available on these types of lists. Completing the Identification of the general nutrition situation (Annex I-1), which should be carried out before the 24-hour Dietary Recall and Anthropometry, will help determine if these lists are available for foods consumed in your country or region.

#### 4. Calculation of net grams

To calculate the net grams of foods, follow these steps:

1. To obtain the net grams, start with the weight (in grams) of the food obtained during the home visit. If the weight information is not written on the *24-hour Dietary Recall and Anthropometry form*, it should be obtained from either Weights and measurements of foods (Form I-4.4), the back of any models/silhouettes/photos used, or by weighing a similar food in a community market or store.
2. Multiply the food weight by the conversion factor, if necessary. If the child consumed a cooked food and that food only appears in its raw form in the Food Composition Table, use the following formula:

**Raw net grams =**

Weight of food “X”

Edible portion (if “Weighed [1=gross, 2=net]” is equal to 1) x

Liquid densities (if “Weighed [1=gross, 2=net]” is equal to 1) x

Conversion from cooked to raw (if “Consumed [1=cooked, 2=raw]” is equal to 1)

If the child consumed a cooked food and that food appears in its cooked form in the Food Composition Table, it is not necessary to convert it to raw. Therefore, use this formula:

**Net grams =**

Weight of food (X)

Edible portion (if “Weighed [1=gross, 2=net]” is equal to 1) x

Liquid densities (if “Weighed [1=gross, 2=net]” is equal to 1)

Observe the following example with the edible portion (Exhibit L):

- The caregiver served the child a banana that weighed 116 g (with peel).
- According to the **ProPAN** Food Composition Table, the code for a raw banana is “70310” and the edible portion is 0.68 (in other words, when you have a banana with the peel, only 68% is consumed—the part without the peel). Accordingly, the following calculation is performed:  
 $116 \text{ g of banana (total weight)} \times 0.68 \text{ (edible portion of the banana)} = 78.8 \text{ g}$
- Write “078.8” in the box for amount “Served” (“Net grams”).
- As the child did not finish the banana and only ate 1/3 of it, then:  
 $78.8 \text{ g (edible portion of the banana)} \times 1/3 \text{ (amount the child ate)} = 26.3 \text{ g}$
- Write “026.3” in the box for amount “Consumed” (“Net grams”).

Observe the following example with the conversion from cooked to raw (Exhibit L):

- The caregiver served the child a piece of cooked turnip (bought in a cafeteria) that had an average weight of 43 g.
- According to the **ProPAN** Food Composition Table, the code for raw turnip is “80660.” According to the lists generated by the team, as described in Cooked-to-raw conversion factors (Form I-4.3), the conversion factor from cooked to raw is 1.17 (i.e., > 1, which means that it loses water when cooked). Based on this, the following calculations are made:  
 $43 \text{ g of turnip (cooked)} \times 1.17 \text{ (conversion from cooked to raw)} = 50.3 \text{ g}$
- Write “050.3” in the box for amount “Served” (“Net grams”).
- The child did not eat the entire turnip and only ate half of the food, hence:  
 $50.3 \text{ g (raw turnip)} \times 1/2 \text{ (amount consumed)} = 25.2 \text{ g}$
- Write “025.2” in the box for amount “Consumed” (“Net grams”).

Observe the following example with the conversion from liquid volume to grams (Exhibit L):

- The caregiver served the child 1 small cup (abbreviated as SmC, as agreed by research team) of apple juice (also bought in a cafeteria).
- In the office, the capacity of the small cup was estimated at 150 ml.
- According to the **ProPAN** Food Composition Table, the code for apple juice is “120130.” According to the lists generated by the team, apple juice’s density is 0.92 g/ml. This means that every 1 ml of apple juice weighs 0.92 g. Based on this, the following calculations are made:  
 $150 \text{ ml of apple juice} \times 0.92 \text{ g/ml (density)} = 138.0 \text{ g}$
- Write “138.0” in the box for amount “Served” (“Net grams”).
- The child only drank 1/4 of the cup of apple juice, hence:  
 $138.0 \text{ g (apple juice)} \times 1/4 \text{ (fraction consumed)} = 34.5 \text{ g}$
- Write “034.5” in the box for amount “Consumed” (“Net grams”).

**Exhibit L. Sample edible portion calculations (cooked to raw, volume to grams)**

Meal-time	Name of food or dish	Ingredients and characteristics	Code (Office)	Measurements taken in the home						Conversion to grams	Net Grams	
				Served	Not Consumed	Consumed	Weighed (1=gross 2=net)	How consumed (1=cooked 2=raw)	Times consumed in past week		Served	Consumed
10	Banana	Tabasco	70310	116 g	2/3	1/3	1	2	3	(116 g x 0.68) x 1/3	078.8	026.3
31	Turnip	Bought	80660	43 g	1/2	1/2	2	1	1	(43 g x 1.17) x 1/2	050.3	025.2
31	Apple juice	Bought	120130	SmC <sup>a</sup> (150 ml)	3/4	1/4	1	2	7	(150 ml x 0.92 g/ml) x 1/4	128.0	034.5

a SmC: small cup (household measure agreed upon by research team).

### To calculate net grams of dishes, use the following steps:

As dishes are served and consumed cooked, the ingredients need to be converted to their net cooked weight (i.e., into their edible and cooked form). By doing this, you can calculate how much of each cooked ingredient was served to the child. Then, if these ingredients are only available raw in the Food Composition Table, they are converted to raw (using the cooked to raw conversion factors).

1. In the lower part of the form, calculate the net cooked grams of the ingredients used in the dish. Use the food's edible portion and the cooked to raw conversion factor, if necessary (Exhibit M).

### Exhibit M. Sample application of cooked-to-raw conversion factor

Dish: Goose soup	Quantity used	Weighed (1=gross 2=net)	Used (1=cooked 2=raw)	Total weight of cooked ingredients: 2703.85 g	Cooked grams
Ingredients				Conversion to cooked	
Goose drumstick with bone	1 kg	1	2	1000 g x 0.45 x 1/1.23 = 365.85 g	365.9
Vegetable oil	30 g	2	2	30 g	030.0
White onion, large	2 (144 g each)	2	2	2 x 144 g = 288 g	288.0
Water	2 liters	2	2	2 x 1000 g = 2000 g	2000
Bouillon with tomato flavor	1 cube	2	2	15 g	015.0
Iodized salt	5 g	2	2	5 g	005.0

The goose drumstick with bone has an edible portion of 0.45. The cooked-to-raw conversion factor for this food is 1.23. Because the conversion being made is from raw to cooked, the inverse of the conversion factor (1/1.23) is used.

$$1000 \text{ g raw} \times 0.45 \text{ (edible portion)} \times 1/1.23 \\ \text{(inverse of cooked to raw conversion factor)} = 365.85 \text{ g cooked}$$

The oil used in the dish weighed 30 grams. The white onion did not have an inedible portion. Because there were two onions used, the weight of one (144 g) was multiplied by 2. Two liters of water are equivalent to two kilograms of water (because for water, 1 ml = 1 g). The weight of a bouillon cube was weighed in the office and determined to be 15 grams. No conversions were necessary for the iodized salt; its weight remained at 5 g.

2. To estimate how much of each ingredient was served cooked to the child (Exhibit M):

First, add up the cooked grams for all of the ingredients and write the sum in the space labeled “Total weight of cooked ingredients” in the lower part of the form. For example:

$$365.85 \text{ g} + 30 \text{ g} + 288 \text{ g} + 2000 \text{ g} + 15 \text{ g} + 5 \text{ g} = 2703.85 \text{ g}$$

Next, calculate what fraction each ingredient contributes to the dish. For example:

$$\text{Drumstick: } 365.85 \text{ g} / 2703.85 \text{ g} = 0.135$$

$$\text{Oil: } 30 \text{ g} / 2703.85 \text{ g} = 0.011$$

$$\text{Onion: } 288 \text{ g} / 2703.85 \text{ g} = 0.1065$$

$$\text{Water: } 2000 \text{ g} / 2703.85 \text{ g} = 0.7396$$

$$\text{Bouillon: } 15 \text{ g} / 2703.85 \text{ g} = 0.0055$$

$$\text{Salt: } 5 \text{ g} / 2703.85 \text{ g} = 0.0018$$

Next, calculate how many cooked grams of each ingredient were served to the child. We know that the child was served 80 g of the cooked dish and we use this information as follows (Note: the following calculation can only be done when the dish and its ingredients are in the same form, either both are in their raw form, or both are in their cooked form as in the example below):

$$\text{Drumstick: } 80 \text{ g cooked} \times 0.135 = 10.8 \text{ g cooked}$$

$$\text{Oil: } 80 \text{ g cooked} \times 0.011 = 0.88 \text{ g cooked}$$

$$\text{Onion: } 80 \text{ g cooked} \times 0.1065 = 8.52 \text{ g cooked}$$

$$\text{Water: } 80 \text{ g cooked} \times 0.7396 = 59.168 \text{ g cooked}$$

$$\text{Bouillon: } 80 \text{ g cooked} \times 0.0055 = 0.44 \text{ g cooked}$$

$$\text{Salt: } 80 \text{ g cooked} \times 0.0018 = 0.144 \text{ g cooked}$$

Another way to calculate these values is listed below:

$$\text{Drumstick: } \frac{365.85 \text{ g cooked}}{2703.85 \text{ g cooked}} = \frac{X \text{ g}}{80 \text{ g cooked}}$$

Solving for X: = 10.8 g cooked

*Note:* These calculation methods do not take into account how much water has evaporated during cooking the dish. Therefore, they will tend to overestimate the quantity of water consumed by the child and underestimate the quantity of other, solid, ingredients consumed.

If the ingredient is available in its cooked form in the Food Composition Table, go to the top part of the form and write in the cooked grams of the ingredient in the “Served”. Subtract the quantity not consumed and note the grams consumed in “Consumed,” under “Net grams.” Be sure to write the food code for the cooked form in Step 4, below.

3. To estimate how much of each ingredient, in its raw form, was served to the child (Exhibit N):

If the ingredient only appeared in its raw form in the Food Composition Table, you will need to convert the cooked quantity served (calculated in Step 2) to its raw form. In this example, none of the goose soup ingredients appeared in cooked form in the **ProPAN** software Food Composition Table. To convert to raw the amount of each ingredient served to the child, the cooked to raw conversion factor will be used. In this example, only the drumstick ingredient changes weight when cooked and its cooked to raw conversion factor is 1.23.

$$10.8 \text{ g cooked} \times 1.23 \text{ (cooked-to-raw conversion factor)} = 13.3 \text{ g raw}$$

For those ingredients that do not change weight when they are cooked, the cooked grams are considered equivalent to the raw grams.

Oil: 0.88 g raw

Onion: 8.52 g raw

Water: 59.168 g raw

Bouillon: 0.44 g raw

Salt: 0.144 g raw

In the top part of the form, write these grams in the column labeled “Amount in grams served.” Subtract the quantity not consumed and write the quantity consumed in “Amount in grams consumed” for each ingredient. Be sure to write the food code corresponding to the raw form in Step 4, below.

4. Write the food code that is listed in the **ProPAN** Food Composition Table, being careful to choose either the raw or cooked form based on the calculations done in Steps 2 and 3 above (Exhibit N). If the dish is separated into its ingredients, do not assign a code to the name of the dish in the column labeled “Code” (i.e., the row corresponding to the dish name, “goose soup,” should be blank in the “Code” column).

**Exhibit N. Sample calculation of net grams served and consumed by child for dishes whose ingredients needed to be broken down**

Meal-time	Name of food or dish	Ingredients and characteristics	Code (Office)	Measurements taken in the home						Conversion to grams	Net Grams	
				Served	Not Consumed	Consumed	Weighed (1=gross 2=net)	How consumed (1=cooked 2=raw)	Times consumed in past week		Served	Consumed
30	Goose soup			80 g	0	80 g						
30		Goose meat, raw	60910						1	365.85 g / 2703.85 g = 0.135 80 g x 0.135 = 10.8 g 10.8 g x 1.23 = 13.3 g	13.3	13.3
30		Vegetable oil	90501						1	30 g / 2703.85 g = 0.011 80 g x 0.011 = 0.88 g	0.9	0.9
30		White onion, large	800594						1	288 g / 2703.85 g = 0.1065 80 g x 0.1065 = 8.52 g	8.5	8.5
30		Water	120337						1	2000 g / 2703.85 g = 0.7396 80 g x 0.7396 = 59.168 g	59.2	59.2
30		Tomato paste	80647						1	15 g / 2703.85 g = 0.0055 80 g x 0.0055 = 0.44 g	0.4	0.4
30		Salt	130017						1	5 g / 2703.85 g = 0.0018 80 g x 0.0018 = 0.144 g	0.1	0.1

In summary, the following procedures should be performed in the office:

- Coding of mealtime and dishes and ingredients according to the “List of food codes” from the **Pro-PAN** software Food Composition Table
- Conversion of foods to net grams using the required conversion factors (Edible portions of foods, Cooked-to-raw conversion factors, and/or Liquid densities for converting volumes to weights).

If a code that does not correspond to the food is erroneously used, or there are errors in completing the calculations, the wrong energy and nutrient values will be obtained when analyzing this information.

Coding and calculations should be completed the same day as the survey is administered and the data given to the Supervisor for review.

### Edible portions of foods (Form I-4.2)

The edible portion of food refers to the portion of the food that can actually be eaten. This value is expressed as a decimal ranging from 0 (meaning no part of the food is edible) to 1.0 (meaning all parts of the food are edible), or a percentage ranging from 0% (no part of the food is edible) to 100% (all parts of the food is edible). For example, only 68% of a banana is edible (with the peel representing the remaining 32%), resulting in an edible factor of 68%.

#### Generating the edible factor

It will be necessary to generate the edible factors for foods consumed by children for which this information is not available.

To generate the edible factor of a particular food, the food should be weighed with the inedible portion (e.g., pit, bone, or peel) included. Then, all of the inedible portions should be removed and the food reweighed, measuring only the edible portion. The edible portion can then be calculated. An example is provided below.

Raw goose drumstick *with* skin and bone, 1 medium piece = 112 g

Raw goose drumstick *without* skin or bone, 1 medium piece = 73 g

If 112 g of goose drumstick including the skin and bone is 100%, what is the percentage of the goose drumstick without skin or bones (without the inedible portion) that weighs 73 g?

$$\frac{112 \text{ g goose drumstick with skin and bones}}{73 \text{ g goose drumstick without skin or bones} \times \text{edible portion}} = 100\%$$

The edible portion (X) = 65%

As 65% divided by 100 = 0.65, the edible portion of the raw goose drumstick is 0.65.

### Applying the edible factor to calculations

To apply the factor to calculations, the edible portion must first be obtained from the Edible portions of foods list generated by the country or the research team based on the information provided in [Form I-4.2](#). The served (or consumed) grams of the food or ingredient should then be multiplied by the edible portion. Examples are provided below.

75 g of pork *with bone*, with an edible portion of 0.66

$$75 \text{ g} \times 0.66 = 49.5 \text{ g pork without bones}$$

### Cooked-to-raw conversion factors (Form I-4.3)

To analyze the data generated in the *24-hour Dietary Recall and Anthropometry*, the weight of the foods (raw or cooked, in net grams) is needed. The weight of cooked foods versus raw weights varies considerably because some foods retain water (e.g., rice) while others lose water (e.g., meat) during the cooking process. It is important to consider these changes and use the conversion factors to calculate the net gram amounts for the raw or cooked food, as needed.

### Generating the conversion factor

To generate the conversion factor, the raw food must be weighed. The food is then cooked, using a common cooking method (e.g., boiling, frying, or grilling). The selected cooking method should be recorded. The cooked food should be cooled for a short, pre-determined amount of time (e.g., 5 minutes) and then weighed. The conversion factor should be calculated as follows:

Weight of raw rice: 85 g

Weight of cooked rice: 189 g

$$\frac{85 \text{ g}}{189 \text{ g}} = X$$

$$X = 0.45 \text{ (cooked-to-raw conversion factor)}$$

Exhibit O shows examples of cooked-to-raw conversion factors calculated in research conducted in Mexico.

### Exhibit O. Sample cooked-to-raw conversion factors

Food	Conversion factor
Boiled rice	0.45
Fried rice	0.30
Boiled beans	0.28
Refried beans	0.20
Boiled pasta	0.45
Fried beef	1.25

Source: Instituto Nacional de Salud Publica (INSP), Mexico, 1998.

**Applying the conversion factor to calculations**

The cooked-to-raw conversion factor can be used to convert a cooked food to its raw form, or vice versa. When converting from cooked to raw, the conversion factor is multiplied. When converting from raw to cook, the amount should be divided by the conversion factor (or multiplied by the inverse of the conversion factor). Examples are provided below.

*Cooked to raw: multiplying by the conversion factor*

82 g *boiled* beans x 0.28 (cooked-to-raw conversion factor) = 22.96 g *raw* beans, which can be rounded to 23.0 g

82 g *fried* beef x 1.25 (cooked-to-raw conversion factor) = 102.5 g *raw* beef

*Raw to cooked: multiplying by the inverse of the conversion factor*

30 g *raw* beans x 1/0.28 (inverse of the cooked-to-raw conversion factor) = 107.14 g *boiled* beans, which can be rounded to 107.1 g

100 g *raw* beef x 1/1.25 (inverse of the cooked-to-raw conversion factor) = 80 g *fried* beef

*Raw to cooked—dividing by the factor*

$$\frac{30 \text{ g raw beans}}{0.28 \text{ (factor)}} = 107.14 \text{ g boiled beans, which can be rounded to 107.1 g}$$

$$\frac{100 \text{ g raw beef}}{1.25 \text{ (factor)}} = 80 \text{ g fried beef}$$
**Weights and measurements of foods (Form I-4.4)**

This list is generated by obtaining the average weight of different sizes of foods available in the study communities. This is a useful tool for estimating the weights and measurements of foods that cannot be weighed in the home, and dishes for which the ingredients list cannot be obtained. To ensure Field Workers can accurately identify different sizes of the same food, a standardization exercise should be carried out until they accurately and repeatedly differentiate food sizes correctly. Supervisors should buy foods of different sizes (e.g., various small-, medium- and large-sized mangos) and the research team should designate sizes (“small,” “medium,” or “large”) for each one. They should then weigh each food sample, compute an average for each size, mix up the food samples, and ask the Field Workers to select one at random and identify its size. This activity can be completed while the foods, their sizes, and average weights are being defined for the [Market Survey \(Annex I-5\)](#).

The weights and measurements shown in Exhibit P are from research conducted in Bolivia. During field testing, silhouettes of commonly consumed foods were drawn and cut out. If the caregiver described the tomato she served the child as “small” but bigger than the silhouette for a “small” tomato provided by the research team, and not quite as large as the silhouette for a “medium” tomato, the maximum range of weight for the small tomato was used (84 g) rather than the average weight of the small tomato (77 g)

(Pachón and Reynoso, June 2002).

### Exhibit P. Sample weights and measurements of foods

Food	Size	Average weight (g)	Maximum and minimum range (g)
Bread, marraqueta <sup>a</sup>	1 unit	80	73–83
Bread, redondo <sup>b</sup>	1 unit	57	55–58
Celery	1 bunch	9.5	6–12
Chard, leaves and stalk	1 small bunch	22	20–25
Chard, leaves and stalk	1 medium bunch	32	31–39
Chard, leaves and stalk	1 large bunch	41	42–53
Flour	1 cup, level	130	–
Flour	1 cup, heaped	164	–
Peapods, fresh	1 handful	70	68–72
Sausage and beans	1 tsp	6.8	–
Sausage and beans	1 soup spoon	13.7	–
Sausage and beans	1 salsera spoon	27.5	–
Sausage and beans	1 pozolera spoon	20.6	–
Sausage and beans	1 small serving spoon	48.2	–
Sausage and beans	1 large serving spoon	62	–
Sugar, granulated	1 soup spoon, level	10	–
Sugar, granulated	1 soup spoon, heaped	18	–
Tomato	1 small unit	77	60–84
Tomato	1 medium unit	126	118–140
Tomato	1 large unit	157	147–172

Source: Research carried out in Bolivia, Helena Pachón, Rollins School of Public Health, Emory University, personal communication.

a South American crunchy bread made with flour, salt, water and leavening. It is mostly eaten in Chile, Bolivia and Peru.

b South American bread.

### Abbreviations of household measures (Form I-4.5)

The list of abbreviations of household measures helps to identify the utensils that caregivers use to offer foods to children in case the amounts served cannot be weighed in the home. All Field Workers must use the same abbreviations when referring to a specific utensil.

#### Generating the list

Before creating the list, a set of the most common utensils used in the area must be obtained. Ideally, the Field Workers should decide on the best way to abbreviate and remember each utensil. The abbreviations should be created for optimum comprehension by the Field Workers and the Supervisor. Examples from Mexico (INSP, 1998) are shown in Exhibit Q.

**Exhibit Q. Sample abbreviations of household measures**

Utensils	Abbreviation
Cup	C
Serving spoon, small	Sess <sup>a</sup>
Serving spoon, large	Sesl <sup>b</sup>
Teaspoon	Tsp
Tablespoon	Tbsp

Source: Research carried out in Mexico (INSP; 1998).

a Sess: small serving spoon (household measure agreed upon by research team).

b Sesl: large serving spoon (household measure agreed upon by research team).

**Liquid densities for converting volume to weight (Form I-4.6)**

The densities of liquids are used to convert volumes (expressed in milliliters) to weight (expressed in grams). The densities represent the number of grams in 1 ml of the liquid. These values are used when it is not possible to weigh the liquid in the home, or if the weight of the liquid in the utensil or container in which it was served to the child does not appear in Weights and measurements of foods (Form I-4.4). Exhibit R shows some examples from Mexico.

**Exhibit R. Sample liquid densities for converting volume to weight**

Liquid	Density (g/ml)
Bean broth	0.64
Beer	0.90
Condensed milk	1.65
Diet colas	0.82
Ginger ale	0.82
Heavy cream	1.13
Honey	1.70
Maple syrup	1.40
Mineral water	0.82
Oil, cottonseed	0.91
Oil, coconut	0.91
Oil, sunflower	0.91
Oil, olive	0.91
Tomato juice	1.38

Source: INSP, Mexico, 1998.

**Calculating density values**

Density values are calculated by weighing a known volume of a liquid and dividing the weight (in grams) by that volume (in milliliters). For example, if the measured volume of a liquid is 10 ml, its weight in grams is divided by 10 to yield density per 1 ml (g/ml). Examples are provided below.

- 5 ml of olive oil weighing 4.55 g

$$\frac{4.55 \text{ g}}{5 \text{ ml}} = \frac{X \text{ g}}{1 \text{ ml}}$$

$$X = 4.55 \text{ g} / 5 \text{ ml} = 0.91 \text{ g/ml}$$

- 10 ml of honey weighing 17.0 g

$$\frac{17.0 \text{ g}}{10 \text{ ml}} = \frac{X \text{ g}}{1 \text{ ml}}$$

$$X = 17.0 \text{ g} / 10 \text{ ml} = 1.70 \text{ g/ml}$$

**Applying densities to calculations**

If only the volume of the liquid is known (not the weight), and the density value is available from a country list (or one generated by the research team), the liquid's density can be multiplied by the volume to generate the weight (in grams). Examples are provided below.

- 15 ml of olive oil

$$15 \text{ ml} \times 0.91 \text{ g/ml (density)} = 13.65 \text{ g}$$

- 25 ml of honey

$$25 \text{ ml} \times 1.70 \text{ g/ml (density)} = 42.5 \text{ g}$$

**Instructions for familiarization with local foods and dishes**

When conducting the *24-hour Dietary Recall and Anthropometry*, Field Workers should be as familiar as possible with the foods that caregivers are likely to report. This will ensure they are well prepared to probe caregivers for further information about food intake in order to obtain the most accurate data. The steps below can be incorporated into the Office Work phase to help Field Workers prepare for *24-hour Dietary Recall and Anthropometry* data collection.

1. Consult with community leaders to determine commonly consumed foods and dishes and commonly used household measures. Purchase the reported foods and ingredients for these dishes along with everyday items people use to measure foods and liquids ("household measures"), such as measuring cups.

2. Look up the reported foods and ingredients in the **ProPAN** Food Composition Table and note whether they are listed as raw, cooked, or both.
3. For foods not listed in the **ProPAN** table, see if another food composition table for the country includes that food. If it is a processed food, look for nutrition facts labeling on the package and/or contact the manufacturer for nutrient composition. Add the new composition data to the **ProPAN** table (see the software manual for instructions).
4. Continue making the customized version of Edible portions of foods (Form I-4.2).
5. Continue making the customized version of Cooked-to-raw conversion factors (Form I-4.3).
6. Enlist one or two contacts in the community to make the common dishes (listing all ingredients and their measurements). Measure all raw food ingredients and cooked food (the separable ingredients, and the whole dish, as done in determining the Cooked-to-raw conversion factors).
7. Enter the recipes into the Food Composition Table in the **ProPAN** software (see the Software User's Guide for instructions). For the ingredients measurements, determine/use an average based on the 2 or 3 recipes prepared by the community members. Enter the average dish as a food item in the Food Composition Table.
8. While continuing to create the list of Weights and measurements of foods (Form I-4.4) carry out the following tasks:
  - a. Begin planning the strategy for measuring foods in the home (use of food models, pictures, silhouettes, samples, etc.).
  - b. Discuss the recipes and note which ones have separable ingredients that can be quantified alone (e.g., pieces of fish, meat, or potatoes often found in stews).
9. Continue making the customized versions of Abbreviations of household measures (Form I-4.5) and Liquid densities for converting volume to weight (Form I-4.6).

## Annex I-5: Market Survey

### Objectives

- Identify the locally available foods that provide the greatest amount of energy and nutrients for the least cost (nutrient/cost ratio)
- Determine the seasonality and availability of specific foods
- Obtain information that will be used to develop the Key Foods List
- Generate data that can be used as inputs for WHO's *Optifood* software program

### Products

- Ranked lists of local foods that provide the greatest amount of energy and nutrients (protein, iron, zinc, vitamin A, vitamin C, and calcium) for the least cost
- Calendar listing months of year in which key foods can be found locally
- Inputs for generating the *Key Foods List*
- Inputs for WHO's *Optifood* software program

### Steps

#### 1. Preparation and planning

Based on the results of the *24-hour Dietary Recall and Anthropometry*, and discussions with community leaders, a list of foods should be compiled from the various food groups normally used to feed children 6.0–23.9 months old (e.g., cereals, legumes, tubers, fruits, vegetables, meats, eggs, fish, dairy products, processed or “ready-to-eat” products, and fats and oils). The list should include a few foods from each food group. The selection of foods should favor those sold in easily accessible retail locations with a high nutritional value and that can potentially be consumed by the target age group (6.0–23.9 months) but are not usually consumed by children in the study communities (according to the results of the *24-hour Dietary Recall and Anthropometry* or other information). The list should contain no more than 100 foods.

Next, the average weight for any foods on the list not available locally as 1 kg or 1 L retail units should be calculated. For example, the weight or volume of “bunches,” “packets,” “handfuls,” and “scoops” should be converted to a standard metric system unit. At least five samples (from different retail locations) should be weighed for each unit of interest (e.g., “small,” “medium,” and “large”). For example, to determine the average weight for a “bunch” of parsley, 5 small, 5 medium, and 5 large “bunches” of parsley (purchased at different grocery stores or markets) should be weighed. All weights should be calculated in grams. For processed or “ready-to-eat” products, use the number of grams for each unit of interest indicated on the package labeling (e.g., if the smallest size can of tuna has a weight of “135 g,” use that number as the

weight of a “small” serving of tuna). This type of data can be gathered while collecting information about food prices and availability at local retail establishments that sell food.

For any food item on the list with inedible portions (e.g., bone, peel, skin, or seeds), the edible portion (per retail unit) must also be calculated, based on the average weight and the edible portion factor (as explained in [Edible Portion of Foods \(Form I-4.2\)](#)). For example, in a community in El Alto in Bolivia where **ProPAN** was tested, the retail unit for kale included the stem (Pachón and Reynoso, June 2002). One large stem of kale has an average weight of 28 g and (according to the **ProPAN** Food Composition Table) an edible portion of 0.85. To determine the amount of edible grams for the retail unit (a large stem of kale), weight in grams (28 g) was multiplied by the edible portion factor ( $28 \times 0.85 = 23.8$  g). As shown in the example of a completed [Market Survey Form \(Form I-5.1\)](#), the edible portion should be written (in grams) under the column labeled “Net weight,” on the same row as the food code, food name, and retail unit.

All food items for which information on price and availability are collected must be identified based on their key characteristics (e.g., “loose” or “packaged” rice). For processed food products, each item should be identified by brand name. This information should be written on the *Market Survey Form* under the column labeled “Name of key food.”

Field Workers should be trained in the proper identification and recognition of all foods listed in the column labeled “Name of key food” and should practice differentiating between the various retail units (e.g., “1 kg” versus “1 L”). These practice sessions should be carried out initially at the office and later in the retail locations.

## **2. Selection of participants**

Identify the retail locations (e.g., markets, grocery stores, and mobile kiosks) most frequently visited by caregivers or other family members. Information about retail locations can be obtained from the responses to the last question of the *Caregiver Survey*, or by talking with community leaders.

From those locations, at least five should be selected for data collection. The selection should be based on factors such as diversity of products available and caregiver preference. Different types of retail locations should be included in the sample to obtain the best representation of food availability and prices. If the location is a market, information on prices should be obtained from three different stalls.

## **3. Materials**

- One copy of the *Market Survey Form* (Form I-5.1) for each retail location selected, with prefilled data for the food code, the food name, the retail unit, and net weight
- Food scale (if food items will be weighed when collecting data on prices)
- Pencils/pens
- Clipboard
- Identification cards for staff

#### 4. Personnel and time

The time required to complete one Market Survey (per retail location) is approximately 2 hours. One Field Worker should be assigned to each selected retail location.

#### 5. Description and procedures

If the survey location is a retail operation like a grocery store or a supermarket, only one price per food item should be collected. If the survey location is a market with multiple vendors, three different prices per food item should be collected, and an attempt should be made to include both the highest and lowest prices across all vendors. For each completed Market Survey Form, the **ProPAN** software will allow the entry of up to three prices per food item for each retail location.

#### 6. Analysis

Price and its relation to energy and nutrient content

Using data obtained in the Market Survey as inputs, the **ProPAN** software program generates the following outputs:

1. Average price per gram for each food item
2. Average price per 100 g of each food item (this output can be used as an input in the WHO *Optifood* software program)
3. Energy and nutrients (protein, iron, zinc, vitamin A, vitamin C, and calcium) per unit of local currency.<sup>16</sup>

#### Seasonality

A calendar should be hand-drawn to indicate seasonality for all selected foods (the months of the year they are available in the community). Exhibit S shows an example from Bolivia.

**Exhibit S. Sample calendar indicating seasonality of selected foods**

Food	All year	J	F	M	A	M	J	J	A	S	O	N	D
Turnip	X												
Okra				X	X	X	X	X	X	X			
Papaliza (type of potato)					X	X	X	X	X	X			
Papaya			X	X	X	X	X	X	X	X			

Source: Research carried out in Bolivia (Pachón and Reynoso, June 2002).

#### Key Foods List

The information generated here for the selected foods can be used to generate the Key Foods List (Annex I-6), based on an analysis done by hand using the Matrix for selecting key foods (Form I-6.2).

<sup>16</sup> For example, in Bolivia, 1 *Boliviano* procured 85.5 mg of iron in *pasankalla* (caramelised puffed corn), 72.6 mg of iron in dried lima beans, and 71.4 mg of iron in lentils (Pachón and Reynoso, 2002).

### **Market Survey Guide (for Form I-5.1)**

The Market Survey Form is divided into the following sections:

#### **Identification**

This section collects the following data:

- Name of retail location where information on price and seasonality is obtained, including the specific location (the exact address, including district and area or city)
- Field Worker code assigned by the Supervisor (one unique code per Field Worker)
- Date of the visit to the retail location (dd/mm/yyyy).

All information for this section of the completed form should be verified by the Supervisor. He/she should confirm the data have been verified by writing his/her code on the form and the date it was reviewed.

#### **Food code**

The food codes written in the first column of the form are obtained from the **ProPAN** Food Composition Table and are the same ones used in the **ProPAN** software analysis option Analysis of food item energy and nutrients. To save time, the food code fields can be filled in by the Supervisor during preparation of the list of selected foods.

#### **Food name**

This section should include the full name of each food item plus the key characteristics or brand name (e.g., “Red Delicious apple”) to enable its proper identification during data collection on food prices at the retail locations. Only the prices for the exact food item specified (“Red Delicious apple”) should be collected. The key characteristics are determined by the research team before the visits to the retail locations and are written down by the Supervisor on each form. In the case of processed foods, the brand names should be included.

#### **Retail unit**

The third column on the form refers to the retail unit of the food. For example, for foods sold by kilogram, the retail unit will be “kilogram” and prices will be obtained for 1 kg of the food item. For foods sold in other units of measure (e.g., bags, bottles and cans), the size of the unit will need to be specified. If the food is sold in more than one unit of measure, all of them must be listed (in a separate row on the form). Food prices should be recorded by retail unit to reduce errors in data analysis and interpretation. The food price column should be completed by the Supervisor.

#### **Net weight**

The net weight of the food’s retail unit should be recorded in the fourth column of the form. As described earlier, net weight is the weight of the edible portion of the retail unit, (i.e., the weight of the food item without peel, bone, seeds, or other non-edible portions). This column should be completed by the Supervisor.

### **Price**

Up to three prices in local currency should be recorded, per retail location for each food item if the location is a market with several vending stalls. Otherwise, only one price should be collected per retail location for each food item.

The price should be written in local currency. Decimal points should be clearly written. For example, if the cost of a kilogram of mangoes is 8.20 dirham (Moroccan currency), “8.20” should be written in the price column. This information should be completed by the Field Worker during the visit to the selected retail locations.

### **Seasonality**

Information on seasonality should only be collected for foods such as fruits and vegetables that are not available in local retail locations year-round. Write an “x” under the months in which the food is available (even if only a small amount is available). If the food is available all year long, write an “x” under the “All year” column. Note that this seasonality variable only considers the months in which the foods are available at the local retail locations (not the months in which the foods are sold in greatest quantities).

# Market Survey

2. Address/location: \_\_\_\_\_

Supervisor name: \_\_\_\_\_

5. Supervisor's code: \_\_\_\_\_

6. Supervision date: \_\_\_\_/\_\_\_\_/\_\_\_\_

[illegible]

## Annex I-6: Key Foods List

### Objectives

- Define the foods most frequently consumed by children 6.0–23.9 months old in the target population
- Identify foods that will be potentially important to promote in an intervention

### Product

- List of 25–30 key foods, including those produced in the home, gathered in the wild, or purchased in the commercial sector, with a focus on those that are nutrient-rich, enriched, or fortified. The list should include energy-rich, animal-source foods that are good sources of protein and/or micronutrients (iron, zinc, vitamin A, vitamin C, and calcium) and other foods considered potentially important in terms of nutrition. Low-nutrient foods and those that only provide energy should not be included. The list will be used in the Food Attributes Exercise.

### Steps

#### 1. Analyze the data and list key foods and their seasonality

Analyze the data of the *24-hour Dietary Recall and Anthropometry* by hand or using the **ProPAN** software (choosing the analysis option “Most frequently consumed foods”). Using the Key Foods List (Form I-6.1), list the foods most frequently consumed by young children (in descending order). Then, based on the Market Survey results, write the month(s) when the foods are available.

#### 2. List key foods appropriate for young children

Based on the *Market Survey* results, add the foods sold in the study area that are not frequently consumed by children but have a high energy or nutrient value at a low cost. These values can be obtained by using the **ProPAN** software analysis option Energy and nutrients in food per cost.

#### 3. Complete the key foods matrix (Form I-6.2)

To complete the form, write the selected foods for each of three categories (“highly consumed,” “nutrient-rich,” and “fat-rich”) in the first column. In the second column, add the reason(s) that the food was chosen. For example, specify if the food is frequently consumed (or not), its seasonality (if any), and if it is a food with good potential for an intervention (due to its energy or nutrient content in relation to cost). An example from Mexico is shown below in Exhibit T.

**Exhibit T. Sample matrix listing selected key foods and selection criteria  
(consumption frequency, seasonality, energy/nutrient content)**

Frequently consumed foods	Reason for choosing
1. Tortilla	Frequently mentioned, provides energy
2. Potato	Provides energy Available in the market and can be bought in small amounts (1/2 kg)
Nutrient-rich foods not mentioned above	Reason for choosing
1. Orange	Frequently mentioned Inexpensive and available in winter Produced at the home level Good source of vitamin C
2. Yogurt	Frequently mentioned and good source of calcium
3. Carrot	Not mentioned often but inexpensive and available all year Good source of vitamin A
Fat-rich foods not mentioned above	Reason for choosing
1. Oil	Frequently mentioned and used in most dishes Inexpensive and good source of fat and energy

#### 4. Create the Key Foods List

Complete [Form I-6.1](#) to create the *Key Foods List*. The list should include about 25–30 foods. Select the foods with the following traits:

- Frequently mentioned in the *24-hour Dietary Recall and Anthropometry*
- Low frequency in the *24-hour Dietary Recall and Anthropometry* but good source of micronutrients, protein, and energy, with the potential to be used in dishes for children
- High energy or nutrient value for a low cost
- Grown or produced in the home.

#### 5. Create visual aids

Once the *Key Foods List* has been developed, create cards, pictures (photos or drawings), or models of each food for use in the *Food Attributes Exercise* (Annex I-9).

### Key foods list (Form I-6.1)

[illegible]

**Matrix for selecting key foods (Form I-6.2)**

Frequently consumed foods	Reasons for choosing
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
Nutrient-rich foods not mentioned above	Reasons for choosing
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	

Fat-rich foods not mentioned above	Reasons for choosing
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
Observations _____	
_____	
_____	
_____	

## Annex I-7: Opportunistic Observations

### Objectives

- Identify the context of feeding behaviors and observe the interaction between the caregiver and child during the child's mealtime
- Assess the caregiver's feeding style and identify facilitators of and barriers to the ideal practice of responsive feeding
- Observe other aspects of food preparation and feeding (e.g., hygiene and the use of bottles, spoons, and other utensils)

### Product

- List of facilitators of and barriers to the ideal practice of responsive feeding

### Steps and logistics

#### 1. Preparation and planning

The Field Worker should be trained in making opportunistic or casual observations (see Step 4 below, and the *Opportunistic Observations Guide*) and filling out the *Opportunistic Observations Form* (Form I-7.1). Other than this training, using the Opportunistic Observations methodology does not require any specific work experience or skills. The Field Worker should always carry the observation guide with her/him and be prepared to observe any feeding episode during travel to and from the community, home visits, and visits to non-household locations in the community where caregivers may be feeding children (e.g., health centers).

#### 2. Selection of participants

An opportunistic observation of infant and young child breastfeeding and complementary feeding practices can occur at any time. The Field Worker should discretely observe caregivers and children under 2 years old during home visits, walks around the community, visits to markets or stores, and anywhere he/she sees a child breastfeeding, eating, or being offered food.

The Opportunistic Observations sample should include about 15 feeding episodes, with each one involving a different caregiver-child pair. From these, at least five of the 15 observations should involve consumption of a complete meal. The children in the caregiver-child pairs should be distributed across three age groups under the age of 2 years (0–5.9, 6.0–11.9, and 12.0–23.9 months).

The sample does not have to be randomly selected and can be composed of caregivers who already participated in the application of other research instruments. It is suggested that the sampling be purposive, and that the research team define the criteria for selecting the caregivers (e.g., caregivers with a child in the target age group; caregivers who are community leaders, volunteers, vendors, etc.)

### **3. Materials**

- Copies of the Opportunistic Observations Form (Form I-7.1)
- One copy of the Opportunistic Observations Guide (for Form I-7.1)
- Notebook
- Pencils/pens
- Clipboard
- Identification card

### **4. Required personnel and time frame**

All Field Workers should be trained to carry out Opportunistic Observations. The training should cover the following basic elements:

- What constitutes events, activities, and behaviors of interest (to avoid observations about irrelevant or trivial details)
- The need to pay careful attention to the sequence of activities observed during the child's mealtime
- The need for use of terminology that describes what was observed but does not interpret it (thus the importance of ensuring that Field Workers can distinguish between a description and an interpretation)

Completing one opportunistic observation could take from 15 minutes to one hour or more, depending on the feeding practice being observed.

### **5. Description and procedures**

#### **In-home observations**

Ideally, the Field Worker will observe a main meal (breakfast, lunch, or dinner), beginning with food preparation and ending when the child finishes eating. If possible, in terms of timing, observation of a main meal can be done when the Field Worker visits the caregiver to conduct the Semi-structured Interviews or the Food Attributes Exercise. If that is not possible, the Field Worker should ask the caregiver when the child has his/her main meals and if it would be possible to visit the household again at one of those times. With the consent of the caregiver the Field Worker should then return to the home at one of the times specified and try to observe a main meal.

When making opportunistic observations the Field Worker should always maintain a neutral and cordial attitude, pay attention to specific situations or behaviors that may affect child feeding, and not intervene in the behaviors that are being observed. It is important to try to minimize disruption of the caregiver or family's daily activities.

### Non-household observations

When the observation is completed outside the home (e.g., on a bus route, in the market, or at a playground) and the caregiver is not aware that she is being observed, the Field Worker must be as unobtrusive as possible to avoid disrupting or altering the behaviors of the caregiver and/or the child.

### 6. Analysis

The analysis should be done by hand using the Matrix for summarizing Opportunistic Observations (Form I-7.2). In any observation of an ideal practice (see Table 1 in the Introduction), specify which ideal practice was observed and note any factors that may have facilitated or acted as barriers to the ideal practice, as shown in Exhibit U below. Examples of facilitators and barriers can be found in Table 3 of Module I and in the Glossary entries for these terms.

**Exhibit U. Sample matrix summarizing Opportunistic Observations about facilitators of/barriers to ideal practices**

Ideal practice	Actual practice	Barriers	Facilitators
11. All infants and young children 6.0–23.9 months old fed by a caregiver responsive to child	Most of the children did not receive support and were not motivated to eat	Children being fed in their caregivers' market stands Caregivers distracted with clients or other people	Two people available to feed the child

Source: Research carried out in Bolivia (Pachón and Reynoso, June 2002).

### ***Opportunistic Observations Guide (for Form I-7.1)***

When the Field Worker is in the community and observes a young child being fed, he/she should write all that he/she observes on the Opportunistic Observations Form (Form I-7.1). It is possible that not all the key behaviors regarding breastfeeding and complementary feeding will be observed in a single caregiver-child pair. However, it is important that as much information as possible is recorded each time the Field Worker has a chance to observe a breastfeeding or feeding episode.

#### ***I. Identification***

- Date of observation (dd/mm/yyyy)
- Field Worker's name
- First and last name of the child being observed (if possible to obtain)
- Brief description of the place (e.g., home, market, park, public transportation, etc.)
- Child's approximate age (in months)
- Child's sex
- Approximate age of the person feeding the child
- Sex of the person feeding the child
- Meal observed (e.g., breakfast, lunch, dinner; morning, afternoon, or evening snack)

#### ***II. Breastfeeding***

Record if at any time during the observation the caregiver breastfed the child. Observe and record the interaction between the caregiver and the child during the breastfeeding episode. Note if the caregiver pays attention to the child, if she lets the child breastfeed to satiety, and if breastfeeding happens smoothly or difficulties are observed (e.g., the child starts crying while breastfeeding).

#### ***III. Complementary feeding***

During the mealtime:

- Observe and record what the caregiver does when the food is served. For example, does the caregiver wash the child's hands? Record if the child eats by her/himself or with other family members, and specify who these family members are, if possible. If several people are eating at the same time as the child, whom does the caregiver serve first? Does anyone help the caregiver serve the food to the child?
- Note to what extent the child feeds himself/herself (i.e., is self-fed) during the mealtime, and to what extent the child is fed by the caregiver.
- Record if the child is served food on his/her own plate, and whether a spoon, a bottle, or other utensil is used to feed the child.
- Record the location of the child in relation to the caregiver (e.g., seated next to the caregiver, in the caregiver's arms, or on the floor away from the caregiver) during most of the feeding episode. Note if the caregiver is near the child and attentive, or if the caregiver is further away or doing something else.
- Write the name of all the foods, dishes, and drinks the caregiver serves the child.

If the observation is conducted during a family meal:

- Record if the caregiver serves any food, dish, or drink to the child that she does not serve to the rest of the family.
- Record if the caregiver serves to the child only a portion of a food, dish, or drink that she serves to the rest of the family. For example, from a stew for the family, she serves only the broth to the child, or she selects a potato from the family dish and mashes it for the child to eat. Record the name of the food, dish, or drink from which the caregiver selects a special portion for the child.
- Record if the caregiver serves any food, dish, or drink to the rest of the family that she does not serve to the child. Write the name of the food, dish, or drink the caregiver serves to the rest of the family but not to the child.

### Caregiver-child interaction

- Record if the caregiver ever *verbally encourages* the child to eat. Note the difference between “encourage,” which is done with a pleasant and positive tone of voice, and “hurry, threaten, or order,” which is done with a scolding or threatening tone of voice. Observe and record all verbal and non-verbal interactions between the caregiver and the child.
- Record if the caregiver encourages the child while she is eating well (i.e., the child is not rejecting the food, refusing to eat, or is playing with the food) or if she only encourages the child when she is not eating well. Record what the caregiver does.
- Observe and record if the caregiver ever *encourages* the child to eat more using *gestures* or *games* or by *demonstrating* how to do so (e.g., caregiver uses the child’s spoon to feed a spoonful to herself from the child’s plate, pretends the child’s spoon is a plane full of food “flying” to the child’s mouth, etc.). Record the strategies the caregiver uses. In case the caregiver does not encourage the child, make sure to record if this is because the child is eating well, or because the caregiver does not pay enough attention to the child, even though the child might need it.
- Record if the caregiver ever *physically forces* the child to eat during the mealtime. Record if the caregiver touches the child in any way that forces him/her to eat (e.g., opening the child’s mouth with a spoon full of food, pulling the child’s hair, or hitting the child).
- Observe and record if, at any time during the mealtime, the *child refuses to eat*. Note what the caregiver does in response.
- Observe and record if, during the mealtime, the caregiver serves more food to the child in addition to what was originally served, whether the same food/dish or a different food/dish.
- Observe and record if the child eats all the food that was served. If not, record what the caregiver does with the leftovers (e.g., puts them away for later use, throws them away or gives them to another family member).
- Record what the caregiver does during most of the time the child is eating. Is she doing something else without paying attention to the child? Is she doing something else but also paying attention to the child? Does she dedicate most of her time and attention to the child while the child is eating?
- Record other aspects related to the feeding time that seem important and note if any other forms were applied simultaneously.
- Make general observations about hygiene with regard to food preparation.

### Opportunistic Observations Form (Form I-7.1)

It is possible to observe all key elements of breastfeeding and complementary feeding in a single caregiver-child pair or in a single observation. However, Field Workers should refer to the key data items below nonetheless whenever it is possible to observe the feeding of a child under 2 years old, recording as much data as possible.

Topic	Observation
<b>I. Identification</b>	
Date of observation (dd/mm/yyyy): _____	
Name of Field Worker: _____	
First and last name of child being observed (if possible to obtain): _____	
Place of observation (home, market, park, etc.): _____	
Child's age in months (even if only an approximation): _____	
Child's sex: M ( ) F ( )	
Age of person feeding child (even if only an approximation): _____	
Sex of person feeding child: M ( ) F ( )	
Mealtime observed (e.g., breakfast, lunch, dinner or snack): _____	
<b>II. Breastfeeding</b>	
1. Caregiver-child interaction: _____	
• Does the caregiver pay attention to the child? _____	
• Is the child breastfed to satiety? _____	
• Are any difficulties observed? [If so, describe below.] _____	
_____	
_____	
_____	
_____	
<b>III. Complementary feeding</b>	
During mealtime	
1. When serving the food, does the caregiver:	
• Wash the child's hands? Yes ( ) No ( )	
• Serve the child first? Yes ( ) No ( )	
2. Child eats: by himself/herself ( ) with family members ( )	

Topic	Observation
3. How is the child fed during the mealtime? • The child feeds self without help from caregiver ( ) • The child mostly feeds self but receives help from caregiver ( ) • The child is fed mostly by caregiver but sometimes feeds self ( ) • The child is fed only by caregiver (i.e., child does not touch food or utensils). ( )	
4. Is the child served food on his/her own plate? _____ _____ Is a spoon, bottle, or other utensil used to feed the child? _____ _____	
5. What is the location of caregiver in relation to child? _____ _____ • Caregiver is near the child and attentive ( ) • Caregiver is not near the child and/or busy with another activity ( )	
6. Foods, dishes, and drinks served to child: _____ _____	
7. Are any foods, dishes, or drinks served only to the child (not to other members of the family)? If so, which types of foods, dishes, or drinks? _____ _____	
8. Is the child only served portions of the foods, or drinks that are served to the rest of the family, or are some foods or drinks prepared specially for the child? _____ _____	
9. Are any foods or drinks served only to the rest of the family (not to the child)? _____ _____	
<b>Caregiver-child interaction</b>	
10. Does the caregiver talk to the child, verbally encouraging him/her to eat? What does the caregiver say? _____ _____	
11. Does the caregiver encourage the child when he/she is eating well? What does the caregiver do or say? _____ _____	
12. Does the caregiver ever motivate the child to eat more using gestures or games, or by demonstrating to her/him how to eat? _____ What strategies does the caregiver use? _____ _____	
13. Does the caregiver ever physically force the child to eat during the meal? _____ _____	

Topic	Observation
14. During the meal, does the child ever refuse the food? _____ What does the caregiver do? _____	
15. Does the caregiver ever serve additional portions to the child during the meal? _____	
16. Does the child eat all of the food he/she is served? _____ What does the caregiver do with any leftovers? _____	
17. How does the caregiver spend her time while the child is eating? _____	
18. Other aspects related to the feeding: _____	
19. General observations about hygiene during food preparation or handling: _____	

## Matrix for summarizing Opportunistic Observations (Form I-7.2)

[illegible]

## Annex I-8: Semi-structured Interviews

### Objectives

- Identify current breastfeeding and complementary feeding practices
- Understand the reasons behind these practices
- Identify facilitators of and barriers to each ideal breastfeeding and complementary feeding practice
- Identify practices that could potentially be improved so that caregiver practices more closely resemble ideal practices

### Products

- Summary of current breastfeeding and complementary practices
- Summary of facilitators of and barriers to each ideal practice for breastfeeding and complementary feeding

### Steps

#### 1. Preparation and planning

The *Semi-structured Interviews Guide* (Form I-8.1) should be modified to suit the local context. For example, the suggested questions should be reviewed and adapted using local terminology. All questions should be formulated in such a way that the caregivers feel willing to answer them instead of pressured or offended by them. A pilot study should be carried out to test any changes that are made to the questions in the Guide.

#### 2. Selection of participants

Approximately 15 caregivers with children 0–23.9 months old should be interviewed. An effort should be made to include approximately five children per age group (0–5.9, 6–11.9, and 12–23.9 months) in the sample. The sample does not have to be randomly selected and can be composed of caregivers who have participated in the application of other research instruments. Sampling should be purposive and the research team should define the selection criteria (e.g., “caregivers with children in the target age group,” “caregivers who are community leaders, volunteers, vendors,” etc.).

#### 3. Materials

- One copy of the *Semi-structured Interviews Guide* (Form I-8.1), adapted to the local language
- Notebook (for recording participants’ responses, and other notes)
- Pencils/pens
- Clipboard
- Identification card

#### 4. Required personnel and time frame

If possible, the interviews should be conducted by Field Workers with knowledge of qualitative methods and nutrition, as they should 1) be familiar with the techniques required to carry out informative interviews and 2) have the nutritional background needed to identify which topics need follow-up questions. If no one on the research team has these skills, a Nutritionist trained in the use of qualitative methodology should carry out all interviews. Knowledge of qualitative methods is desirable so that the questions can be adapted as needed. For example, based on fieldwork conducted in Malawi,<sup>17</sup> some caregivers found it difficult to respond to hypothetical questions. In this type of situation the interviewers would need qualitative interviewing skills to adapt the questions as needed and/or explore different approaches (e.g., the use of multiple probe questions) to elicit the information being sought and collect the desired data.

#### 5. Description and procedures

*Semi-structured Interviews* are not surveys per se but rather informal conversations in which the participants should feel comfortable enough to share information about the topics of interest. Therefore, the *Semi-structured Interviews Guide* is designed mainly as a conversation guide. Rather than being posed verbatim as they would be in a survey, the questions in the *Guide* should be adapted to suit the context of each conversation and participant. Field Workers should be familiar enough with the subject matter and the questions to be able to spontaneously adjust the wording to match the age group of the child (as needed) to ensure the conversation proceeds in the most fluid and natural way possible.

Although some background information about the participant should be obtained, questions should not be asked directly and abruptly.

If an answer to any question appears to contradict any answers given to a previous question, the causes of the apparent contradiction should be clarified with the participant before proceeding to a new question.

All information obtained in the interview should be recorded in a notebook and all notes reviewed at the end of the day while the information is “fresh” in the interviewer’s mind. In the review, all handwriting should be checked for legibility and notes should be expanded by filling in any gaps in the information and/or adding comments about any relevant issues that were observed. If any of the information about any of the topics is unsatisfactory, the interviewer should list the gaps or contradictions and try to interview the caregiver a second time to discuss and clarify them.

#### 6. Analysis

The analysis should be done by hand using the two matrices provided: the Matrix for summarizing caregiver reasons for current practices and knowledge/attitudes about ideal practices (Form I-8.2) and the Matrix for summarizing facilitators of/barriers to ideal practices (Form I-8.3). Both matrices should be filled out using the ideal practices described in Table 1 in the Introduction as a reference point. Form I-8.2 should be filled out first for each participant. Then, for each ideal practice, Form I-8.3 should be completed using the information collected in the first matrix. Examples of barriers and facilitators can be found in Table 3 of Module I and in the Glossary entries for those terms.

<sup>17</sup> Janet Irene Picado, Nutrition Consultant, personal communication.

Form I-8.2 should be completed as follows:

- Ideal practice

In the top part of the form, specify the ideal practice based on the descriptions provided in Table 1 in the Introduction.

- Current practice

This column should include a description of the caregiver's current feeding practices. Direct quotes from the Caregiver Survey can be included. Some type of reference (e.g., a page number from the field notes) should be added for any quotes.

- Reasons, knowledge, and attitudes

This column should include the caregiver's reasons for the practices listed in column 1. If the current practices are not ideal practices, the reasons given for not adopting the ideal practices should also be listed, along with any related knowledge or attitudes. Direct quotes from the Caregiver Survey can be included to support/explain the affirmation or negation of the ideal practice. Any conditions under which caregivers might change their practices should also be noted. Exhibit V shows an example from Bolivia.

**Exhibit V. Sample matrix summarizing caregiver reasons for current practices and knowledge/attitudes about ideal practices**

Ideal practice 1: All infants are breastfed for the first time within the first hour after birth

Current practice	Reasons, knowledge, and attitudes
Took less than one hour to breastfeed the child for the first time after birth. "Then they brought him to me around a half-hour later, and I breastfed him."	"I breastfed him because breast milk is the first thing the baby should drink to be protected from illnesses that are dangerous for babies; it's the best thing to do."

Source: Data from research carried out in Bolivia, Helena Pachón, Rollins School of Public Health, Emory University, personal communication.

Form I-8.3 should be completed as follows:

- Ideal practice

The ideal practice should be specified based on the definitions provided in [Table 1 in the Introduction](#).

- Barriers (internal and external)

The first two columns should be used to record factors that are barriers to the promotion of [behavior changes](#). These will be selected from factors listed under column 2 ("Reasons, knowledge, and attitudes") of Form I-8.2 as those most likely to prevent caregivers from adopting certain ideal practices.

Barriers will then be categorized as either "external" or "internal." External barriers include factors over which the caregiver has little (if any) control (e.g., availability of and access to certain foods;

access to cooking equipment, utensils, and fuel; and institutional policies such as the separation of mother and infant after birth). Internal barriers refer to factors intrinsic to the caregiver (e.g., knowledge, attitude, skills, and psychological traits).

- Facilitators (internal and external)

Like barriers, the facilitating factors (those that may make behavior changes possible and/or easier) will be selected from information listed under “Reasons, knowledge, and attitudes” in Form I-8.2 as those most likely to help or facilitate behavioral changes. Facilitators will also be categorized as “internal” and “external.” An example from research carried out in Bangladesh is shown in Exhibit W.

### Exhibit W. Sample matrix summarizing facilitators of/barriers to ideal practices

Ideal practice 1: All infants are breastfed for the first time within the first hour after birth

Barriers		Facilitators	
Internal	External	Internal	External
Did not know that baby has to be given breast milk first	Mother and child must be bathed first	Knew that it is important to breastfeed as soon as possible	Doctor said to immediately put baby to breast
Put baby to breast but there was no milk	Mother not well / unconscious / doctor took time to examine the mother		Had caesarean but nurses brought baby to feed immediately
Tried to breastfeed 6 hours later	Delay in bringing baby to be fed / caesarean, twin births		
Milk came in late	Grandmother's decision about what to give when baby was ill / weak, unable to suck		
Placenta delivered late	No one helped		
	Midwife discouraged breastfeeding for first 3 days		

Source: Data from research carried out in Bangladesh (Haider et al., 2010).

### Semi-structured Interviews Guide (Form I-8.1)

*This is a conversation guide. Therefore, the questions should not be posed verbatim as they are in a survey. To conduct a more fluid and natural interview, the Field Worker should be familiar with the topics and questions so that when needed he/she can adapt them to the child's age group.*

Good morning (afternoon), my name is \_\_\_\_\_ and I come from \_\_\_\_\_. As you may remember, I am here to talk with you about young children's eating patterns.

#### **I. General information**

*(If possible, this section should be completed before the interview.)*

1. Child's code
2. Child's name
3. Child's age (in months)
4. Caregiver's name
5. Date of interview (dd/mm/yyyy)
6. Date notes completed (dd/mm/yyyy)
7. Field Worker's name and code

#### **II. Questions to ask caregivers of children 0–5.9 months old**

***Ideal practice 1. All infants are breastfed for the first time within the first hour after birth***

8. How long after birth was the baby breastfed for the first time?

- [IF IT TOOK MORE THAN 1 HOUR] *Why did it take that long?*
- [IF IT TOOK MORE THAN 1 HOUR] *Would it have been possible to breastfeed within the first hour after birth?*
- *What would have needed to happen to make it possible for the baby to be breastfed for the first time within the first hour after birth?*

***Ideal practice 2. All infants are not fed with anything other than breast milk in the first 3 days of life***

9. Was the baby given (by you or anyone else) anything to eat/drink before he/she was first breastfed?

- [YES] *What was given to the baby?*
- *Why was it given to her/him?* [ASK FOR EACH FOOD/DRINK THAT WAS GIVEN TO THE BABY]
- *How did they give her/him this?* [UTENSIL USED; ASK FOR EACH FOOD/DRINK THAT WAS GIVEN TO THE BABY]
- *Who advised you to give this to the baby?* [ASK FOR EACH FOOD/DRINK THAT WAS GIVEN TO THE BABY]

- *If a friend told you she was **not** going to give [NAME ANY PRELACTEAL THAT CAREGIVER OR SOMEONE ELSE HAS GIVEN TO THE BABY] to a baby before first breastfeeding, what advice would you give your friend?*

***Ideal practice 3. All infants are fed colostrum***

10. *When did you first get your first milk [COLOSTRUM]?*

- Did you give that first milk to the baby?
- [YES] Why?
- [NO] What did you do with that first milk?
- Why didn't you give it to the baby?
- If you cared for another child, would you give her/him colostrum?
- Is there something that would help you do this?

***Ideal practice 5. All infants less than 6 months old are exclusively breastfed***

11. *What do you think about feeding a baby with only breast milk (without water and other liquids) for the first 6 months of life?*

- If you were to care for another baby, would you be willing to only feed her/him breast milk for the first 6 months of life (that is, until she/he turns 6 months old)?
- What would make it easy for you to do this?
- What would make it hard for you to do this?
- What advice would you give to a friend who wanted to do this?

***Ideal practice 7. That all infants are fed semi-solid complementary foods beginning at 6 months of age.***

12. *Have you given any food to your baby?*

- How old was your baby when you gave him/her food?
- Why did you think your baby needed food?
- What was the first food you gave your baby to eat?
- Why did you decide to start with this particular food?
- At what age would you advise a friend to start feeding her baby food?
- What food or foods would you recommend?

***Ideal practice 12. All infants and young children 6.0–23.9 months old are fed as recommended during and after illness***

13. *How do you feed the child when he/she is sick?*

- *Would you encourage the child to breastfeed more when he/she is sick?*
- *If yes, how would you do this?*

**III. Questions to ask caregivers of children 6.0–23.9 months old**

***Ideal practice 4. All infants and young children are breastfed on demand, during the day and night***

14. Are you currently breastfeeding the baby?

- [YES] *How often do you breastfeed?*
- *Do you breastfeed 1) on a fixed schedule or 2) each time the baby asks to be fed?*
- [IF 1:] *Why? What conditions would be necessary for you to breastfeed only when the baby wants to feed and not on a fixed schedule?*
- [IF 2] *Has anyone recommended that you breastfeed on a fixed schedule? Who?*

***Ideal practice 6. All children are breastfed up to 2 years of age or more***

15. *Until what age do you plan to breastfeed the baby?*

- *Why that age?*
- *IF LESS THAN 2 YEARS OF AGE: If you decided to breastfeed until the baby is 2, would you be able to do it?*
- *Why? Why not?*

16. *At what age did you stop breastfeeding?*

- *Why did you stop at that age?*
- *Is there anything that would convince/permit/help you to be able to continue breastfeeding until the baby turns 2 years old?*

***Ideal practice 7. All infants are fed semi-solid complementary foods at 6.0 months of age (180 days)***

17. *Have you given any food to the baby?*

- *What was the first thing you gave the baby to eat?*
- *Why did you decide to start with this particular food?*
- *How old was the baby when you gave her/him this particular food for the first time?*
- [BEFORE 6 MONTHS] *Did you know that giving only breast milk, not even water, for 6 months would prevent the child from getting some diseases?*
- *If you decided to only give breast milk to a baby for the first 6 months of life what would make it easy for you to do it?*
- [AFTER 6 MONTHS] *Did anyone tell you that at 6 months of age the child needs to begin eating foods?*
- *If you had another baby, would you consider to begin giving food to the child at no later than 6 months of age? Why/why not?*

***Ideal practice 8. All infants and young children 6.0–23.9 months old meet their recommended daily energy requirements***

18. If you realized it was necessary to increase the amount of food that you give the child, would you be able to do this?

- What difficulties would you have? What would help you to do this?

***Ideal practice 9. All infants and young children 6.0–23.9 months old are fed nutrient- and energy-dense foods***

19. Do you prefer to feed the child foods that are more liquid or more solid (thicker)?

- [IF PREFERS “MORE LIQUID” FOODS] Do you think thicker, more solid, foods should be given to small children in some situations or at some age? When?
- What would you say to a friend who is giving, or thinking of giving, thicker, more solid foods to a 6-month-old baby?

***Ideal practice 10. All infants and young children 6.0–23.9 months old are fed the recommended number of meals daily***

20. How many times a day do you feed the child? [ASK ABOUT MAIN MEALS AND SNACKS]?

- [IF THE FREQUENCY IS LESS THAN THE RECOMMENDED FREQUENCY FOR THE AGE GROUP] If a health professional asked you to increase the number of times you feed the child each day, and you agreed with this, would you be able to do it? What difficulties would you have? What would help you to do this?
- [IF THE FREQUENCY IS MUCH MORE THAN THE RECOMMENDED FREQUENCY FOR THE AGE GROUP] If a health professional asked you to decrease the number of times you feed the child each day, what would be your reaction?

***Ideal practice 11. All infants and young children 6.0–23.9 months old fed by caregiver responsive to child***

21. If the child stops eating, and you think he/she is still hungry or did not eat enough, what do you do?

IF THE MOTHER ANSWERS: “I WOULD MOTIVATE HER/HIM TO EAT”:

- How would you motivate her/him to eat?
- What could you do so that the child has someone to help or motivate her/him eat at every meal?
- What difficulties would you have in doing this?

IF THE MOTHER DOESN'T SAY SHE WOULD MOTIVATE:

- Why wouldn't you motivate?

***Ideal practice 12. All infants and young children 6.0–23.9 months old are fed as recommended during and after illness***

22. How do you feed the child when he/she is sick?

- Do you breastfeed more, less or the same as when he/she is healthy?
- Do you give more food, less food or the same amount as when he/she is healthy?
- Do you give the child more, less or the same amount to drink as when he/she is healthy?

IF MORE:

- *How do you get the child to breastfeed more when he/she is sick?*
- *How do you get the child to eat more when he/she is sick?*
- *How do you get the child to drink more when he/she is sick?*

IF LESS:

*Why?*

*If you thought the child needed to breastfeed/eat/drink more, when he/she is sick, can you think of a way to make the child to breastfeed/eat/drink more?*

23. *How do you feed the child in the week after he/she has been sick?*

- *How do you get/would you get the child to eat more in the week after he/she has been sick?*

**Matrix for summarizing reasons for current practices, and knowledge/attitudes about ideal practices (Form I-8.2)**

Interviewee's name: \_\_\_\_\_

Date of interview: \_\_\_\_\_

Child's age (in months): \_\_\_\_\_

Ideal practice: \_\_\_\_\_

[illegible]

deal practice: \_\_\_\_\_

[illegible]

## Annex I-9: Food Attributes Exercise

### Objectives

- Identify positive and negative characteristics attributed to key foods by caregivers
- Determine which key foods are fed to children, and why
- Identify at which age key foods are first offered to children, how they were prepared, and how they are prepared for older children
- Explore the conditions and changes required for caregivers to offer nutrient-rich foods not currently offered to infants and young children

### Products

- Summary of key foods that are offered to children and those that are not, and the reasons why
- List of positive and negative characteristics attributed to each key food by caregivers
- Information about the age at which each food was offered for the first time, how it was prepared then, and how it is prepared now
- List of conditions and changes that would be required for each potential food to be offered to young children

### Steps

#### 1. Preparation and planning

The Key Foods List should be developed using the information obtained from the 24-hour Dietary Recall and Anthropometry and the Market Survey). This list would include 25–30 foods identified as those 1) most commonly given to children 6.0–23.9 months old or 2) most likely to be used in an intervention.

Once this is done, a photo should be taken or a drawing made of each key food. The photo or drawing should depict the food's characteristics as clearly/visibly as possible and should exclude accessories such as baskets or tablecloths that may distract the caregiver. The photos/drawings should be uniform in terms of paper type and size, and other characteristics related to their overall appearance. When working with low-literacy populations it may be preferable to use actual samples of the key foods with attached labels (cards, etc.) identifying them.

Before being used in the exercise, all photos/drawings of foods must be validated in the study communities. The Supervisors should show the cards to approximately 10 caregivers and ask them to identify each food. If the foods are identified correctly by the majority of the caregivers, the cards may be used in the exercise.

A code corresponding to each food should be written on the back of each card, and the name of each food should be written clearly on the front of each card.

## **2. Selection of participants**

To apply the Food Attributes Exercise, it will be necessary to obtain a minimum sample of 10 caregivers of children 6.0–23.9 months old. The sample does not have to be randomly selected and can be composed of caregivers who have already participated in the application of other **ProPAN** research instruments. Sampling should be purposive, and the research team should define the criteria for selecting the caregivers (e.g., “caregivers of children in the target age group” or those who are “community leaders,” “volunteers,” “vendors,” or other roles common for caregivers of young children in the community).

## **3. Materials**

- Set of cards/pictures with each key food
- Food Attributes Exercise Guide (Form I-9.1)
- Copies of the List of key food consumption and attributes (Form I-9.2)
- Pencils/pens
- Clipboard
- Identification card

## **4. Required personnel and time**

The Food Attributes Exercise should be applied by the Field Workers. Each Field Worker should be able to apply the exercise to two to three caregivers per day.

## **5. Description and procedures**

When interviewing caregivers, Field Workers should explain that there are no wrong answers and that the information provided will contribute to the understanding of feeding practices of young children and help their caregivers provide better care.

On Form I-9.2, record the codes and names of each of the key foods. Show the first card to the caregiver and ask the following question:

- *Do you feed [name of key food] to the child?*

Based on the response, write “Yes” or “No” on Form I-9.2. Then ask these follow-up questions:

- [If the answer is “Yes”:] *Why or for what reason do you feed this to the child?*
- *How old was the child when you started feeding this food to her/him?*
- [If the answer is “No”:] *Why don’t you feed this to the child?*  
[Or:] *What happens if you feed this to the child? At what age can you feed this to the child?*

If the caregiver says she gives the food to the child, ask her the following questions:

- *How do you prepare this food when you feed it to the child?*

- *How do you feed it to the child? Why?*
- *How often do you feed it to the child? Why?*

If the caregiver says she does not feed the food to the child, try to obtain more information to determine the possibilities for behavior change. For example, the following questions could be asked:

- *You tell me that you don't feed the child beans because the skin will stick to her/his stomach. Can you think of a way to prepare beans so that the child can eat them without this problem (the skin of the beans sticking to her/his stomach)?*

If the caregiver does not answer or says she cannot think of a way to avoid the problem described above, ask her the following question:

- *If we could find a way to prepare beans so that they do not have the skin on them, would you feed them to the child?*

Each answer should be recorded next to the specific food referred to in the question. Everything the caregiver says should be recorded, using her own words. Additional, exploratory questions like the ones listed below may also be posed:

- *What else do you know about this food? What do other caregivers in the community say about this food?*

Proceed in the same manner with all of the foods described in the cards. Some caregivers may be reluctant to answer or may only give a little information about the foods. If this occurs, insist politely that they try to answer the question and provide as much information as possible.

## **6. Analysis**

The analysis should be done by hand using the Matrix for summarizing key food consumption, attributes, and preparation (Form I-9.3) (see the sample matrix from Mexico in Exhibit X). All foods should be listed in column 1, and all information from caregivers should be listed in the corresponding columns (positive and negative attributes; if it is fed to the child; how it is prepared; how it was prepared the first time it was given to the child; how it could be prepared for a child under 6 months old; and under what conditions the caregiver would feed it to a child under 2 years old). When completed, Form I-9.3 will contain a summary of the responses given by all caregivers for each food.

**Exhibit X. Sample matrix summarizing key food consumption, attributes, and preparation**

Name of key food	Attributes		Do you feed it to the child now?	How do you prepare it for a child [specify child's age group]?	How did you prepare it the first time you fed it to a child [specify child's age group]?	How would you prepare it for a 6-month-old infant?	Conditions necessary to feed it to a child under 2 years old
	Positive	Negative					
Mango	It is tasty; children love it	It is cold; it gives diarrhea	Yes; it is good for children after 12 months of age	Just like it is: plain (13 months)	Shredded (6 months)	Chopped and mashed	Available in the home
	It is nutritious; it's a good food	The skin is bad for their stomach	No; should not be eaten until child has more teeth; it should be fed after 9 months of age because of the "threads" (fibers); I start feeding it when he is 1 year old	They eat it like dessert (8 months)		Blended with milk	
			<i>If you strained it and took the threads out, would you feed it to your child?</i>				
			No; it would still give her diarrhea				

Source: Data from research carried out in Mexico.

### Food Attributes Exercise Guide (Form I-9.1)

Good morning. My name is \_\_\_\_\_ and I come from \_\_\_\_\_. We are speaking with families who have children under 2 years of age. Do you have a little time to talk with me about the foods that you feed the child?

We are going to talk a little about the foods that are shown in these pictures. There is no right or wrong answer to the questions I will be asking. The information you will provide will help us in our efforts to improve the feeding of young children.

[Show the first picture/drawing]:

*Do you know what this food is?*

NO: [Tell the respondent the name of the food.] Do you recognize the food? [If she does not, go to the next food item.]

YES: *Do you feed [name of key food] to the child?*

YES: *Why/for what reason do you feed this to the child? How old was the child when you first gave her/him this food? Is there a reason why you started giving it at this age [ $\geq 6$  months]? Could you give [name of key food] to a 6-month-old infant who is just beginning to eat? Why?*

NO: *If it were prepared in some special way, would you feed it to a 6-month-old infant?*

NO: [go to item below]

YES: *Could you explain how it should be prepared to be fed to a 6-month-old infant?*

YES: *How do you prepare this food when you feed the child? [Or:] How do you feed this to the child? Why?*

NO: *Why don't you feed this to the child? What happens if you do? At what age can a child start eating this? Why at this age?*

*You tell me you don't feed [name of key food] because [reasons given by caregiver]. Can you think of a way to prepare this food so that you could give it to the child without [consequences/reasons expressed by caregiver]? Please explain how.*

NO: *If the food would be prepared [any idea that occurs to you—e.g., "thicker," "with meats," "with vegetables," etc.] would you feed it to the child? Why?*

*What else have you heard about [name of key food]?*

*What do other caregivers or people in the community say about feeding this food to young children like your son/daughter?*

Interview date \_\_\_\_/\_\_\_\_/\_\_\_\_ Page \_\_\_\_ of \_\_\_\_

Child's name \_\_\_\_\_

Child's age: \_\_\_\_\_

Informant's name: \_\_\_\_\_ Informant's code: \_\_\_\_\_  
Field Worker's code: \_\_\_\_\_

[illegible]

### Matrix for summarizing key food consumption, attributes, and preparation (Form I-9.3)

[illegible]

## Master matrix for integrating and analyzing data (Form I-10.1)

[illegible]

## Matrix for listing key foods (optional) (Form I-10.2)

[illegible]

[illegible]

Matrix for analyzing impact, feasibility, and observability of recommended practices (Form I-10.4)

Criteria	Impact, feasibility, and observability (sum of scores for criteria #1-7)												
	7. Observability												
	Feasibility (sum of scores for criteria 2-6)												
	6. Complexity												
	5. Cost in time and/or effort												
	4. Cost in material and monetary resources												
	3. Compatibility with beliefs and knowledge												
	2. positive Consequences												
	1. Impact												
Recommended practices													

[illegible]

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# Testing Recommendations and Recipes

## Purpose

In this module, the research team will learn how to evaluate the acceptability and feasibility of the potential recommendations, developed in Module I, to improve infant and young child diet and feeding practices, and the likelihood they will be adopted. If Module I has not been applied, potential recommendations can be developed from research conducted by academic institutions, the Ministry of Health or existing programs.

These recommendations may include:

- changes in behavior by caregivers and other individuals such as health workers
- adoption of modified traditional recipes (to improve their nutritional quality)
- adoption of new recipes containing commonly used ingredients

The main component of this Module is the Test of Recommendations which shall be used to select the final recommendations to be promoted in the intervention.

Guidelines are also provided for two optional activities. The Recipe Creation Exercise can be used to develop new or modified recipes if existing recipes are deemed nutritionally inadequate. Focus Groups can be used to confirm or clarify findings generated in this Module and Module I.

These methodologies are carried out with various members of the population targeted by the recommendation (usually caregivers, family members, or health workers) and can also be used to suggest changes in recommendations in order to make them more easily acceptable.

## Products

Completing this module will generate the following products:

- Information to enable prioritization of the recommendations identified in the nutrition assessment (Module I), including information about 1) the feasibility of the recommendations, and 2) any facilitators of or barriers to their adoption
- Information about the recommendations that can be used to make their adoption more feasible
- New and/or modified recipe(s) made with locally available and accessible ingredients that are likely to be acceptable by the target population (if the optional *Recipe Creation Exercise* is carried out)
- Data to be used for developing the strategies, activities, materials, and messages that will be part of the intervention to promote the final recommendations

## Steps

This module consists of seven main steps:

1. *Reviewing and analyzing data* to select the recommendations to be tested and to decide if the *Recipe Creation Exercise* will be applied.
2. *Preparing for field work*. This step includes all activities that need to be completed prior to conducting the recipe creation exercise and/or the *Test or Recommendations* and include for example selecting a place, acquiring the materials and obtaining approval from local leaders.
3. *Conducting Recipe Creation Exercise (optional)* if the team decides that new or modified recipes will be part of the intervention.
4. *Applying the Test of Recommendations* to verify the feasibility of the adoption of recommended practices.
5. *Conducting preliminary analysis* to select the recommendations that will be part of the intervention and to decide if it is necessary to conduct focus groups before making the final decision on the recommendations.
6. *Conducting Focus Groups (optional)* to clarify inconsistencies and doubts before deciding on the final recommendations.
7. *Selecting the final list of recommendations to be promoted in the intervention*

### Step 1. Review and analyze data

#### Objectives:

- Select a list of recommendations to be tested, which may include new or modified recipes
- Decide whether the *Recipe Creation Exercise* will be applied or not

Module I (or research available from another source) will have provided some potential recommendations which may include or not the need for new or modified recipes.

Based on the analysis of data collected in Module I (or from another source), the team will decide whether to apply the Recipe Creation Exercise. Criteria for this decision are described in Overview of Research Methodologies.

### Step 2. Prepare for field work

If Module I was not applied, the team will need to consult the sections on *Establishing local contacts* and *Adapting and translating the forms* when preparing for field work.

The selection of participants, and the hiring and training of personnel will be specific for each methodology, and is explained in *Overview of Research Methodologies*.

**Obtaining ethical approval**

Applying any of the three research methodologies requires ethical approval from an institutional review board (IRB) and Informed consent from the study participants. IRB ethical approval and informed consent are discussed briefly in Step 2 of Module I, and a sample Consent letter and form (Form I-2.1) are provided in Annex I-2. If research methodologies from both Module I and Module II are going to be applied, a single application to the IRB that includes the total scope of the research is sufficient.

**Preparing a work schedule**

The time and resources needed to ensure the feasibility of the recommendations and their acceptability by the target population prior to promotion at scale depend on the size of the intervention. If all three methodologies described above are used, they should be implemented consecutively, beginning with the *Recipe Creation Exercise* and ending with *Focus Groups*.

Completion of the *Recipe Creation Exercise*—including the training of the Field Workers, the implementation, and the data analysis—is estimated to take one to two weeks. Carrying out the *Test of Recommendations* will take another two to three weeks. The time required to conduct *Focus Groups* will depend on the number of topics covered and the number of *Focus Groups* conducted per topic. Planning for and implementation of a single Focus Group and topic should take about two days, and the analysis of its results two to three more days. However, if multiple *Focus Groups* are to be conducted for the same topic, the planning time will be reduced and the analysis of the results should go more quickly.

**Step 3. Conduct the Recipe Creation Exercise (Annex II-1)**

The purpose of conducting the *Recipe Creation Exercise* is to develop and/or modify recipes that will be part of the intervention.

See the Overview of research methodologies in this module for more information about the methodology, and Annex II-1 for guidelines on how to apply it.

**Step 4. Apply the Test of Recommendations (Annex II-2)**

The *Test of Recommendations* is used to observe the way in which participants carry out the proposed recommendations under typical conditions, and thus helps clarify the feasibility of behavior change. If the recommendations are not pre-tested, there is a risk of poor compliance with the recommendations. Therefore, the *Test of Recommendations* is not optional

The *Test of Recommendations* should be applied to all recommendations that have been determined to have the potential to positively affect the nutritional status of infants and young children and will require a change in behavior by an individual (other than the exceptions listed below) Examples of potential recommendations are shown in Table 1.

**Table 1. Sample potential recommendations for various target groups**

Type of recommendation	Target group	Potential recommendation
New practice	Nurse	Tell caregivers of young children who visit the health unit to “teach the child to eat with love, patience, and good humor” to all caregivers of young children
Modified practice	Caregiver	Add a special ingredient (e.g., meat, fish, or egg) to the child’s main meal each day (i.e., modifying the practice of giving a main meal by adding a special ingredient)
Recipe from <i>Recipe Creation Exercise</i>	Caregiver	Feed the child mashed potatoes and squash with chicken liver at least once per week
New product	Health worker	Tell caregivers of young children to “add multi-micronutrient powder daily to one of the child’s meals”
Observation-based practice <sup>a</sup>	Physician or midwife	Wait to cut the umbilical cord until it has stopped pulsing (i.e., the recommended practice of cutting the umbilical cord requires observation that the cord has stopped pulsing)

<sup>a</sup> Testing this type of recommendation requires more time and human resources than those for which information about adoption is based only on recall.

All recommendations that are considered important candidates for promoting in an intervention should be tested, except the following:

- Recommendations that cannot be tested in a short period of time (e.g., “infants exclusively breastfed for first 6 months of life”)
- Recommendations that depend on events that cannot be planned with precision (e.g., “breastfeed immediately after giving birth”)
- Recommendations already practiced by most caregivers (e.g., “breastfeed on demand”).

In contrast to the *Recipe Creation Exercise*, which is applied in a pre-arranged situation, with all foods and materials provided by the research team, the *Test of Recommendations* must be applied to study participants under “typical” conditions, as the purpose is to determine the likelihood that the recommendation will be carried out under participants’ current conditions. Therefore, items needed to carry out the *Test of Recommendations*, such as recipe ingredients and cooking fuel are not provided by the research team. For example, when testing the recipe recommendation shown in Table 1 (“Feed the child mashed potatoes and squash with chicken liver at least once per week”), household resources would be used (i.e., the ingredients would not be brought to the home visit by the research team).

Exceptions to this rule would include recommendation that entailed the use of 1) new materials or products, such as micronutrient powders, or 2) visual aids, such as decision trees, flip-charts, counseling cards, etc. For these types of recommendations, all materials and products used during testing would be provided by the research team.

See the Overview of research methodologies in this module for more information about the methodology, and [Annex II-2](#) for guidelines on how to apply it.

**Step 5. Conduct preliminary analysis of the recommendations**

A rapid analysis of the *Recipe Creation Exercise* and the *Test of Recommendations* should be performed to verify if there are issues that need to be clarified by conducting *Focus Groups*, which is optional.

**Step 6. Conduct Focus Groups (Annex II-3)**

If after conducting the Test of Recommendations the team finds out that there are inconsistencies between its results and the data analysis conducted earlier, or there are doubts that need to be clarified before allocating resources to the intervention, *Focus Groups* will be used for that purpose.

See the Overview of research methodologies in this module for more information about the methodology, and [Annex II-3](#) for guidelines on how to apply it.

**Step 7. Select the final list of recommendations to be promoted in the intervention.**

Module I includes a step-by-step guide for identifying the recommendations with the greatest potential impact on nutrition and dietary problems. These recommendations are further streamlined in this Module by testing their acceptability, feasibility and likelihood of adoption by the target population.

The research team should then complete the summary of the [Final Recommendations \(Form II-4.1\)](#) which should include three to five recommendations.

Once the final recommendations have been identified, the research team can begin the process of designing the strategies for an intervention to promote them (described in [Module III](#)).

## Overview of research methodologies

**Recipe Creation Exercise (Annex II-1)**

The *Recipe Creation Exercise* is optional and should be carried out if the research team determines that none or only a few of the [ingredients](#) and [dishes](#) identified in [Module I](#) have a high nutritional value, and therefore the introduction of something new is found to be necessary, be it an age appropriate dish or the addition of ingredients to existing dishes to increase their nutritional value.

To decide whether to apply the *Recipe Creation Exercise*, the research team should ask these questions:

1. Do data from Module I suggest that intake of energy or nutrients was lower than recommended?
2. Do data from Module I suggest that there were adequate recipes that with some modification could be excellent sources of energy or nutrients found deficient?
3. Do data from Module I suggest that there were no recipes that stood out as being excellent sources of energy or nutrients found deficient in the target population?

If 1 and 2 are true, the research team should use *Recipe Creation Exercise* to modify recipes. If 1 and 3 are true, the research team should use *Recipe Creation Exercise* to create new recipes.

If used, the *Recipe Creation Exercise* must be conducted before the *Test of Recommendations* to develop new recipes or modify commonly used recipes, with the active participation of primary caregivers, using available, accessible, and acceptable ingredients. Some of the recipes described by caregivers in the 24-hour Dietary Recall and Anthropometry may be chosen for this activity. It is not necessary to apply this methodology if recipe creation or modification is not being considered as part of the intervention plan.

### **Objectives**

The main goal of the *Recipe Creation Exercise* is to obtain nutritious dishes that may address dietary inadequacies identified in the target population during Module I. This methodology is not designed for testing or identifying recipes that caregivers already prepare at home but rather for creating new recipes or modifying existing ones.

The specific objectives are to:

- Develop new recipes appropriate for infants and young children through the active participation of caregivers
- Improve existing recipes for infants and young children through the active participation of caregivers (e.g., increasing the iron or vitamin A content by adding other ingredients, or modifying their quantities or proportions)
- Identify different recipes that can be prepared with the same foods.

### **Products**

- New recipes (for selection of those most appropriate for infants and young children and with the highest nutritional value)
- Improved recipes (with a greater variety of ingredients and higher nutritional value than the traditional/commonly used recipes from which they were created)

## **Test of Recommendations (Annex II-2)**

### **Objectives**

- Determine the acceptability of the recommendations
- Identify which aspects of the recommendations are adopted and which ones are not
- Identify barriers to the adoption of the recommendations (e.g., lack of skills or resources, perceptions, beliefs)
- Identify facilitating factors (e.g., family support, perceived benefits, accessibility of resources, etc.)
- Document any changes or improvements the participants make to the original recommendations
- Obtain information on how to modify the recommendations in order to make their adoption more likely

- Identify strategies that can be used to reinforce the adoption of the recommendations
- Collect information to help identify strategies for the intervention

### **Product**

- List of recommendations that are most likely to be adopted

The advantage of the *Test of Recommendations* is that the target population can test and evaluate the recommended behaviors (including those involving new recipes), and provide feedback, in their own environment. This helps determine the following:

- The ease or difficulty of communicating with the target population about potential recommended practices
- The need for any modifications that make the recommendations more acceptable to the target population
- Any barriers to changes in behavior
- The proportion of participants able and willing to adopt each recommended practice or recipe.

The main limitation of this methodology is the short time period in which the recommendations are tested (usually between one and two weeks), given the fact that, in practice, participants will have to follow the recommendations for a few months or even longer. For this reason, positive results from the application of this methodology should not be interpreted as a guarantee that the target population will adopt the recommendations in a sustainable manner but rather that the recommendations are likely to be adopted. The results may also indicate ways in which the recommendations can be most effectively promoted.

### **Focus Groups (Annex II-3)**

The use of *Focus Groups* is optional. This methodology should be carried out when, as a result of the *Test of Recommendations*, changes to one or more recommendation are substantial and therefore more information than that provided by the *Recipe Creation Exercise* and *Test of Recommendations* is needed to confirm these changes with groups from the target population. *Focus Groups* can provide useful information about the potential recommendations without the need for structured interviews or other time-consuming data collection methods. The main purpose of *Focus Groups* is to have not only caregivers but also family members, health workers, traditional birth attendants, and other gatekeepers provide their opinion about the revised recommendations to ensure their acceptability and feasibility.

The decision to use *Focus Groups* depends on how confident the research team feels about the likelihood of adoption of the recommendations that will be promoted in the intervention, and the type of problems encountered in the *Test of Recommendations*. For example, if 10 potential recommendations emerged from research conducted in Module I, and results of the *Test of Recommendations* indicated barriers to the top five that were only related to wording (i.e., the clarity of the instructions for carrying out the behavior, rather than the behavior itself), further evaluation using a *Focus Group* would not be necessary.

On the other hand, if the results indicated acceptability of a recommended behavior was low because of beliefs about the behavior itself (e.g., adding egg to the daily diet of children  $\geq 6$  months old was only partially adopted because mothers or mothers-in-law did not think young children should eat eggs), conducting a *Focus Group* among caregivers' families could help determine the reasons behind the belief and how the low acceptability could be addressed.

*Focus Groups* can be conducted in the same communities where the *Test of Recommendations* and *Recipe Creation Exercise* were carried out. The questions should be concise and focus mainly on any areas of doubt.

### **Objectives**

- Resolve any doubts and clarify inconsistencies about information collected during the assessment of nutrition status (in Module I) or the *Test of Recommendations*
- Confirm the likelihood that the target population will adopt any recommendations that were modified after applying the *Test of Recommendations* and/or the *Recipe Creation Exercise*

### **Product**

- Better understanding of the potential acceptability of the recommendations modified in the *Test of Recommendations* and/or the *Recipe Creation Exercise*

## Annex II-1: Recipe Creation Exercise (optional)

### Objectives

With the active participation of the caregivers:

- Develop new recipes appropriate for infants and young children.
- Improve existing recipes for infants and young children
- Identify different recipes (both new and modified) that can be prepared with the same ingredients

### Products

The *Recipe Creation Exercise* will generate the following products:

- A selection of new age-appropriate recipes with higher nutritional value than those currently being used Improved recipes that include a greater variety of recipes and that have a higher nutrition density than those currently being consumed
- Different recipes that can be prepared with the same ingredients.

To determine the degree of acceptance by children 6.0–23.9 months old and the adoption by their caregivers, the recipes for the dishes selected should be included in the Test of Recommendations (Annex 2).

### Steps and logistics

#### 1. Preparation and planning

##### Selection of potential ingredients

Based on the results of Module I, potential ingredients and dishes will be selected for the Recipe Creation Exercise (Creed-Kanashiro et al., 1991). The ingredients should be selected from the Key Foods List and those reported in the 24-hour Dietary Recall and Anthropometry, the Food Attributes Exercise, and the Market Survey.

Criteria for selecting the ingredients include the following:

- Availability (available in the home or sold in the community)
- Nutritional value (high in nutrients found to be lacking in the diet)

- Cost per nutritional benefit (good nutritional value in relation to cost)
- Actual use (use by families and method of cooking and preparation)
- Acceptability (cultural acceptability as foods for young children)

### **Identification of potential ingredients and dishes**

Once potential ingredients and recipes to be used in the intervention have been selected, the most nutritionally appropriate ones should be identified by the research team keeping in mind the dietary inadequacies found during the assessment carried out in Module I. These potential ingredients and dishes should be presented to caregivers who would then be asked to create new recipes or modify existing ones. For example, in Peru caregivers were given potatoes, squash, chicken liver, and oil as one set of ingredients and toasted wheat-flour, toasted pea-flour, carrots, oil, and sugar as another set (Creed-Kanashiro et al., 1991). In Guatemala, caregivers were given cooked black beans, corn meal, and a dark green leafy vegetable (Rivera et al., 1998).

Two sessions should be carried out for each set of ingredients in order to obtain multiple recipes. If time is an issue, two or three different sets of ingredients may be tried in the same session.

### **Training and standardization**

Supervisors, Field Workers, and other individuals who will carry out this research methodology must be trained and their specific tasks standardized.

## **2. Selection of participants**

Participants in the *Recipe Creation Exercise* should be the potential users of the recipes (i.e., caregivers of infants and young children).

For each session, 8–10 caregivers with similar characteristics (e.g., from the same community or with similar economic conditions) should be identified. If it is likely that not all the caregivers invited will be able to participate, it is recommended to invite approximately twice the total number required for each session (e.g., 20 caregivers invited for a session with 10 caregivers). In addition, as these sessions require the active participation of each participant, the research team should try to form a group that is likely to work well together and avoid including participants that might intimidate others because of social status in the community or personality traits.

To further increase participation, the sessions should be held at a convenient time for caregivers. In Mexico, it was observed that the main reason why many caregivers did not participate was that the sessions were held in the mornings and many caregivers needed to be at home to prepare the main midday meal.<sup>18</sup> Another way to motivate caregivers to participate is to invite them to bring containers to take home the dishes they will prepare during the sessions. This way, they will not have to prepare a meal when they return to their homes and will perceive added benefit from the sessions. Caregivers might also be asked to bring their own cooking utensils to the sessions to make them more comfortable with the exercise and to give them an added sense of their contribution. However, in certain cultures this suggestion might seem offensive and counterproductive.

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<sup>18</sup> María Guadalupe Rodríguez Oliveros, Instituto Nacional de Salud Pública, Mexico, personal communication.

Caregivers should be invited to a place with cooking facilities, such as a cafeteria, a health center, or the home of one of the participants. The research team may want to pick up the women and children at their homes and escort them to the locale. If distances are great, the team may consider hiring local transport or providing bus fare to bring women and children to the meeting place. Caregivers should take their children to the sessions so the children can taste the final dishes and Field Workers can collect information on the caregivers' opinions about their children's acceptability. To ensure that caregivers are able to participate fully in the session, it is recommended to have two or three people watching the children during the session, and to have toys on hand for them.

### **3. Materials**

- Copies of the *Recipe Creation Exercise Form (II-1.1)*
- Pencils/pens
- Food scale with a capacity to 5 kg and a minimum precision of 2 g
- All ingredients expected to be used by caregivers
- Common household measures for caregivers to use (such as those used in the *24-hour Dietary Recall and Anthropometry*)
- Potable water for cooking
- Water and soap for hand and food washing
- A shallow tub over which hands can be washed, if there is no running water available
- Towels to dry off hands
- Towels to dry off cutlery, dishware and pots
- Kitchen rags to clean counter tops
- Cooking utensils (such as spoons, cups, pots, pans, knives and cutting boards)
- Several tables or mats to work on
- Aprons
- Grinder, blender or other kitchen tool used to grind, mash or chop ingredients
- Range, stove top, fire or any other equipment to use for cooking or heating and fuel
- Eating and drinking utensils (e.g., plates, spoons, cups and napkins)

### **4. Personnel, site, and time**

Since a single *Recipe Creation Exercise* may last two hours or more, it is not realistic to expect that more than one session can be carried out per day. If dishes with extended cooking times are included and are not pre-cooked, the session will last longer. If several recipes will be tested, the time required for the whole exercise, including the analysis of results, is one to two weeks.

The sessions should be carried out in a relatively controlled atmosphere, where caregivers are provided with the ingredients, cooking utensils, and fuel, among other resources, for the recipe creation or modification. The place where the sessions are held should be a comfortable area in which all the participants feel at ease cooking and tasting the new dishes, feeding them to their children, and discussing their impressions. This will increase the probability that they will participate actively and creatively.

The leader of the sessions should be the Nutritionist supervising the fieldwork, who should have the skills to guide the participants through all of the steps of a Recipe Creation Exercise. In addition to the Nutritionist, two or three Session Facilitators should also be present at each session. Both the Nutritionist and the Session Facilitators should have excellent interpersonal communication and observation skills.

If the Field Workers participating in the *Recipe Creation Exercise* took part in activities for Module I, the training sessions should take only two to three days, as they should already be familiar with the study communities and the project background and objectives.

### **Nutritionist**

The Nutritionist should be responsible for the following tasks:

- Selecting the ingredients that will be used and identifying the recipes that will be presented
- Arranging for a place to cook, and the necessary cooking utensils, equipment, fuel and foods
- Motivating the participation of caregivers in the sessions by creating and maintaining a dynamic atmosphere
- Moderating the session: introduce the session, ask the caregivers about the ingredients provided, give instructions, observe the preparation of the recipes, and guide the final discussion
- Gathering and completing notes taken on Form II-1.1 during the exercise
- Coordinating the analysis of the recipes

### **Session Facilitators**

The Session Facilitators should be responsible for the following tasks:

- Helping to identify and prepare the place for the session
- Identifying the participants
- Visiting and inviting the selected caregivers
- Taking notes during the preparation and discussion
- Assisting in the analysis of the recipes

## **5. Description and procedures**

### **Pre-session**

The research team should clean and organize the place where the session will be held, making sure that the necessary ingredients, and cooking utensils and equipment, are available and ready for use. Scales

and report forms for recording the recipes and results of the session should also be available. In Mexico, the research team also made *comales*<sup>19</sup> available because in one of the session the electricity went out making the electric grills unusable.<sup>20</sup>

### **During the session**

At the beginning of each session, the objectives of the exercise should be clearly stated. Caregivers should be asked to participate in the process of “making dishes that are even more nutritious, to feed small children like yours.” It is possible that some caregivers will attend the sessions thinking that they will be taught how to prepare special dishes or porridges. Therefore, in addition to telling them in advance the objectives of the session and what their expected role in it is, it will be necessary to remind them that they, not the members of the research team, will be preparing the dishes.

If the Nutritionist notices that some caregivers are not feeling comfortable with the idea of preparing dishes with other caregivers, he/she might use an “ice-breaker”<sup>21</sup> activity, or encourage them with positive words.

To help the caregivers prepare useful dishes, simple guidelines or criteria should be established depending on the objectives to be achieved. For example, if the objective is to create thick consistency dishes that are acceptable to children, this should be clearly explained to the caregivers first. If the objective is to use iron-rich ingredients, examples of these should be shown to caregivers.

Caregivers should be given clear directions, specifically tailored to the session, written in style similar to the sample listed below (Creed-Kanashiro et al., 1991, Dicken et al., 1997):

- The recipes should be appropriate for infants who are just learning how to eat
- The recipes should use few ingredients, preferably three to five, and be easy to prepare
- Specific combinations of ingredients should be used (e.g., two cereals servings for every bean or legume serving)
- The final dish should have a specific consistency (e.g., thick like mashed potatoes)
- The final recipes should always contain a particular ingredient that addresses one or more of the nutrients identified as deficient (e.g., a piece of meat, fish, egg, or vegetable)
- The recipe should be easy to prepare at home (e.g., it should not take too long to prepare, the ingredients and cooking utensils needed should be readily available, and it should be prepared based on dishes cooked for the entire family)
- The recipes should include ingredients to improve the taste and/or make it more attractive to children (e.g., they could include spices or aromatic herbs)
- The caregivers should name each recipe

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19 Charcoal ovens used in Mexico.

20 María Guadalupe Rodríguez Oliveros, Instituto Nacional de Salud Pública, Mexico, personal communication.

21 Icebreaker is an activity or game designed to break the tension. It is often used in focus groups to make people feel more at ease.

In previous projects, giving examples of recipes obtained during the assessment in Module I helped the caregivers understand these objectives.

Once the session objectives are clarified, the different ingredients with which the caregivers will be working should be shown to them. Then, they should be asked: 1) if they have access to them, and 2) which dishes they would create with those ingredients. In trying to determine “access” to ingredients, both availability in the community and the resources of caregivers to acquire them should be considered.

As an alternative to providing raw ingredients, the Session Facilitators could provide some pre-cooked ingredients (e.g., beans, cassava) to caregivers. This will reduce the preparation time significantly. If pre-cooked ingredients are used, it is important to ensure that they are prepared and stored hygienically, and reheated in a safe manner.

Caregivers should be asked to create “any dish” with the ingredients provided. Depending on the available resources and time, groups of three caregivers could be formed to simultaneously prepare different dishes. It is recommended that the caregivers be divided into groups according to the ages of their children. For example, groups of caregivers of children aged 6.0–8.9, 9.0–11.9, and 12.0–23.9 months could be formed.

If a caregiver would like to prepare or share more than one recipe and there is not enough time left in the session, she might describe it in detail to the Session Facilitator who can recreate the recipe at another time.

While the caregivers are cooking, the Nutritionist and Session Facilitators should observe and record the following information on Form II-1.1 (Recipe Creation Exercise Form):

- The ingredients amounts (in household measurements and in grams) used
- The steps followed to make the composite dish
- The preparation and cooking methods used
- The time it took to prepare and cook the dish
- The final amount (weight in grams)
- Participants’ comments regarding ingredients, cooking methods, and acceptability by the children

*Note:* In Mexico, it was useful to tape and take extensive notes on the caregivers’ comments, explanations, and reactions during the session.

### **Discussion about dishes**

Once the preparation of dishes is finished, the characteristics of the dishes should be discussed with the caregivers. All the caregivers and children should be invited to taste the dishes and give their opinions.

During the discussion, the following should be recorded on Form II-1.1:

- Children’s reactions (e.g., if they eat the dish, if they like it, how much they eat, etc.)
- Whether it is possible for the caregivers to prepare the recipes at home and under everyday circumstances

- Reasons why caregivers chose particular ingredients and decided against other ingredients
- Caregivers opinion about the taste, smell, appearance and consistency of each dish
- Caregivers' suggestions to improve or modify the recipes prepared

Ideally, caregivers should be gathered together after the cooking and tasting is completed to discuss their reactions, but this is often difficult to achieve. As an alternative, the Session Facilitators can listen to the caregivers' comments while they are preparing and cooking the dishes, tasting them, and feeding their children. In Bolivia, caregivers took approximately 15 minutes to feed the dishes to their children and the Session Facilitators used this time to ask each caregiver questions about the recipes, her opinions about them, and how she thought her child responded to their taste and consistency.<sup>22</sup> It is also important to observe the children when caregivers are feeding them. The Session Facilitators should then take notes on the children's behaviors (e.g., if a child refused to eat, or if a child ate but only while being motivated by the caregiver, and the amount each child ate).

Caregivers should be motivated to participate in this exercise because of the benefits for them, their children, and other children in the community. If a more tangible incentive can be provided to encourage caregivers to attend the sessions, consider providing child-oriented gifts such as baby spoons and bowls.

## 6. Analysis

Three analyses should be carried out for each of the dishes prepared: nutritional analysis, cost analysis, and dish acceptability and feasibility analysis.

### Nutritional analysis

The information collected for the nutritional analysis of the dish should be organized in the Matrix for analyzing recipe nutritional value and cost (Form II-1.2, options 1 and 2). Two sample matrices are shown below, one without nutritional calculations (Exhibit A, option 1), and one with nutritional calculations (Exhibit B, option 2).

#### Exhibit A. Sample matrix (option 1) for analyzing recipe nutritional value and cost

Recipe	Ingredients	Consistency (0. liquid, 1. semi-liquid, 2. thick, 3. solid)	Animal-source ingredients (number = 0, 1, 2)	Vegetables (number = 0, 1, 2)	Additional energy source (0. no, 1. yes)	Cost per 100 g (in Peruvian soles)
Mashed potatoes with squash and liver	Potatoes Squash Liver	2	1	1	0	1.25

Source: Hilary Creed-Kanashiro, Instituto de Investigación Nutricional, Peru, personal communication.

<sup>22</sup> Helena Pachón, Rollins School of Public Health, Emory University, personal communication.

In Exhibit A, for each recipe, the values in columns C–F can be summed (consistency, animal-source foods, vegetables, and additional energy source). A high score suggests a nutritionally dense recipe.

Alternatively, the recipes can be ranked according to nutritional objectives, based on the calculations for energy and nutrient density (Exhibit B). For example, based on the data shown in Exhibit B (from **ProPAN** research carried out in Mexico), the selected recipes were those with an energy density of 1 kcal/g or more and those meeting WHO recommendations for iron and zinc density of complementary foods for children 6–8 months old with average breast milk intake (see Table 2 in the Introduction).

### Exhibit B. Sample matrix (option 2) for analyzing recipe nutritional value and cost

Recipe	Ingredients	Energy density (kcal/g)	Iron density (mg/100 kcal) <sup>a</sup>	Zinc density (mg/100 kcal) <sup>a</sup>	Cost per 100 g (in Mexican pesos)
Vegetable and liver purée	Tomato Potato, Squash Carrot, Chayote Chicken liver	1	3.69	0.90	11.20
Onion smothered liver with orange	Potato Onion Orange juice Beef liver	1.29	2.88	1.41	16.90
Meat balls	Tomato Carrot Egg Ground beef	1.27	1.03	1.21	18.80

<sup>a</sup> Based on the assessment (Module I), the diets of young children in the study community were deficient in iron and zinc.

### Cost analysis

Because the cost of a recipe will affect families' ability to prepare it on a regular basis, the cost should be determined. To assess this, the cost of all ingredients needs to be gathered. To the extent possible, the ingredients used to prepare the dish should be purchased locally (in the same markets or shops that the target population uses) to get a more accurate view of the cost of the recipe for the caregivers.

To be able to compare prices among several dishes, calculate the price per 100 g of each dish, as described in the formula below.

$$100 \text{ g} \times \frac{\text{total price of dish}}{\text{total weight of dish (g)}}$$

The energy and nutrient density of each recipe can be calculated automatically, using the **ProPAN** software, or by hand, using the formulas provided in Matrix for analyzing a recipe's nutritional value and cost (Form II-1.2).

### Acceptability and feasibility analysis

In addition to the nutritional and cost analyses, criteria regarding the acceptability and feasibility of adopting recipes should also be considered when selecting the potential recipes. Some of these criteria include:

- Acceptability by participating caregivers and children
- Number of ingredients used in the recipe
- Time required for preparation and cooking
- Equipment necessary for preparing and cooking the dish
- Availability of the ingredients used (if they are seasonal or available during the entire year)

Matrix for analyzing recipe acceptability and feasibility (Form II-1.3) can be used to analyze recipe acceptability and feasibility. Exhibit C shows sample data from research carried out in Peru.

**Exhibit C. Sample matrix for analyzing recipe acceptability**

Recipe	Number of ingredients	Ingredients	Amount	Preparation time (in minutes)	Caregiver's acceptability	Child's acceptability (including amount consumed)	Positive/negative comments/motivations	Suggested name
Mashed potatoes with squash and chicken liver	5	Potato Squash Chicken liver Oil Broth	1 lb 1 lb 1 lb 3 tsp 1 cup	5	Liked it	Liked it Ate 1/2 cup	Tasty Easy Smooth Nourishes Takes time to feed	Liver vitamin

Source: Hilary Creed-Kanashiro, Instituto de Investigación Nutricional, Peru, personal communication.

Ultimately, a list should be developed using the information gathered in the *Recipe Creation Exercise* summarizing the potential barriers to and facilitators of caregivers' use of the new or modified recipes. This summary can also be used when completing the Matrix for summarizing caregiver motivations (Form II-2.3) and the Matrix for summarizing solutions to barriers (Form II-2.4) for the Test of Recommendations. For example, the following summary was developed based on research carried out in Mexico:

- Caregivers felt the children preferred more liquid recipes, because they ate them faster and better. In addition, they felt that vegetables and meats “leak their essence” into the broth when cooking, and for this reason the broth is also considered nutritious
- According to the caregiver's comments, some foods are classified as either cold (such as meat, squash, rice, beef broth) or hot (such as mango)

- Caregivers used words such as “vitamins, energy, and nutritious.” They felt that there is a relationship between proper feeding and the growth and development of their children
- During the recipe exercises, caregivers would breastfeed their children
- Some caregivers stopped feeding their children when the child said they did not want anymore, but other caregivers insisted a little more until the plate was finished
- For children to have something to drink with the dishes, some caregivers made orange juice and provided it along with the dishes that they prepared
- When the food was too hot, caregivers waited for it to cool while giving rolled-up tortilla “tacos” soaked in broth

**Recipe Creation Exercise Guide (for Form II-1.1)**

1. Meeting date Write the date of the meeting, starting with the day, month, and year. This information can be completed before the meeting. The first nine days of the month should be preceded by a zero (e.g., day 2=02). The months should be indicated by two digits starting with 01 for January and ending with 12 for December.
2. Meeting place Write the name of the community and the specific location where the meeting takes place.
3. Nutritionist or assistant name and code Write your first name and the first letter of your last name. Record your code in the space provided at the right (this code will be assigned to you by the Supervisor).
4. Age group Record the proper age group code using the following definitions:  
01= Caregivers with children 6.0–8.9 months old  
02= Caregivers with children 9.0–11.9 months old  
03= Caregivers with children 12.0–23.9 months old
5. Recipe code Once it is developed, the Supervisor should assign the recipe a unique code.
6. Caregiver names Write the names of the caregivers clearly and in the following order: paternal last name, maternal last name, and first name.
7. Starting time Write the time that the exercise began (i.e., the time that the caregivers begin washing/cutting/preparing the ingredients).
8. Weight of container Record the weight (in grams) of the container in which the caregivers will prepare the dish (i.e., the pan, pot, or other container in which the final dish will be cooked).
9. Name of dish Once the caregivers have decided what they will prepare, ask them the name of the dish, and record it.
10. Recipe content
  - 10.1 Ingredients Write the ingredients used during the preparation of the dish.
  - 10.2 Amount used (household measure) Record the household measure used by caregivers for each ingredient (e.g., 1 cup, 1 piece, ½ tbsp, etc.)
  - 10.3 Amount used (g) Using a food scale, weigh the amounts used of each ingredient (noted in 10.2 above) and write the total weight in grams. If the caregiver uses any additional ingredients after cooking the dish (e.g., water to cool it, spices, or additional foods), remember to weigh all of the ingredients and add them to the dish.
  - 10.4 Edible portion *If the weight of the ingredient is equal to the net weight of the food (e.g., potato without skin, chicken without bone or skin, rice, or avocado without pit), write “Yes” for “Edible portion” (10.4).*
  - 10.5 Cooked versus raw Specify if the food used by the caregiver was previously cooked or not. If the food was previously cooked, write “Yes.” If the food was raw, write “No.”
11. Preparation and cooking method Take careful notes on the preparation and cooking procedure until the dish is finished and ready to be fed to the children.
12. Observations during preparation Record all comments made by the caregivers during the exercise (their reactions, practices, and attitudes, etc.).
13. Finishing time Write the time when the dish is finished (ready to be eaten).

14. Total preparation time Calculate the time that it took to prepare the dish (i.e., how much time elapsed from the starting point, when the caregivers began washing/cutting the foods, as noted in question 7, to the moment the dish was ready to be eaten).
15. Final recipe amounts
  - 15.1 Total weight (g) When the caregivers finish making the dish, weigh it inside the container in which it was prepared, and record the total weight in grams.
  - 15.2 Weight of container (g) Record the weight of the container (pot, pan, etc.) in which the dish was prepared (as determined in question 8).
  - 15.3 Net weight (g) Subtract the amount in column 15.2 (weight of container) from the amount in column 15.1 (total weight) and record the number. This is the net weight of the dish.
  - 15.4 Household measure Record the final volume that the dish occupies in the container (e.g., 1 small pot or  $\frac{3}{4}$  of a large pot).
16. Amounts served and consumed
  - 16.1 Weight of serving utensil (g) Before each caregiver serves the dish to the child, weigh and record the total weight of the cup, bowl or plate in which the caregiver will serve the food to the child (in grams).
  - 16.2 Total weight served (g) Weigh the serving utensil and dish and record the weight (in grams).
  - 16.3 Net weight served (g) Subtract the amount obtained in column 16.1 (weight of the serving utensil) from the amount obtained in column 16.2 (total weight served) and record the number. This is the net weight served.
  - 16.4 Household measure Record the household measure caregivers use to serve the dish to the children (e.g., 4 tbsp,  $\frac{1}{2}$  small dish, 1 large soup bowl, etc.).
  - 16.5 Leftovers weight (g) Once the child has stopped consuming the food, weigh the plate with the leftover food and record the weight (in grams).
  - 16.6 Amount consumed (g) Subtract the amount obtained in column 16.5 (the weight of the food remaining on the plate) from the amount obtained in column 16.2 (total weight served) and record the number. This is the total amount consumed by the child.
17. Consistency of final dish according to caregivers Once the caregiver serves the child, ask her about the consistency of the dish, without suggesting an answer.

If the caregiver's opinion coincides with any of the classifications on the form (liquid, semi-liquid, thick, or solid), write the corresponding code. If the caregiver provides a different classification, write code 77 ("other") and specify the word she used (e.g., write "77" and "goeey").

*Note:* This section contains five different lines that should all be completed. Each line corresponds to the answer of up to five caregivers who are part of the group preparing a specific recipe. Add more lines if more caregivers are expected to participate.

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|---|--|
| 18. Consistency of final dish according to Session Facilitators         | <p>Write the consistency of the final dish as estimated by you (the Session Facilitator), according to the following classification:</p> <p>01 = liquid<br/>02 = semi-liquid<br/>03 = thick<br/>04 = solid</p> <p>Determining the consistency will require inserting a fork or spoon into the food and choosing the code based on the following criteria:</p> <ul style="list-style-type: none"> <li>• If, when removing the fork or spoon, the food is runny, it is liquid = 01</li> <li>• If, when removing the fork or spoon, the food slowly drops off the spoon, it is semi-liquid = 02</li> <li>• If, when removing the fork or spoon, the food does not run, it is thick = 03</li> <li>• If the food can be cut with a knife, it is solid = 04</li> </ul> |
| 19. Observations made while children taste the dishes (“acceptability”) | <p>While the caregivers feed the children, observe and record the children’s reactions (e.g., if they like the dish, if they finish it, etc.). Ask the caregivers what they think about the children’s acceptability (or lack of acceptability) of the new recipe.</p>   |
| 20. Complementary information (discussion)                              | <p>When the observations about acceptability have been made, gather the caregivers and ask their opinions about the recipes. Find out the following:</p> <ul style="list-style-type: none"> <li>• If they might prepare the dishes in their homes in everyday situations</li> <li>• Each caregiver’s opinion about the taste, smell, appearance, and consistency of each dish</li> <li>• Caregivers’ suggestions for the improvement/modification of the dishes prepared</li> </ul>  |
| 21. Additional recipe (optional)  | <p>There may be some dishes that the caregivers know and would have liked to prepare, but for lack of time were not able to do so. At the end of the meeting, ask each caregiver if there is any other recipe (with the characteristics mentioned in the meeting) that she would like to make using the same ingredients.</p>  |

[illegible]

11. Cooking method: (record all steps taken by caregivers to prepare the recipe) \_\_\_\_\_

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12. Observations during preparation and cooking (reactions, comments, etc.): \_\_\_\_\_

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13. Finishing time: \_\_\_\_\_:\_\_\_\_\_

14. Total preparation and cooking time: \_\_\_\_\_:\_\_\_\_\_

15. Final amounts of the dish:

15.1 Total weight (g)	15.2 Weight of container (g)	15.3 Net weight (g)	15.4 Household measure

16. Amounts served and consumed:

Child	16.1 Weight of dish (g)	16.2 Total weight served (g)	16.3 Net weight served (g)
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

17. Consistency of final dish according to caregivers:

01= liquid

02= semi-liquid

03= thick

04=solid

77=other, specify \_\_\_\_\_

17.1. \_\_\_\_ \_\_\_\_

17.2. \_\_\_\_ \_\_\_\_

17.3. \_\_\_\_ \_\_\_\_

17.4. \_\_\_\_ \_\_\_\_

17.5. \_\_\_\_ \_\_\_\_

18. Consistency of final dish according to Session Facilitators:

01= liquid

02= semi-liquid

03= thick

04=solid

77=other, specify \_\_\_\_\_

18. \_\_\_\_ \_\_\_\_

19. Observations made while children taste the dishes ("acceptability"):

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20. Complementary information (gathered during the discussion following the tasting):

- Caregiver opinions about the recipe (e.g., Is it possible to prepare it at home?)
- Opinions about taste, smell, appearance, and consistency
- Suggestions to improve/modify the recipe

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21. Additional recipes recommended by caregivers (optional):

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### Matrix for analyzing a recipe's nutritional value and cost (Form II-1.2)

#### Option 1

Recipe	Ingredients	Consistency (0.liquid, 1. semi-liquid, 2. thick, 3. solid)	Animal source ingredients present (number = 0, 1, 2)	Vegetables present (number = 0, 1, 2)	Additional energy source (0. No, 1.Yes)	Cost per 100 g

#### Option 2

Recipe	Ingredients	Energy density (kcal/g)	Specific nutrient density <sup>a</sup> (unit/100 kcal)	Specific nutrient density (unit/100 kcal)	Cost per 100 g

a Density of nutrients identified as deficient in the diet, such as protein (g), iron (milligrams), zinc (milligrams), vitamin A (micrograms of retinol equivalents), vitamin C (milligrams), or calcium (milligrams). If information on densities for more than two nutrients is desired, more columns can be added with this label.

#### Consistency

If, when a spoon is inserted into and removed from it, the food runs quickly off the utensil, it is liquid. If the food slowly drops off the spoon, it is semi-liquid. If when the spoon is removed the food does not run, it is thick. If it can be cut with a knife, it is solid.

#### Energy density

Energy density is the amount of energy in 1 g of food (expressed in kilocalories). It is calculated using the following formula:

$$\frac{\text{Total kilocalories of food}}{\text{Total weight of food (g)}}$$

#### Nutrient density

Nutrient density is the amount of a nutrient per 100 kilocalories of food (see Glossary). It is calculated using the following formula:

$$\frac{100 \text{ kcal} \times \text{total amount of nutrient in the dish}}{\text{Total kilocalories in final dish}}$$

[illegible]

## Annex II-2: Test of Recommendations<sup>23</sup>

### Objectives

- Determine the acceptability of the recommendations
- Identify which aspects of the recommendations are adopted and which are not.
- Identify barriers to the adoption of recommendations (e.g., lack of skills or resources, or rejection by children)
- Identify facilitators (e.g., knowledge, family support, perceived benefits, and accessibility of resources)
- Document changes and improvements that participants make to the original recommendations
- Obtain information needed to modify the recommendations to make their adoption more feasible
- Identify strategies that can be used to reinforce the adoption of the recommendations

### Product

Once the *Test of Recommendations* is complete, a final list of recommendations to improve infant and young child feeding that are likely to be adopted will be available and summarized in Form II-4.1 in Annex II-4.

### Steps and logistics

#### 1. Preparation and planning

##### Training and standardization of personnel

Supervisors and Field Workers need to be trained and standardized in the specific tasks they will be responsible for.

##### Completing the Motivations Matrix

The purpose of completing the Motivations Matrix is to write all the reasons why the target population would follow the recommendations.

During the *Test of Recommendations*, the research team should work with the recommendations selected in Module I and, if applied, the recipes selected in the Recipe Creation Exercise (Module II). For each recommendation or recipe to be tested, a matrix of motivations (Form II-2.3) must be developed using relevant information from the nutrition assessment in Module I. The form should be filled out listing the factors that motivate participants to follow a recommendation or prepare a specific recipe, using arguments and terminology expressed by the target population during research carried out in Module I and the Recipe Creation Exercise.

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<sup>23</sup> This methodology draws on concepts from the Trial of Improved Practices (TIPs) described in *Designing by dialogue: a program planners' guide to consultative research for improving young child feeding* (Dickin et al, Academy for Educational Development/Manoff Group, 1997).

A sample matrix summarizing caregiver motivation that was used in Malawi is presented in Exhibit D. A different motivation matrix was drafted to address each recommendation.

#### Exhibit D. Sample matrix summarizing caregiver motivations (Malawi)

Recommendation	Motivations
<p>For caregivers of infants 9.0-11.9 months old:</p> <p>Dishes should have a thick consistency and be mashed (e.g., <i>nsima</i><sup>a</sup> with mashed vegetables such as pumpkin, mustard, or sweet potato leaves; pumpkin, sweet potato, tomato, potato).</p> <p>Give the baby a portion of fish, meat (chicken, mouse, goat, beef, pork, rabbit), or insects once per day (at least two tablespoons).</p>	<p>The baby will be happier with thick foods, and you will be able to do your housework with less interruption</p> <p>The meat or fish will help the baby be strong and healthy. He/she will be happier and playful.</p>

a Traditional staple from Malawi composed of water and cornmeal (PATH Infant and Young Child Feeding Project, 2011).

### Presenting the recommendation

It is also important to develop specific messages for the presentation of the recommendation during the first visit. Exhibit E shows a presentation message used to introduce a recommendation to caregivers in Peru.

#### Exhibit E. Sample recommendation presentation for initial visit

<p>The recommendation that I would like to have you test now that the baby is 8 months old is to begin feeding him thick mashed foods. Did you know that:</p> <ul style="list-style-type: none"> <li>• Broths only fill the baby's stomach for a short time. Mashed foods, instead, fill and satisfy him so he will not cry from being hungry. This way you can finish your chores with a little more time on your hands.</li> <li>• It is easy and inexpensive to prepare mashed foods from the foods you prepare for the rest of the family; you do not have to prepare the food for the baby separately.</li> </ul> <p>For example, what are you preparing for... today? From this, you can take... [potato, noodles, rice, carrots, spinach, lentils, beans, chicken liver or a small piece of ground meat] ... and mash it. This way you can prepare a thick mashed food to feed the baby.</p> <ul style="list-style-type: none"> <li>• Eating this way, the baby will grow stronger and be more alert.</li> </ul> <p>I would like to suggest that this week you try to feed the child thick mashed foods during each meal. And remember, the mashed food can be prepared from the foods you have prepared for the rest of the family (e.g., potatoes, noodles or rice).</p> <p>Would you like to try it this week?</p>
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Source: Hilary Creed-Kanashiro, Instituto de Investigación Nutricional, Peru, personal communication.

It is helpful to use materials to motivate the participant to try out the recommended practice. These can be motivational drawings; interactive materials, where the participant has to choose or select a meal or ingredients; or puppets used to demonstrate a behavior (e.g., responsive feeding behaviors).

### Reminder for each recommendation

It is useful to develop a reminder or drawing for each recommendation or recipe, and leave it with the participant during the Initial Visit.

## Solutions guide

During the Follow-up Visit, it will also be useful to have suggestions to help the participant practice the recommendation in spite of problems that she may have encountered. For this, a matrix summarizing solutions to barriers should be developed ([Form II-2.4](#)). A sample matrix of barrier solutions from research carried out with caregivers in Mexico is provided in Exhibit F.

**Exhibit F. Sample matrix summarizing solutions to barriers**

Recommendation: Increase meal frequency	
Barriers	Solutions
"There is not enough time for so many feedings"	Ask the caregiver to try to feed her child only one more time than usual Feed the child an extra fruit If the child is older than 1 year, he/she can eat a fruit or bean taco all by him/herself. Feed the child lunch or dinner when everyone else is eating When his siblings are eating bread or fruit, ask them to share it with the baby
"It is expensive"	Ask the caregiver to feed the baby the same ingredients she feeds the rest of the family
"He cannot tolerate a large dinner; his stomach can get too full. He gets diarrhea if he has too much dinner" "When they have too much dinner they wake up complaining of stomach aches or with diarrhea" "We do not have dinner"	Give only a snack of bread and milk or yogurt. Do not feed heavy foods for dinner.
"She falls asleep before dinner time" "When she eats at night she cannot sleep, her stomach hurts"	Feed the child dinner an hour before bed time

Source: Data from research carried out in Mexico, María Ángeles Villanueva Borbolla, Instituto Nacional de Salud Pública, Mexico, personal communication.

## 2. Selection of participants

Participants with characteristics similar to those to whom the recommendations will be directed (e.g., caregivers of children under 2 years old, health workers, midwives, hospitals directors, village elders) should be selected. They do not have to be chosen randomly and could include individuals who participated in Module I. Each recommendation should be tested by at least six participants. Extra participants should always be selected because it can sometimes be difficult to locate all of the Initial Visit participants during the Follow-up and Final Visits. For example, in Malawi, a total of 29 caregivers of infants 6–8 months old participated in the Initial Visit, but only 21 were found and interviewed in the Final Visit (PATH Infant and Young Child Feeding Project, 2011).

## 3. Materials

### Initial Visit

- Copies of the [Initial Visit Form \(II-2.1\)](#)
- Copies of the [Matrix for summarizing caregiver motivations \(Form II-2.3\)](#)

- Pencils/pens
- Identification cards for staff
- If planning to tape the visit, recorders and batteries
- Clipboard
- Support material to motivate the participant (such as drawings or interactive material) and to help remember the recommendation (such as drawings and recipes)

If a demonstration will be done, it might be necessary to also include:

- Ingredients or food models and pictures
- Food scale to weigh ingredients with a 5 kg capacity and minimum precision of 2 g
- Measuring cup
- Samples of spoons and other utensils/containers used for household measures (e.g., tin cans, bags and bottles)

#### **Follow-up Visit**

- Copies of the Follow-up and Final Visit Form (II-2.2)
- Copies of the Matrix for summarizing caregiver motivations (Form II-2.3)
- Copies of the Matrix for summarizing solutions to barriers (Form II-2.4)
- Pencils/pens
- Identification cards for staff
- If planning to tape the visit, battery-operated cassette player with batteries and two cassettes, or digital recorder with batteries
- Clipboard

#### **Final Visit**

- Copies of the Follow-up and Final Visit Form (II-2.2)
- Pencils/pens
- Identification cards for staff
- If planning to tape the visit, battery-operated cassette player with batteries and two cassettes, or digital recorder with batteries
- Clipboard

Note: If the visits will be taped, one cassette should be provided per participant to ensure all three interviews (Initial, Follow-up, and Final) can be recorded on the same tape.

#### 4. Personnel and time

Because the *Test of Recommendations* is a participatory activity, establishing an open and cordial relationship with the participants is crucial. Thus, it is important that the Field Workers are familiar with the community and have excellent communication and interpersonal skills. These skills are also helpful in exploring beliefs and opinions regarding the practices and recipes being recommended.

To the extent that differences in findings regarding the adoption or rejection of a recommendation may be a function of the quality of interpersonal communication used by different Field Workers rather than a function of the recommendation itself, it is critical that the Field Workers carrying out the tests should be well trained and standardized in this methodology. Preferably, the same field personnel that participated in Module I should be involved in the *Test of Recommendations* because they will already be familiar with the project objectives. If this is the case, four days of training, including field practices, should be sufficient.

During the visits, a Field Worker with good communication skills will:

- Make the participant feel comfortable, not feel that she is being evaluated, and that her comments about and experiences with the recommendation are important,
- Ask open-ended questions instead of leading questions
- Explore in-depth the responses given, and not be satisfied with superficial answers
- Avoid changing the subject too quickly
- Allow the participant to speak uninterrupted
- Be patient and allow time for the participant to think
- Not make promises or create false expectations
- If possible, during the interview, observe the relationship between the caregiver and family members, the caregiver's reactions with the children, the general family life conditions, the family interaction, and the interaction between the health worker and the caregivers and children
- Observe the position, gestures, and attitude of the person being interviewed

The testing of all recommendations through the three visits can be completed in about eight days. However, if sufficient resources and time are available, extending the testing period to 15 days or more will result in a more realistic estimate of the actual adoption of the recommendations by the participants. For example, in Mexico it was observed that numerous caregivers followed the recommendation during the first week, but the frequency of practicing the recommendations decreased during the second week.

The total time required to conduct the *Test of Recommendations* will depend on several factors: the number of behaviors that will be tested, the number of Field Workers, the distance between participants' households, the transportation available to the Field Workers, and participants' availability to meet with Field Workers. One Field Worker should be able to conduct two to three visits per day. Therefore, with six Field Workers, two weeks should be enough time to complete a *Test of Recommendations* with approximately 24 participants. The total time required for Field Worker training plus execution and analysis of the tests is at least three weeks.

## 5. Description and procedures

The *Test of Recommendations* includes three visits: an Initial Visit, Follow-up Visit, and a Final Visit to each of the participants.

### Initial Visit

*Introduction. During the Initial Visit, the Field Worker should explain to the participants how their collaboration helps clarify the level of acceptability of the recommended feeding practices. To ensure good collaboration, Field Workers should always maintain a cordial relationship with each participant and explain the purpose of their visit in clear and simple words. If possible and relevant, participants should be encouraged to invite work colleagues, family members, neighbors and/or friends to go to the join them in the meetings with the research team as this often helps them remember and/or reinforces the recommended practices.*

Exhibit G shows how Field Workers introduced themselves to participating caregivers for a *Test of Recommendations* Initial Visit in Peru.

### Exhibit G. Sample introduction letter for Initial Visit

Good morning.

*My name is Graciela and I work for the Nutrition Research Institute. We are working on a project to improve child feeding of children under 2 years old and we have developed a number of recommendations for caregivers of children in this age group. Before giving the recommendations to all caregivers, we would like to have some caregivers like yourself, help us test the recommendations at home and give us your opinion about them to see if they can truly be followed.*

*We would like to ask you to help us to test a recommendation for one week. I will be back in two or three days and then again after a week so you can tell me your experience with the recommendation and if you were able to follow it or not. I would like to know if this is ok with you and if you would like to help us by participating.*

*I would like you to help us test this recommendation and if something of what I tell you is not clear, please ask me to clarify it. Also, if you have any difficulties following the recommendations, I would like you to give me as much information as possible so we can improve our recommendations. In addition, if you have any ideas on how to improve the recommendation, please let me know. We are very interested in your comments and opinions. Everything that you tell me about when you were able to follow the recommendation and when you were not able to do so is very valuable and will be very helpful.*

Source: Hilary Creed-Kanashiro, Instituto de Investigación Nutricional, Peru, personal communication.

*Collection of baseline information to select recommendations.* In addition to presenting the specific recommendation to the participant, baseline information needs to be collected during the Initial Visit to know about participants' current practices, and avoid giving them a recommendation that they already follow. Thus, it is important for the Field Worker collecting this baseline data to be able to analyze the participant's current practices and choose a recommendation to ask her to do what she is not currently doing. This requires coordination with the Supervisor to ensure adequate numbers of participants testing the required number of recommendations.

The baseline information will be used in conjunction with information gathered at the Final Visit to determine if the desired behavior change was achieved. A form to collect this information (Initial Visit Form, Form II-2.1) and the guide for its application (Initial Visit Guide) are provided at the end of this Annex.

Depending on the recommendations suggested, it might be necessary to add questions to Form II-2.1. For example, in Mexico, specific questions related to the recipes were posed to caregivers, such as "Do

you feed the child thin soups?” To confirm these answers, a simplified food frequency questionnaire emphasizing the ingredients of interest was developed based on the *24-hour Dietary Recall and Anthropometry* (Annex 4 of Module I). This questionnaire was applied only to those caregivers selected to test a new recipe. If they mentioned “feeding a thin soup,” they were selected to test a recommendation related to feeding a semi-solid food instead.

*Presentation of the recommendation.* When a recommendation is being presented to the participant, the motivations (reasons and benefits) to adopt the recommendation should also be presented and discussed. *Form II-2.3* (Matrix for summarizing caregiver motivations) is provided for summarizing these motivations. Exhibit H shows sample data from Peru for the caregiver motivations matrix.

**Exhibit H. Sample matrix summarizing caregiver motivations (Peru)**

Recommendation	Motivations
Give the child liver 3 times a week	The child will be alert, intelligent and will learn what he/she is taught Liver will help prevent the child from becoming anemic
Add milk to the child's food daily You can add 3 spoonfuls of milk to his pudding, stew or purées	This will help the child grow and strengthen his bones
Give Sprinkles™ every other day to the child Prepare the sachet of Sprinkles™ in 2 spoonfuls of thick, solid or semi-solid-food	Sprinkles™ have vitamins which will help the child keep healthy and prevent her from becoming anemic They will help her brain to develop and she will be more alert and intelligent and have a good color (rosy cheeks)

Source: Data from research carried out in Peru. Rossina Pareja and Hilary Creed-Kanashiro, Instituto de Investigación Nutricional, Peru, personal communication.

If the recommendation is a new recipe, or makes reference to an appropriate consistency (e.g., how thick the dish for the child should be), a specific amount of food to give to the child in each meal, or the amount of an ingredient that should be included in a dish (e.g., half a chicken liver), it is very important to demonstrate the preparation of the dish as part of the presentation of the recommendation. However, if the resources necessary for the dish are not available, the use of pictures to explain consistency or amounts may be useful. It is crucial that the participant have a clear idea of what she is being asked to test.

The presentation of the recommendation should be done individually with each participant. This way, the baseline data collection, the selection of the recommendation that will be tested, and the motivation to encourage the participant to adopt it will be individualized and most likely will lead to better results than if done in group. It should be noted that the *Test of Recommendations* is a trial to select the recommendations that will be promoted during an intervention and does not include the testing of communication messages (which is more effective when carried out in groups).

Two or more recommendations can be tested with the same participant. For example, in Malawi (PATH Infant and Young Child Feeding Project, 2011), caregivers with infants 6–8.9 months old were given these recommendations to try: “Stop giving \_\_\_ [mention non-nutritive food or liquid that the caregiver is using]. Instead, give a snack such as half a banana, a piece of sweet potato, a piece of avocado pear, or \_\_\_ [mention any fruit the caregiver may have].”

At the end of the visit, the Field Worker may leave a reminder or drawing of the recommendation(s) with the participant. This will remind the participant to practice the recommendation(s) and the different steps to follow if the recommendation requires it.

### **Follow-up and Final Visits**

In addition to the Initial Visit, two other visits are recommended: a Follow-up Visit during the middle of the test period and a Final Visit at the end of the test period.

*Follow-up Visit.* This should be carried out by the Field Workers to determine the degree to which the participants are following the recommendation or suggested recipe. It is important to note that it might be difficult for a participant to remember details of her experience with the test one week after the Initial Visit. Therefore, a visit during the middle of the testing period is suggested so that the research team can assess whether the participant remembers the recommendation, if she was able to put it to practice or not, and what facilitated or impeded her to carry out the recommendation. The *Follow-up and Final Visit Form (II-2.2)* should be filled out during this visit.

It is important to evaluate the probability that the participant will continue the new practice, and if low, motivate her to continue the test. However, if the participant refuses to continue the test, the Field Worker should thank her for trying and take notes of her reasons for not complying with the recommendations.

If the participant is not able to remember the recommendation during the Follow-up Visit or has some reservations that have kept her from trying it, the Field Worker will need to explain it to her again so that she can follow the recommendation during the remainder of the testing period. The Follow-up Visit is also useful to demonstrate to the participant how to practice the recommendation, help her with the skills needed for its practice, and to identify other ways to support her. For this, the Field Worker should rely on the *Matrix for summarizing caregiver motivations (Form II-2.3)* and the *Matrix for summarizing solutions to barriers (Form II-2.4)*.

*Final Visit.* At the end of the testing period, a Final Visit should be made to all participants to obtain their impressions, experiences, and comments regarding the recommendation or recipe that was tested. The *Follow-up and Final Visit Form (II-2.2)* should be used to record the information for this visit. The *24-hour Dietary Recall and Anthropometry*, food frequency questionnaire, or any other questionnaire developed by the research team should be re-applied to assess if the participant followed the recommendation.

The purpose of the Final Visit is to determine what the participant understood and remembered about the recommendation, if they put it to practice or not, how many times they practiced it, how it was carried out each time, what modifications were made, what problems were encountered, what motivated or enabled them to comply with it. In addition, they should be asked if they have suggestions about how to communicate the recommendation more effectively to other members of the target population.

## **6. Analysis**

The analysis of the *Test of Recommendations* is conducted by organizing the data into a matrix to summarize the results, applying the feasibility and compliance criteria, and finally applying the feasibility and impact criteria. The required criteria are feasibility and compliance. Impact is optional, to be done if there is a need to confirm the results of Module I or if the analysis was not done.

## Summary of Results

The first analysis of the *Test of Recommendations* is descriptive. A summary of the results is organized by writing the answers to the questions to the *Follow-up and Final Visit Form* (Form II-2.2) into the *Matrix for analyzing Test of Recommendations results*, (Form II-2.5). Exhibit I is an example of a matrix completed using data from Peru.

### Exhibit I. Sample matrix for analyzing Test of Recommendations results

Recommendation	Remembered	Execution	Modification	Facilitators	Barriers	Intention to continue
Feed thick purée before soup	Yes, remembered the recommendation	Executed	None	It is easy It is more nutritious Soup is not nutritious	When money is an issue, it is difficult to add everything to the purée	Has intention to continue

Source: Hilary Creed-Kanashiro, Instituto de Investigación Nutricional, Peru, personal communication.

Matrices should be completed and analyzed for each recommendation tested by each participant, consolidating the information from all of the individuals who participated in the test. These summary matrices will be used to rank recommendations and to select the final recommendations.

In general, it has been observed that the facilitating factors are related to the ease of putting the recommendation to practice, the perceived (positive consequences) or expected benefits (motivations), the skills, and the support of family members or colleagues, among others. The obstacles deal with the lack of actual or perceived time, lack of knowledge, skills, or awareness, the elevated cost, particular child's characteristics (illness, lack of appetite, etc.), the child's acceptability (he/she liked it or not), or situations perceived as out of the participant's control (e.g., other people decide what to feed the child, etc.).

### Analysis of compliance, feasibility and impact

The selection of the recommendations that will be included in the intervention plan (*Module III*) should be done according to the participants' compliance with the recommended practice, the feasibility of continuing the recommended practice, and the positive impact the recommended practice will likely have on the nutrition of young children.

To evaluate the recommendations according to these criteria, the first step is to fill out a matrix (see the *Matrix for analyzing compliance and feasibility of tested recommendations*, Form II-2.6) using quantitative and qualitative information about participants' compliance with each recipe or recommendation being tested and the feasibility of their adoption of it.

Compliance is defined as the combination of:

- Percent of participants who put each recommendation to practice
- Number of times per week they practiced them
- If it is a recipe, number of times per day they fed the dish it to the child
- Child's acceptability of the new dish

Feasibility refers to the following criteria (described in greater detail in the data analysis section of Step 4 in [Module I](#)):

- Positive and immediate consequences perceived by the participant
- Compatibility with existing beliefs and knowledge in the population
- Cost in economic resources for the participant
- Cost in time and effort to the participant
- Complexity of the recommended practice

Exhibit J shows a matrix that was very useful for selecting final recommendations for caregivers in Mexico.

### Exhibit J. Sample matrix for analyzing compliance and feasibility of tested recommendations

	Criteria	Noodle purée with liver	Vegetable purée with liver	Give foods with smaller servings of broth	Increase the number of meals per day
Compliance	% who put recommendation into practice	100%	64%	82%	82%
	No. of times/week they put it into practice	1 or 2 times a week	1 time every 2 weeks	Foods were not always given with broth	Few put it to practice every day
	No. of times/ day they fed it to the child	2 times a day (lunch and dinner)	1 time a day	Does not apply	Does not apply
	Child's acceptability	Very good acceptability. Giving him/her liver too often may bore him/her	<i>Not all children liked it because of the vegetables.</i> <i>Giving liver too often may bore him/her</i>	Good acceptability	Good acceptability
Feasibility	Perceived positive consequences	Nutritious and good for her growth	Nutritious. Good if the child is sick	His/her health and digestion improved Was no longer hungry	She was happier and her health and weight improved
	Compatibility with beliefs and knowledge	Noodle purée is good for children Chicken liver is good for small children	Vegetables have vitamins and are good for the child's digestion Chicken liver is good for small children	There is a set belief that the <i>substance</i> is in the broth and not in the <i>solid food</i> .	Too much food may be harmful to the child. It is the child who decides how much and when to eat
	Cost in economic resources	Inexpensive and accessible	Inexpensive	Does not increase expense	Increases expenses
	Cost in time and effort	Little time	Effort to find vegetables	Takes time	Too much time and effort
	Complexity	Does not seem complex	Does not seem complex	It is easier to serve broths and liquids than solids	Depends on the child's appetite and the caregiver's activities

Source: Data from research carried out in Mexico, María Ángeles Villanueva Borbolla, Instituto Nacional de Salud Pública, Mexico, personal communication

Once the results are organized in matrices like the one described in the table above, the data should be analyzed by applying the feasibility, and impact criteria (see [Form I-10.4](#) of Annex I-10) to the recommendations that were tested and to those that were not tested but will be included in an intervention. The results of the *Test of Recommendations* will provide a clearer idea of the feasibility of each recommendation. Based on this analysis, three to five recommendations deemed to have potential for adoption should be selected. These recommendations will form the basis of an intervention to be designed during the application of [Module III](#).

### **7. Sample application of Test of Recommendations**

In a project in Guatemala, the following recommendations were tested with caregivers after having been ranked using the data analysis described in Module I (Rivera et al., 1998).

- Increase feeding frequency giving the child three main meals and two snacks, one at mid-morning and one at mid-afternoon. In addition, “good” snacks were suggested, such as sweet bread, banana or other fruit, and thick *atole*<sup>24</sup>.
- Combine certain foods in each meal, giving the child at least two basic foods such as black beans, rice, noodles and egg. Always serve these foods with a corn tortilla.
- Increase the amount of food, giving the child one more spoonful than usual of beans, rice, or noodles. Give children less than 1 year old half a corn tortilla and children more than 1 year old at least one corn tortilla at each meal.
- Help the child eat by spoon-feeding the child under 1 year old and helping and motivating older children to finish all the food served.

Each recommendation was evaluated using the *Test of Recommendations* with six caregivers for a period of five days. Most of the caregivers put the recommendation to practice during the five days. However, when comparing results, the recommendation most feasible to adopt was “Increase the frequency of consumption each day” (particularly for children older than 8 months old). The most difficult recommendation to adopt was “Give combinations of dishes,” because it was difficult to remember and it seemed complex to the caregivers. Also, the recommendation about “Amount to feed” was difficult to adopt, especially because children were not able to eat the amount of tortilla suggested. Finally, the caregivers were able to help their children eat; and those who tried to increase the frequency of consumption each day spontaneously stated that to achieve it they had to help their children eat.

The data were analyzed again using the feasibility of adoption and potential impact criteria. The following recommendations were tested:

- A. “Increase the daily frequency of mealtimes”
- B. “Mix certain dishes at each meal”
- C. “Increase the amount of food served at each meal”

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24 Cereal-based drink often consumed in Central America and also given to young children.

D. “Help the child to eat”

E. “Increase the daily frequency of meals during diarrheal illness and recovery”

F. “Increase the amount of food served during diarrheal illness and recovery”

It should be noted that the last two recommendations were not evaluated in the *Test of Recommendations* because of the implicit difficulty in finding children with diarrhea or in the recovery period after having had diarrhea.

In the data analysis, increasing the daily frequency of mealtimes (Recommendation A) received the highest score for feasibility of adoption, followed by the maternal practice of helping the child to eat (Recommendation D). Meanwhile, increasing the amount of food served (Recommendation C) received the highest score for potential impact, but the lowest score for feasibility of adoption. Moreover, it was considered more feasible to increase the daily frequency of foods during diarrhea and the recovery period (Recommendation E) than to increase the amount of food served during a diarrhea episode or recovery period (Recommendation F).

Therefore, the final selected recommendations were: “Increase the daily frequency of mealtimes (three formal meals and two snacks)” (Recommendation A), and “Help the child to eat” (Recommendation D). The social communication intervention was designed around these two recommendations.

## Initial Visit Guide (for Form II-2.1)

### I. Introduction

Before posing the questions, the Field Worker should introduce him/herself to the participant and ask for her consent to participate in the study. As when applying Module I, the request for consent can be verbal or written (see the sample [Consent Letter and Form, Form I-2.1](#), in Annex I-2). The objectives of the study and the interest in the individual's participation should be explained in simple terms.

### II. Questions

- |   |  |
|---|--|
| 1. Date of interview  | Write the date in which the Initial Visit is carried out, starting with the day, month, and year. The months should be written using a progressive code that goes from 01 for January to 12 for December. For the first nine days of the month, a zero must be written before the number (e.g., day 2 = 02).   |
| 2. Field worker's name and code   | Write your name and the first letter of your paternal last name, and your code (which should be assigned by the Supervisor).   |
| 3. Participant's name   | Write the participant's name clearly in the following order: paternal last name, maternal last name, and first name.   |
| 4. Location   | Write a detailed description of where you met the participant. Note any landmarks and other reference points that may facilitate finding the location in future visits.  |
| 5. Evaluation of whether or not recommendation is currently followed              | Using the questions or forms developed by the research team, determine if the participant already practices the recommendation that she will test. In practice, this will likely require modifying the form and adjusting the numbering of the questions accordingly. If she already practices the recommendation, ask her about another recommendation that will be tested. Continue asking the questions until you find a recommendation that she is not currently practicing. |
| 6. Recommendation that will be proposed   | Write down the recommendation that will be proposed to the caregiver for testing.  |
| 7. <i>What do you think of the recommendation?</i>                                | The purpose of this question is to determine the participant's initial reaction to the recommendation.<br>Ask the participant what she thinks of the recommendation and record her reactions.  |
| 8. <i>Would you like to change it in some way? How?</i>                           | The purpose of this question is to determine if the participant would like to change the recommendation in some way to improve it or make it easier to put to practice. In addition, the question asks how the participant would like to change the recommendation.  |
| 9. <i>Have you heard anything about a recommendation like this before? Where?</i> | The purpose of this question is to determine if the participant has heard anything about the recommendation and if so where she heard it.  |

- |   |   |
|---|---|
| <p>10. <i>Have you done something similar to this recommendation before? What did you do?</i></p> | <p>The purpose of this question is to determine if the participant has practiced a similar recommendation and to record which practice it was and how it was similar to the recommendation.</p>   |
| <p>11. <i>Do you think you could put this recommendation to practice? Why? Why not?</i></p>       | <p>The purpose of this question is to determine if the participant thinks she can comply with the recommendation and why she thinks that way.</p>   |
| <p>12. <i>Do you have any doubts about the recommendation?</i></p>                                | <p>The purpose of this question is to determine if the participant has any doubts about the recommendation, how she would put it into practice, and the frequency with which she should practice it. In addition, this question will give the Field Worker the opportunity to increase the participant's confidence in practicing the recommendation, using the Matrix for summarizing caregiver motivations (Form II-2.3).</p> |
| <p>13. Observations</p>   | <p>Write any information needed to clarify or facilitate the interpretation of any answer given by the participant.<br/>Record any problems encountered while conducting the interview.<br/>If more space is needed to record the answer to any of the previous questions, use this section for that purpose.</p>   |
| <p>14. <i>What days and times would be convenient for future visits?</i></p>                      | <p>The purpose of this question is to determine which days and times are convenient for the participant for the Follow-up and Final Visits.</p>   |

### **III. End of interview**

Thank the participant for answering the questions and explain that you will be return later to hear her opinions about the recommendation. Leave some type of reminder or drawing of the recommendation, if available.

**Initial Visit Form (Form II-2.1)**

1. Date of interview: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
                                    day    month    year

2. Field worker's name: \_\_\_\_\_ Field worker's code: \_\_\_\_\_

3. Participant's name: \_\_\_\_\_

4. Location: \_\_\_\_\_

\_\_\_\_\_  
(Street, avenue, kilometer and/or alley, house number, neighborhood, section, etc.)

5. Evaluation of whether or not recommendation is currently followed: (using questions or forms developed by the research team):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Recommendation that will be proposed:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. *What do you think of the recommendation?*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. *Would you like to change it in some way? How?*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. *Have you heard anything about a recommendation like this before? Where?*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10. *Have you done something similar to this recommendation before? What did you do?*

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11. *Do you think you could put this recommendation into practice? Why? Why not?*

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12. *Do you have any doubts about this recommendation?*

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13. Observations:

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14. Days and times available for possible visits:

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15. The final, agreed-upon recommendation the person will test:

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## **Follow-up and Final Visit Guide (for Form II-2.2)**

### **I. Introduction**

As a general rule, Field Workers should avoid reading questions word by word. Instead, they should try to establish a natural conversation with the participant. The conversation should cover the participant's experience with the new recommendations, and her reactions to it; her willingness to continue the practice; and any changes made to the recommendation.

The following questions can be used as a guide to what types of topics should be covered with the participant:

- *To what extent were you able to follow the recommendation? Why?*
- *How did you feel about this experience (was it difficult or easy to practice the new recommendation)?*
- *Did you modify the recommendation? If so, how and why?*
- *What did other people think of the recommendation? Why?*
- *Do you plan to continue applying the recommended practice? Why? Why not?*

After introducing themselves to the participant, the Field Workers should explain that they are interested in knowing if the practice worked or not, and proceed with the interview.

*Note:* During the Follow-up Visits, the matrix for summarizing solutions to barriers (Form II-2.4) can be referred to for suggested solutions to common problems caregivers may face in adhering to the recommendations.

### **II. Questions**

The *Follow-up and Final Visit Form* (Form II-2.2) is designed so that each recommendation has its own column. Therefore, if two recommendations are tested with the same caregiver, they can both be assessed in the same matrix.

- |   |   |
|---|---|
| 1. <i>Date of interview</i>   | Write the date of the Follow-up or Final Visit (day / month / year). Months and days should be written as two-digits (e.g., "01" through "12" for Jan–Dec and "02" for "Day 2").  |
| 2. <i>Field worker's name and code</i>  | Write your name and the first letter of your paternal last name, and then write your code (this should have been previously assigned by the Supervisor).  |
| 3. <i>Participant's name</i>  | Write the participant's name clearly in the following order: paternal last name, maternal last name, and first name.  |
| 4. <i>Recommendation tested</i>   | Write out the recommendation that the participant agreed to test during the Initial Visit.  |
| 5. <i>Do you remember the recommendation? What did it say?</i>  | This question refers only to whether or not the participant remembers the recommendation given during the Initial Visit (not whether she has put it into practice).   |
| 6. <i>Evaluate if the participant has been practicing the recommendation, and if so, the frequency with which she has practiced it, and/or why she has/has not practiced it</i> | The purpose of this question is to evaluate if the participant followed the recommendation given during the Initial Visit, how many days or times she practiced it, and why. Any questions or forms developed to evaluate compliance with the recommendation should be applied (e.g., if the recommendation is to feed the child a serving of egg, fish, or meat daily, evaluating compliance might include use of a qualitative 24-hr recall or direct observation). |

- |   |   |
|---|---|
| 7. <i>How did you feel practicing the recommendation?</i>                                     | The purpose of this question is to determine the participant's reactions to her experience practicing the recommendation.   |
| 8. <i>What did you like about the recommendation?</i>   | The purpose of this question is to determine what the participant liked about the recommendation or about practicing it.  |
| 9. <i>What did you dislike or find difficult about the recommendation?</i>                    | The purpose of this question is to determine what the participant disliked or found difficult about the recommendation itself or practicing it.   |
| 10. <i>Do you think the child liked it or not? Why?</i>                                       | The purpose of this question is to evaluate the child's reaction to the recommendation and document her reaction.   |
| 11. <i>Did anyone say anything to you about the recommendation? Who? What did he/she say?</i> | The purpose of this question is to determine if family members, neighbors, colleagues, patients, friends, or anyone else said anything to the participant about the recommendation, and if so, who they were and what they said.  |
| 12. <i>Did you change the recommendation? What did you change? Why did you change it?</i>     | The purpose of this question is to determine if the participant made any changes to the recommendation, and if so, which ones, and why.   |
| 13. <i>Are you willing to continue practicing this recommendation? Why? Why not?</i>          | The purpose of this question is to determine if the participant intends to continue practicing the recommendation and why or why not.   |
| 14. Observations  | Write any information that could help clarify or facilitate the interpretation of any answer in the space provided. Be sure to include the relevant question number(s).<br>This space may also be used to describe any factors that may have obstructed or impeded the interview.<br>If more space is needed to record the answer to any of the questions above, use this space to complete it. Be sure to include the relevant question number(s). |
| 15. Days and times available for the Final Visit  | The purpose of this question is to determine which days and at which times it is more convenient for the participant to have the Field Worker return for the Final Visit.   |
| Include the following question in the Final Visit:  |   |
| 16. <i>What would you say to your neighbor to recommend that she follow this practice?</i>    | The purpose of this question is to become more familiar with local terminology, expressions, and reasoning to improve the promotion of the recommendations. This information can also be applied in developing the intervention (Module III).   |

*Note:* During the Follow-up Visits, the Matrix for summarizing solutions to barriers (Form II-2.4) can be referred to for suggested solutions to common problems caregivers may face in adopting the recommendations.

### **III. End of interview**

Thank the participant for her collaboration. If the second Follow-up Visit (the Final Visit) has not yet been completed, decide on a mutually convenient time to return to the household.

## Follow-up and Final Visit Form (Form II-2.2)

1. Date of interview: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ 2. Field worker's name and code: \_\_\_\_\_  
 day month year

3. Participant's name: \_\_\_\_\_

Question	Response for Recommendation 1	Response for Recommendation 2
4. Recommendation tested:		
5. Do you remember the recommendation? What did it say?		
6. Evaluate if the participant has been practicing the recommendation, the frequency with which she has practiced it, and why she has/has not practiced it. (Also, use any questions or forms that may have been developed to evaluate compliance or rejection of the recommendation.)		
7. How did you feel practicing the recommendation?		
8. What did you like about the recommendation?		
9. What did you dislike or find difficult about the recommendation?		
10. Do you think the health professional, caregiver, or child liked it? Why or why not?		
11. Did anyone say anything to you about the recommendation? Who? What did they say?		
12. Did you change the recommendation? What did you change? Why did you change it?		
13. Are you willing to continue practicing this recommendation? Why? Why not?		
15. Days and times available for the Final Visit:		
Note: The following question should only be asked during the Final Visit:		
16. What would you say to your neighbor/colleague/friend to recommend that she follow this practice?		

[illegible]

**Matrix for summarizing solutions to barriers (Form II-2.4)**

Recommendation: \_\_\_\_\_

Barriers	Solutions

Matrix for analyzing results of Test of Recommendations (Form II-2.5)

Recommendation	Remembered	Execution	Modification	Facilitators	Barriers	Intention to continue

Matrix for analyzing compliance and feasibility of tested recommendations (Form II-2.6)

		Recommendation						
	Criteria	1	2	3	4	5	6	7
Compliance	% who put recommendation into practice							
	No. of times/week she put it into practice							
	No. of times/day she fed it to child (recipe)							
Feasibility	Child's acceptability (recipe)							
	Perceived positive consequences							
	Compatibility with beliefs and knowledge							
	Cost in economic resources							
	Cost in time and effort							
	Complexity							

## Annex II-3: Focus Groups (optional)<sup>1</sup>

### Objectives

The objectives of the *Focus Groups* methodology are as follows:

- Resolve doubts and/or inconsistencies regarding the information collected during the Assessment (Module I) and Test of Recommendations
- Confirm the likelihood that the target population will adhere to the recommendations that were modified after applying the Test of Recommendations (and the optional Recipe Creation Exercise, if carried out).

### Steps and logistics

#### 1. Preparation and planning

Prior to conducting a *Focus Group* the following tasks must be carried out: identifying the participants; determining and scheduling a meeting time convenient for all participants; finding and securing a comfortable place to hold the discussion sessions; inviting the participants and reconfirming their attendance prior to the session. This process could take two to four days per *Focus Group*.

In addition, a guide must be developed and produced specifically for the *Focus Group*, based on the topics to be covered and the main questions to be asked during the sessions.

Finally, all Supervisors, Field Workers, and any other individuals involved in this research methodology must be trained and their specific tasks standardized.

#### 2. Selection of participants

The selection of participants for the *Focus Groups* depends on its purpose (e.g., to clarify apparently contradictory results from the *Test of Recommendations* or to elucidate issues related to carrying out a specific recommendation). The selection of participants does not have to be random.

In general, there should be 6–8 participants for each *Focus Group*. To ensure this number of participants is obtained, it may be necessary to invite about 10–15 people, depending on the response of the study community to the project.

The invitation may be done verbally, directly with the person being solicited to participate; written, using an invitation card; or a combination of both. The invitation card should include the name of the person who is invited, the place where the session will be held, and the time the group will meet.

The number of *Focus Groups* that are held will depend on the information that needs to be collected. At least two *Focus Groups* are recommended for each topic.

<sup>1</sup> More guidance on how to prepare, conduct, and analyze focus groups can be found in A manual for the use of focus groups (Dawson & Manderson, 1993; English and French versions), [www.inffoundation.org](http://www.inffoundation.org).

### **3. Materials**

- Copies of the *Focus Groups Form* (Form II-3.1)
- Notebook for taking notes
- Pens/pencils
- Clipboard
- Identification cards for staff
- Name tags and markers
- Snacks
- [If the Moderator is planning on taping the session:] Battery-operated cassette player with batteries and two empty cassettes, or a digital recorder with batteries

### **4. Personnel, site, and time frame**

Planning and implementing a productive *Focus Group* requires a minimum of one Moderator and two Note-takers. Their tasks are as follows:

#### **Moderator**

Moderating a *Focus Group* is not an easy task. A skilled Moderator will have a good understanding of group dynamics techniques as well as the subjects to be discussed. The Session Facilitator who participated in the nutrition assessment in Module I (Step 4) may be a possible candidate.

#### **Note-takers**

To obtain the most precise information possible, the Note-takers should be trained to listen to and record *Focus Group* discussions, and be perceptive about participants' attitudes and opinions during the session.

If there are no research team members with these characteristics, it may be necessary to hire outside experts.

It is common for caregivers to bring children to the session due to lack of a babysitter. Therefore, it is recommended that someone on the research team be designated to take responsibility for any children at the *Focus Group* session site whenever caregivers participate, and to have toys on hand. If possible, participants should be asked beforehand to attend the session without their children.

Each *Focus Group* session should be conducted in a comfortable and private site with minimal risk of interruption. If possible, any child care areas should be separate from the area where the discussion will take place. Ideally, the site should have good ventilation and lighting. The seats should be similar for everyone (participants and Moderator) and arranged in a circle with nothing in the middle.

Only one *Focus Group* session should be held per day. The discussion should last no longer than 1.5 hours.

### **5. Description and procedures**

The Moderator should take responsibility for posing the questions listed in the Question Guide developed for the session and inquiring about the reasons behind participants' opinions and the behaviors

they describe. The Note-takers should record the most pertinent comments (if acceptable to participants; see *Purpose and procedure*), and, after the session, use the tape recording and the Moderator's notes to expand and complement their notes.

### Welcome

It is important to greet and welcome the participants to help them feel comfortable and willing to participate with enthusiasm and trust. To accomplish this, the Moderator should always do the following:

- Greet the participants and thank them for attending the meeting
- Assure them that their presence is important and thank them in advance for the opinions and comments they will give during the meeting
- Explain that there are no right or wrong answers
- Provide a general explanation of the reasons for the meeting.

The example below may be used as a guide for explaining the objective of the *Focus Group*:

*We have invited you here because we would like to learn about infant and young child feeding practices in [name of community]. [If the participants are caregivers, the following line or something similar can be added:] Who better than you, the caregivers in charge of feeding your families, to talk about this ... !*

### Introduction

The Moderator and Note-takers should always introduce themselves to the group. The sample introductions below are from *Focus Group* discussions with caregivers carried out in Peru.<sup>1</sup>

*To get to know each other better, each of us is going to introduce herself. My name is Rosario and I am from Concepción, a beautiful little town in the Mantaro Valley, near Huancayo. I have two children—Ruben who is 9, and Ururi who is 6—and I hope to have two more.*

*I am Hilaria, from a little town in [...] but not as beautiful as [...]! I have a baby, but my baby is 20 years old! Ok! Now it's your turn ... . Who would like to start?*

Encourage the participants to introduce themselves one at a time until all have done so. The introductions may be used to gather miscellaneous information about the participants (e.g., number of children, age of youngest child, workplace, age, education, etc.).

Write the name of the participants on the *Focus Groups Form (Form II.3-1)* and assign a code for each one. This code can make it easier and faster to record the information.

### Purpose and procedure

It is important to explain to the participants how the session will be conducted. For a session with caregiver participants, the example below may be used as a guide:

<sup>1</sup> Hilary Creed-Kanashiro, Instituto de Investigación Nutricional, Peru, personal communication.

We are here to learn about infant and young child feeding in [name of community]. It is you, the caregivers, who will teach us. This is why it is very important that all of you participate. This will be a conversation. There is no set order; we cannot tell you “start here” and “end there.” Any one of you may start, anyone may follow, and we may contradict ourselves. It is important that all of you give us your opinions and listen to the opinions of the others present. All of your thoughts are welcome; there are no bad or incorrect opinions.

Any use of a tape recorder should be explained to the participants. This may be phrased as follows:

*Your opinions are important to us, so we are going to record your responses to make sure that we do not miss anything. Our friends [names of Note-takers] will be taking notes, but if they cannot write everything down, we will use the tape recording as a back-up and listen to it later.*

### General discussion

The Moderator should have a copy of the Question Guide developed by the team and be very familiar with the content. It is recommended that Moderators not read each question. The sequence of the questions presented does not have to match that of the Guide. In fact, in some cases, it may be preferable to change the sequence based on the flow of the conversation. Sample *Focus Group* questions are shown in Exhibit K.

### Exhibit K. Sample Focus Group questions assessing target population’s potential adherence to a recommended practice

Recommendation to be assessed:	Target population:
Grandmothers should help daughters and daughters-in-law by doing one or more of their daily chores	Grandmothers who would be able to comply with the recommendation (e.g., they live with or near to their daughters-in-law, they are in good health)

Objective	Question
Determine whether or not the target population will comply with the recommendation	<i>We spoke with many young caregivers who said they did not have time to patiently feed their babies because they had many household chores to complete. We thought grandmothers could help their daughters and daughters-in-law have more time to feed their grandchildren. Specifically, we thought that grandmothers could help by doing one or more of the chores their daughters and daughters-in-law do each day. Do you think that grandmothers in this community would be willing to complete one or more of the household chores usually carried out by their daughters and daughters-in-law? Do you think they would be able to do these household chores daily? For how long do you think grandmothers would be willing to do these chores for their daughters and daughters-in-law? [List various time periods in days, weeks, months, agricultural seasons, etc.] Do you think that if grandmothers could do these chores for [the time specified above], their daughters and daughters-in-law would spend more time caring for and feeding the babies?</i>
Identify ways to promote the recommendation	<i>There seems to be agreement among you that this is a recommendation that grandmothers could follow. How would you convince your neighbor to do this? What would you say to her? Would [list religious leaders, village leaders, grandfathers, etc.] be able to convince grandmothers to do this? Would two volunteers like to practice describing the recommendation to someone else, and reacting to it?</i>

To improve the flow of the conversation, the Moderator should try to use the same expressions as the participants. The example below can be used as a guide:

*Sumitra said that it is foolish for a woman her age to fetch well water or timber for cooking. Are there chores inside the home that a woman your age could do?*

The Moderator and Note-takers should be attentive to mumbled words, gestures, body movements, head movements indicating agreement or disagreement with something that has been said, and conversations among participants, and should further explore their content. It is by paying attention to details that the best information is obtained. The following examples show how the Moderator can probe further based on these types of cues:

*I heard Sabra telling Fatima that when she was a young mother she only did her chores two or three times per week instead of every day. Can you tell us more about that, Sabra?*

*I thought I heard someone around here say that during bean harvest, all adults in the village are busy, so no one can take on extra chores.*

*When Sunny was suggesting that the village pharmacist could help convince grandmothers to do more of their daughters' chores, Keiko shook her head "No." Who do you think would be a good person to convince grandmothers of this, Keiko?*

## Conclusion

When all of the questions have been asked, the Moderator should summarize what was said and ask if anyone wants to add something else to the discussion. This time may be used to clarify any doubts the participants might have about the recommendations.

## Snacks

When finished, a snack may be served. Snack time may be used as a time to carry out various tasks, including the following:

- Conducting brief discussions between the Moderator and the Note-takers to determine if anything was left unresolved or unclear, and if so to resolve/clarify the issues with the participants before they leave
- Approaching various participants and asking them to clarify issues that do not require group participation (e.g., information about age or occupation)
- Conversing with the participants who spoke the least
- Listening to the participants talk among themselves about infant and young child feeding.

## Departure

It is important to thank all of the participants for both their time and their comments and opinions. When the participants begin to rise from their seats, the Moderator should approach the door to personally say good-bye to each one individually.

It is important to remember that respect and cordiality in the words and gestures of the Moderator and Note-takers are crucial for the success of the *Focus Group*.

## 6. Data integration and analysis

Integration and analysis of the data generated by the *Focus Groups* is based on the use of the Matrix for analyzing *Focus Groups output* (Forms II-3.2), similar to the method used for the Semi-structured Interviews (Annex 8, in Module I). The ultimate structure and format of each matrix depends on the topics covered in each *Focus Group*. Summarizing the information collected (participants' reasons for current practices, and their knowledge of and/or positive or negative attitudes toward the recommended practices) for each of the recommendations and the questions included in the Question Guide is a good starting point. The number of participants that gave each answer included in the matrix should be recorded so that the responses can be ranked in terms of their prevalence among the *Focus Group* participants.

## Product

The desired product of *Focus Groups* is a better understanding of the acceptability of the recommendations modified during the *Test of Recommendations* and *Recipe Creation Exercise* (if applied).

**Focus Groups Form (Form II-3.1)**

1. Focus Group number: \_\_\_\_

2. Date of Focus Group: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
day / month / year

3. Meeting place: \_\_\_\_\_

4. Moderator's name and code: \_\_\_\_\_ / \_\_\_\_

5. Note-taker's name and code: \_\_\_\_\_ / \_\_\_\_

6. Participants' information:

Name	Age	Other information (eg, number of children)	Age of youngest child

7. Start time: \_\_\_\_\_:\_\_\_\_\_

8. End time: \_\_\_\_\_:\_\_\_\_\_

9. Topics to cover during the Focus Group:

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10. Observations and comments about Focus Group

- Participation level
- Group dynamics
- Was subject covered as planned?
- Other

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**Matrix for analyzing Focus Group output (Form II-3.2)**

Recommendation / Question	Knowledge, reasons, and attitudes

## Annex II-4: Final recommendations

The final (tested) recommendations should be listed in the matrix below.

**Matrix for listing final recommendations (Form II-4.1)**

Final recommendations

## References

- CREED-KANASHIRO, H., FUKUMOTO, M. N., JACOBY, E., VERZOSA, C., BENTLEY, M. E. & BROWN, K. H. (1991) Use of recipe trials and anthropological techniques for the development of a home prepared weaning food in the Central Highlands of Peru. *Journal of Nutrition Education*, 23, 30-35.
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- PATH INFANT AND YOUNG CHILD FEEDING PROJECT (2011) *Consulting with caregivers. Formative research to determine the barriers and facilitators to optimal infant and young child feeding in three regions of Malawi*. Washington DC, PATH.
- RIVERA, A., SANTIZO, M. C. & HURTADO, E. (1998) *Diseño y evaluación de un programa educativo para mejorar las prácticas de alimentación en niños de 6 a 24 meses de edad en comunidades rurales de Guatemala*. Washington, DC, Organización Panamericana de la Salud.



## Developing the Intervention Plan

### Purpose

This module will help the research team review the information collected and analyzed in Assessment (Module I) and Test of Recommendations and Recipe Creation Exercise in Module II) to develop an intervention plan. The intervention plan should describe the most adequate intervention to address the problems related to the diet and feeding of children under the age of 24 months identified in the Assessment and, taking into consideration any facilitating factors (facilitators) of or obstacles (barriers) to the adoption of the recommendations at household, community, and institutional levels.

In this module, an intervention is defined as a set of strategies and activities planned and designed to change the behaviors of the target population (e.g., caregivers of children under 24 months old, health workers, etc.) by modifying the factors that influence them (enhancing facilitators and diminishing barriers) and promoting the final recommendations selected in Module I and Module II.

This module is intended to also benefit program planners who have not applied Module I or Module II but who already have the required inputs to design an intervention plan, providing step-by-step guidance to help them in this process.

### Product

Upon completion of this module, the research team will have a specific plan for implementing an intervention to improve dietary and feeding practices in children under the age of 24 months. The plan will comprise of intervention objectives, strategies, materials, and means of implementation.

### Steps

Designing the intervention plan requires completion of the five following steps:

1. Review of the main results of the research carried out in Module I and Module II, including the reports and summary matrices
2. Identification of the recommendations to be promoted in the intervention
3. Identification of all possible intervention strategies
4. Selection of the interventions the program will be able to implement, given available material and human resources

5. Design of a detailed list of activities to be carried out for each intervention, including monitoring and evaluation (covered in Module IV)

### Step 1. Review the research results

Before applying this module, it is useful to complete a matrix summarizing the findings of the research carried out in Module I and Module II, or other sources of nutrition research if those modules have not been applied. See Table 1 for sample matrix data, and the Annex of this module for the blank form (Matrix for summarizing the research results, Form III-1.1). For each final recommendation derived in Module II (listed on the Matrix for listing final recommendations, Form II-4.1), the following should be reviewed and discussed:

- Resources required for target population to implement the selected recommendations
- Actual or potential barriers to the adoption of the recommendation by the target population
- Actual or potential facilitators of the adoption of the recommendation by the target population
- Implications of the above findings for the intervention strategies (i.e., how barriers or facilitators may impede or help the target population implement the recommendation) and potential strategies to address them.
- Lessons learned informally during the research process

After studying and analyzing each of the recommendations at the individual or “micro” level, the research team should consider the implications for the interventions at the “macro” level (e.g., the social and institutional environment and communication channels). The following example is taken from a project in Peru. The matrix was completed by an interdisciplinary team and community members using “brainstorming” (a technique in which a list of ideas spontaneously contributed by group members is compiled to address a specific issue).

**Table 1. Sample research summary matrix**

Recommendation	Required resources	Barriers	Facilitators	Potential intervention strategy
For caregivers of children < 24 months old: Offer animal source foods (particularly those rich in iron, such as chicken liver or “blood sausage”) at least once a day, every day, to the child	Time for caregiver to buy, prepare, and serve food Money available to buy iron-rich foods Availability of foods in market	Elevated cost of “blood sausage” Some children do not like chicken liver or “blood sausage” Caregivers think “blood sausage” should not be given to young children Children eat at “community kitchens” (comedores populares) once a day and “blood sausage” or chicken liver is never served there	“Blood sausage” and chicken liver are easy to find in markets caregivers visit Caregivers think “blood sausage” and chicken liver are very nutritious	Promote nutritive value of foods with chicken liver and “blood sausage” and teach caregivers how to prepare them for young children Work with private industry to decrease the cost of chicken liver and “blood sausage” Encourage “community kitchens” to incorporate some food dishes with chicken liver and “blood sausage” into their menu Train personnel working at “community kitchens”

Source: Hilary Creed-Kanashiro, Instituto de Investigación Nutricional, Peru, personal communication.

### Step 2. Identify the recommendations to be promoted

The recommendations selected for promotion in the intervention should be clearly specified and understood by those developing the intervention plan. These final recommendations should be specified in the first column of [Form III-1.1](#).

Examples of recommendations include the following:

- Feed a diverse diet (nutrient-rich foods, thicker gruels, animal source foods, and vitamin A-rich foods)
- Feed responsively
- Wash hands with soap, and practice better hygiene during preparation and feeding of [complementary foods](#)
- Breastfeed exclusively for six months
- Use fortified complementary food or supplements (e.g., multi-micronutrient powders or lipid-based nutrient spreads)

### Step 3. Identify and list all possible intervention strategies

A wide spectrum of potential strategies can be identified to promote the final recommendations. Examples of strategies commonly adopted for this purpose include the following:

- Training (e.g., the provision of educational content for staff working in community programs (Creed-Kanashiro et al., 1998), child care centers, primary health care (Penny et al., 2005, Santos et al., 2001), and health volunteer programs (Bhandari et al., 2004, Guldan et al., 2000). A good example of training materials for community program staff is the *Generic community-based infant and young child feeding counseling package* developed by UNICEF and the University Research Corporation (UNICEF and University Research Group, 2010).
- Development of infant and young child nutrition (IYCN) norms, guidelines, and policies (e.g., guidance for improving quality of various aspects of health services, such as the technical content and type of communication and interaction used in counseling). A good example of this type of material is the Planning guide for national implementation of the Global Strategy for Infant and Young Child Feeding developed by WHO and UNICEF (WHO/UNICEF, 2007).
- Development of a plan for [social and behavior change communication \(SBCC\)](#). This type of plan would be directed to various target groups such as caregivers, grandmothers (Aubel, 2012 Jan), health workers, teachers, or pharmacists, depending on the results of the nutrition status assessment conducted in Module I.
- Promotion of [community participation](#) for problem analysis, planning, implementation, monitoring, and evaluation
- Coordination with strategic allies (e.g., food producers and/or NGOs implementing similar projects). This type of strategy was used in a homestead food production project executed by an NGO in Cambodia, which had a demonstrable impact on the dietary [intake](#) of children (including those under 2 years old) (Olney et al., 2009).

- Provision of supplements (e.g., multiple micronutrient supplements (Allen et al., 2009) or lipid-based nutrient supplements (Chaparro and Dewey, 2010) for pregnant women and children 6.0–23.9 months old). This type of strategy must be coupled with counseling and problem-solving to ensure the appropriate use of the products.
- Provision of counseling (e.g., individual or group counseling to improve exclusive breastfeeding and complementary feeding practices) (Bhutta et al., 2008).

In addition to the above-mentioned strategies, the following options can be considered:

- Advocacy (e.g., the *1000 Day Initiative* was developed to call attention to the importance of the pre-natal period and the first two years of life for child nutrition and health) ([www.thousanddays.org](http://www.thousanddays.org))
- Legislation (e.g., the *International Code of Marketing of Breast-milk Substitutes* was designed to protect breastfeeding by providing guidelines for the marketing of breast-milk substitutes)
- Reorientation of programs (e.g., refocusing food aid programs on prevention rather than treatment of malnutrition (Ruel et al., 2008).

Two or more intervention strategies are often implemented simultaneously. For example, breastfeeding counseling and vitamin A supplementation were offered concurrently in Uganda (Nankabirwa et al., 2011), and fortified complementary food was provided to young children while offering counseling to caregivers to improve feeding practices (Lutter et al., 2008) in Ecuador.

Where feasible, existing programs targeting women and young children should be used as entry points for IYCN intervention strategies.

This type of integration is advantageous because existing programs have infrastructure, community networks, and community acceptability. Therefore, using them as an entry point may avoid duplication of effort and is likely to be more cost-effective than initiating a new program.

The following are examples of entry points for integration with the health system:

- **Maternal and neonatal health programs** such as antenatal care, maternity care, postnatal/newborn care and family planning, which provide opportunities for counseling and supporting women on IYCN (Bhutta, 2008)
- **Facility-based child health programs** such as those offering routine immunization and integrated management of childhood illnesses (IMCI), and child health days, as entry points for interventions to improve IYCN
- **Community-based management of acute malnutrition (CMAM)** (inpatient and outpatient), which is leading the way in many countries in terms of scaling up nutrition activities, represents an important entry point for IYCN activities
- **Community-based health and/or nutrition programs** in many countries that provide important entry points for IYCN counseling, communication, and caregiver support groups
- **Community case management (CCM)**, which is being pursued in many countries to address common childhood illnesses such as malaria, diarrhea, and pneumonia. Optimal breastfeeding practices

are essential to the reduction of diarrhea and pneumonia, so CCM programs have much to gain from appropriate attention to IYCN activities.

- **Prevention of mother-to-child transmission (PMTCT) and pediatric AIDS treatment.** Infant feeding practices are an essential component of PMTCT, so PMTCT programs represent an important entry point for strategies designed to improve IYCN. Several countries (e.g., Zambia and Kenya) have made significant progress in scaling up IYCN activities through PMTCT programs, which have shown significant results in terms of increased exclusive breastfeeding rates.
- **Early childhood development programs,** which provide an excellent opportunity for integrating IYCN interventions. Early interventions, behavior changes, and education and counseling of mothers and other caregivers are crucial for optimal practices in both early child development and IYCN. Parenting education classes can combine early childhood development and IYCN messages for higher impact in both areas. At the community level, workers counseling mothers and other caregivers on nutrition issues can also address issues related to child care and psychosocial development.
- **Water and sanitation programs** are another potential entry point for IYCN activities. For example, an approach known as the Community-Led Total Sanitation initiative uses participatory approaches to generate understanding of the food and water contamination pathways and mobilizes communities to improve hand-washing practices and the use of latrines. These types of programs could also be used to promote safe preparation and feeding of complementary foods.
- **Social protection programs** can serve as an entry point to reach mothers and other caregivers in vulnerable households, increase their access to affordable and high quality foods, and influence their feeding and care practices. Various social-protection interventions, including the provision of micro-credit (Amin et al., 1998 Winter), food supplements, food vouchers, subsidies, and conditional cash transfers (Rivera et al., 2004), can be assessed within the context of each country and integrated with IYCN services for specific target populations.
- **Programs for improved access to local food** are another possible entry point to reach mothers and other caregivers in vulnerable households, and influence their feeding and care practices. Delivery gaps for high-impact nutrition interventions for children under 2 years old may be best filled by cross-sector approaches that integrate IYCN and public health with agriculture programs, including animal husbandry, home gardens, school gardens, and urban agriculture (Olney et al., 2012).

#### **Step 4. Select the intervention strategies**

Based on the information generated in Module I and Module II, and the available financial and human resources, the research team must select the most promising and viable intervention strategies. Additional research may be needed to develop some of the selected strategies. For example, in a project in Guatemala, a decision was made to include school-aged children as one of the audiences of the feeding messages because of their important and active role in the care of younger children (Rivera et al., 1998). As a result, it was necessary to survey school children to determine their potential role as communication channels to their mothers/families on issues related to IYCN. Teachers were also interviewed. Classes were observed to find out which activities children enjoyed the most. It was determined that while school children had tradition-

ally been used by teachers as a conduit for providing information to parents (e.g., about school meetings), they were seldom asked to “teach” parents what they had learned in school. Communication with caregivers and other family members about school subjects was very limited, especially when the family members did not know how to read. A small pilot test was conducted to improve knowledge sharing between schoolchildren and caregivers (especially uneducated mothers). All of the information collected in this research was used to develop the ultimate intervention with schoolchildren.<sup>27</sup>

Most interventions will require behavior change on the part of mothers or other caregivers, family members, health workers, or other individuals. This common requirement should be taken into consideration when selecting the intervention strategies.

### ***Step 5. Design the intervention plan***

For each intervention strategy that will be implemented, a detailed plan that includes all activities should be developed. The examples of strategies listed in Step 3 (training; development of norms, guidelines, and policies; development of a communication plan for social and behavior change; promotion of community participation; coordination with strategic allies; and the provision of counseling) and the activities they entail are described in detail below.

#### ***Training***

The successful implementation of many intervention plans requires the cooperation of groups, organizations, or institutions to support the promotion of the recommended practices, so almost all interventions will include a training component. For example, a communication intervention on child feeding would require training of the intended sources of information on the selected topic (e.g., health volunteers working at the community level, and personnel working in pediatric health, “community kitchens,” and NGOs working on similar projects).

The training element comprises the following activities:

- Identification of the training audience(s)
- Definition of the training objectives
- Development of the educational content
- Definition of the training methodology
- Development of the training materials
- Selection of the trainers
- Development of a timeline
- Estimation of the duration of the training sessions
- Development of an evaluation instrument
- Estimation of the budget

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<sup>27</sup> Elena Hurtado, University Research Corporation, personal communication.

*Identifying the training audience and its characteristics.* Sources of information on IYCN (e.g., key stakeholders, groups, organizations, and health and other ministries) can be identified by completing Module I and Module II. These individuals and entities represent potential trainees for the intervention. For example, if health services are going to be used as a delivery platform for the intervention, health service personnel would be part of the training audience. If midwives are an important health resource in the intervention communities (e.g., if mothers and other caregivers consult them regarding IYCN), they would also be included in the training audience.

*Defining the training objectives.* It is important to clarify exactly what activities the participants are expected to be able to carry out following the training sessions. Use of a matrix is helpful for defining these training objectives. The matrix lists the knowledge, skills, and attitudes required to carry out each desired activity. For example, if the intervention aims to train health volunteers to show community caregivers how to prepare new, thicker-consistency recipes, the required knowledge, skills, and attitudes would be similar to that shown in Table 2. The master form for this exercise is the Matrix for defining the training objectives, Form III-1.2.

**Table 2. Sample matrix for defining training objectives**

Activity	Knowledge	Skills	Attitudes
Show caregivers in the community how to prepare new thicker-consistency recipes	Importance of thick-consistency foods Ingredients and preparation of new recipes	How to correctly and easily prepare the recipes How to teach caregivers to prepare recipes Counsel caregivers about the importance of diets of thicker consistency	Health workers like the recipes Health workers are motivated to promote the use of the recipes

Completing the matrices for each desired activity should define the specific objectives of the training. For example, in Table 2, the training objectives would include health volunteers being able to do the following:

- Counsel caregivers about the importance of diets of thicker consistency for children 6.0–23.9 months old
- Describe new recipes (ingredients and preparation) for thick-consistency foods
- Correctly and easily prepare the recipes to be promoted
- Teach the recipes to caregivers
- Show favorable attitudes toward the recipes and their promotion.

The training objectives must be defined precisely because they will be used as the criteria for evaluating the quality of both the training component and the activities conducted in the intervention.

*Developing the training content.* Once the training objectives are clearly defined, the educational content can be developed, using the elements shown in Table 2 as a guide. While the training content may seem obvious, it must be linked with the existing knowledge and skills of the participants as well as the knowledge and skills they are expected to acquire by the end of the training sessions. The training content must

also address the technical aspects of the recommendations to be promoted in the intervention as well as the communication skills required to transmit the recommendations to the target population. The training content should also incorporate the research results from Module I and Module II —the basis and justification for the intervention.

The training objectives must be defined precisely because they will be used as the criteria for evaluating the quality of both the training component and the activities conducted in the intervention.

*Defining the training methodology.* One common training methodology is known as “training of trainers.” In this methodology, a group of individuals is trained to train others in a cascading fashion. This approach is often used by the Baby Friendly Hospital Initiative (BFHI) (WHO and UNICEF, 2009). Another approach is direct training of the intended conduits of the intervention messages (e.g., service providers such as community health workers who interact directly with the target population).

*Developing the training materials.* Once the training methodology has been defined, the training materials should be developed based on the findings Module I and Module II identifying knowledge gaps and training needs. Existing training materials related to IYCN should be reviewed to determine if they could be translated and adapted to the local context.

**IMPORTANT:** The training materials developed should be pilot tested for 1) ease of use and comprehension by the trainers and the training audience and 2) comprehension by the recipients of the intervention. Training materials may include slides, transparencies, counseling cards, counseling videos, radio spots, flip charts, brochures, etc. Any materials that will be used by the training audiences during the intervention activities should be available at the training sessions. For the example shown in Table 2, the training materials included all food items and utensils required for the demonstration of the recipes to caregivers by the health volunteers. All training audiences should be taught how use the materials correctly and with ease.

*Selecting the trainers.* All trainers should be familiar with the training techniques and topics and, if possible, have participated in the research for Module I and Module II. The number of trainers depends on the number of persons who will be trained and the training methodology that will be used.

*Selecting a timeline.* A training timeline should be developed to depict the time required to plan the training intervention, produce the training materials, evaluate the training outcome, and carry out the training sessions. In developing the timeline, the research team should determine how the training segment will fit in with the rest of the intervention activities.

*Estimating the duration of training sessions.* The duration of each training session should be estimated and included in the timeline.

*Developing an evaluation instrument.* While the topic of monitoring and evaluation is covered in [Module IV](#), some type of evaluation tool (e.g., pre-/post-study tests) should be developed in the research carried out for this module and applied before and after each training session to 1) determine the knowledge and skills of the training audience to ascertain if training objectives were met and 2) collect data (participant comments) about the methodological, administrative, and logistical aspects of the training intervention.

*Estimating the budget.* All intervention plans should include a budget estimating the expenses for each planned activity. For the training intervention, budget line items should include the estimated cost of the material and other resources required to carry out the training sessions, the honoraria for the trainers, and the rental of the site where the training sessions will be held. Per diems and/or travel expenses for trainees may also be included. An illustrative table that can be adapted to outline the estimated budget for different types of training interventions is shown below in Table 3 (see [Matrix for listing budget items for a training intervention, Form III-1.3](#)).

**Table 3. Sample budget line items for a training intervention**

Item	Calculation (in US dollars)	Budget (in US dollars)
<b>Trainers</b>		
Honoraria for 2 trainers	500 x 2 trainers	1 000
Travel expenses for trainers	250 x 2 trainers	500
Hotel for trainers	50/night x 5 nights x 2 trainers	500
Meal per diem for trainers	25/day x 7 days x 2 trainers	350
<b>Trainees</b>		
Travel expenses for 20 trainees	20/trainee x 20 trainees	400
Hotel for trainees	50/night x 5 nights x 20 trainees	5 000
Meal per diem for trainees	25/day x 7 days x 20 trainees	3 500
<b>Training location</b>		
Rental of meeting room	25/day x 5 days	125
Rental of television with DVD	25/day x 5 days	125
<b>Training materials</b>		
Flip charts and markers	50	50
Training DVDs for each trainee	10/DVD x 20 trainees	200
Notebooks and pens	5 x 20 trainees	100
Miscellaneous	100	100
<b>Total</b>		11 950

### ***Developing IYCN norms, guidelines, and policies***

The Ministry of Health (MoH) is the normative agent for health in most countries. Therefore, all health and/or nutrition projects or programs should be coordinated with that institution to ensure the support of health authorities and the credibility of the intervention. The research team should share details of the process and results of the [Assessment \(Module I\)](#) and [Test of Recommendations](#), carried out in Module II, with MoH personnel. It is also advisable to invite a MoH representative to participate in the selection of the recommendations to be promoted in the intervention and the strategies that will be used.

The great variety and sometimes contradictory nature of the recommendations and messages given to communities regarding nutrition and child feeding can be problematic in many countries, leading to confusion on the part of health personnel and/or the target population, resulting in a barrier to behavior change. Therefore, all child-feeding recommendations that will be promoted should be discussed, negotiated, and agreed upon with the MoH. This will lead to increased coordination and standardization of recommendations and messages.

Efforts should be made to involve the MoH in the implementation process, especially in the dissemination of the messages and the use of educational materials in health clinics. This usually involves training of MoH personnel in not only the technical aspects of the intervention recommendations but also the revision of their own protocols and procedures to improve the quality of counseling related to IYCN.

The sustainability of intervention strategies is greatly improved by attaining government buy-in, involvement, and—ideally—leadership. It also helps to ensure strengthening of the capacity of local government, health workers, NGOs, professional organizations and other groups, and adequate monitoring and supervision during implementation.

The development of health services norms involves coordination with various entities at both the central and local level.

*Central-level coordination.* At the central level, there should be coordination between the research team and the following entities:

- The MoH, regarding the norms and/or the recommendations promoted in the intervention, the messages used to encourage their adoption by the target population, and the design of the implementation plan
- Various programs within the MoH (e.g., food and nutrition security programs, or a Baby Friendly Hospital programs)
- Other ministries (particularly Agriculture, Economics, and Education), especially for broader interventions such as food and nutrition security

*Local-level coordination.* Coordination at the local level should include the following:

- Dissemination of the information collected in Module I and Module II to local health services personnel
- Dissemination of the message that infant nutrition is a central component of good health in all well- and sick-baby services offered by health centers and other venues involved in IYCN activities
- Selection and standardization of key health messages (with concurrence from the MoH) on recommended practices that institutional health personnel will know and disseminate
- Integration of MoH personnel trained in pediatrics, growth, and development in relevant program activities
- Inclusion of community extension personnel (e.g., volunteers, health promoters and midwives, managers of “community kitchens,” and pharmacy personnel) in IYCN interventions, with support from MoH personnel.

- Implementation of appropriate counseling techniques and good communication skills (e.g., listening to the caregiver, congratulating her, and asking “checking questions”<sup>28</sup> to verify her comprehension)
- Development and use of educational materials that facilitate counseling to encourage behavior change
- Distribution of materials to mothers/other caregivers of small children, other family members, and other individuals who influence IYCN
- Use of preparation of recipes in participatory demonstrations for caregivers of small children at both the individual and group level

### ***Developing a communication plan for social and behavior change***

Health communication strategies known as social and behavior change communication (SBCC) plans are the central axis in all interventions involving changes in behavior and adoption of recommendations. SBCC plans usually integrate various intervention strategies that require a communications component.

It may be necessary to hire an outside expert with experience in social marketing and communications to help with some specific components of the intervention plan. This will depend on the expertise and experience of the research team and the available resources.

To develop a SBCC plan, the research team will need to carry out the following activities:

- Identification of primary, secondary, and tertiary audience (defined in Module I and Module II)
- Review of recommended practices (derived in Module I and Module II)
- Definition of communication objectives
- Identification of the communications channels
- Development of creative messages and strategies
- Division into different phases
- Market analysis
- Development, testing, and production of the materials
- Development of an implementation plan
- Estimation of the budget

Each activity is described below.

*Definition of primary, secondary, and tertiary audiences.* Although the child is the main beneficiary of the recommended practice, it is the mothers or other caregivers (or other family members or individuals such as a teachers or traditional birth attendants) who must implement the behavior changes by following the recommendations that emerged from the research conducted in Module II. This primary audience must be specifically defined, along with the secondary and tertiary audiences (described in Module I and Module II). The primary audience can be any target population (e.g., health providers) but is most often caregivers.

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<sup>28</sup> Questions designed to determine what a person has learned so that further information or clarification.

Secondary audiences are persons that influence the primary audience such as fathers and grandmothers. Tertiary audiences are decision-makers, sponsors, strategic allies, and other influential persons who contribute to a program or intervention success through advocacy efforts or by providing funding and/or an enabling environment.

In addition, it is necessary to define, within the primary audience, the different segments or groups influenced by the intervention (audience segmentation). Different audience segments have different concerns, interests, and practices and thus require the use of different strategies and communication messages. The various segments of the primary audience should be described and quantified to guide the design of the communications materials and determine how many different materials need to be produced.

Examples of various audience segments within a primary audience that consists of caregivers of infants and young children are provided below:

- Pregnant women
- First-time mothers
- Adolescent mothers
- Caregivers of children 0–5.9 months old
- Caregivers of children 6.0–8.9 months old
- Caregivers of children 9.0–11.9 months old
- Caregivers of children 12.0–23.9 months old
- Caregivers who consume meals from “community kitchens”
- Caregivers who work outside the home

Other audience segments may be defined according to geography (e.g., region of the country); type of residence (urban, rural, or remote); demographics (e.g., ethnic-linguistic group); or education or socioeconomic level.

Review of recommended practices. The selected recommendations derived from the results of Module I and Module II (listed on Matrix for listing final recommendations, Form II-4.1 in Annex II-4); the steps and resources required for their adoption by the primary audience; and any facilitating factors and perceived positive consequences should be described in the intervention plan (see Matrix for analyzing impact, feasibility and observability of recommended practices, Form I-10.4 in Annex I-10, and Matrix for analyzing compliance and feasibility of tested recommendations, Form II-2.6 in Annex II-2). The recommended practices should be specified by audience segment. This information should be derived from the analysis conducted in Module I and Module II and summarized in the Matrix for summarizing research results, Form III-1.1).

*Definition of communications objectives.* The communications objectives of an intervention usually refer to and define the following:

- The coverage or exposure of the different audiences to the intervention activities and materials
- The increase in the knowledge of the different audience segments about the main messages of the intervention
- The adoption and sustainability of the recommended practice(s)

The evaluation of the communication intervention is based on the coverage of and change of knowledge and behaviors among the primary audience. Generally, the communications objectives do not include changes in the nutritional status of children under 24 months old, which are assessed through anthropometry or biochemical measures. However, changes in nutritional status may be included in the criteria for evaluating the project as a whole (see Module IV).

*Identification of communication channels.* The decisions made in the previous steps and the information collected in Module I (particularly in the Caregiver Survey) will guide the research team in the selection of the communication channels best suited for reaching the primary audience, as well as the secondary and tertiary audiences (if applicable). Interpersonal contact (enhanced by the use of other communications channels) is usually the preferred/most effective communication channel for behavior change. The selection of communication channels should be based on the communication objectives, the reach of each channel, and cost. The communications plan should consider the following types of communications channels:

- Mass media (e.g., radio, television, and newspapers)
- Interpersonal communication (e.g., contacts with health personnel, community volunteers, and individuals who practice the recommended behaviors)
- Graphic materials (e.g., posters, flyers, and billboards)
- Audiovisual materials (e.g., video)
- Community theater, puppet shows, dance, song, and storytelling

*Development of creative messages.* The creative messages should be designed to promote the recommended practices and achieve the communications objectives. These messages contain information about the recommended practices and target specific audience segments via the use of words and phrases common to each one, documented in Module I and Module II. For example, a message designed to result in “a greater percentage of caregivers using responsive feeding measures” might be “Feed the child with patience, love, and good humor” (Penny et al., 2005).

The messages should convey the main benefit that the primary, secondary, and tertiary audiences will obtain from carrying out the recommended practices. For example, if the objective is that “a greater percentage of children 12.0–23.9 months old eat healthy snacks,” and the research findings indicate caregivers consider a healthy child to be a child who grows well and is happy, a potential message targeting the caregivers might be “Giving fruit for snacks will help the child grow and be happy.”

*Division into different phases.* SBCC interventions are usually divided into different communication phases, as not all messages can be disseminated simultaneously. The research team should decide which objectives are most important and which are complementary and arrange the messages in phases accordingly. For example, a communication intervention in Guatemala was divided into three 4-month phases (Rivera et al., 1998). In Phase 1, the basic messages about increasing the feeding frequency of children were introduced. Phase 2 introduced messages for special cases (e.g., when the child is sick or convalescent) and messages directed to fathers. Phase 3 was used to reinforce the previous messages.

*Market analysis.* Development of an SBCC plan should include a market analysis (a technique used in commercial sectors to characterize and evaluate a product in relation to its competitors). In health and nutrition interventions, the “product” is often a series of recommended practices. Through market analysis, the “four Ps” of a product are analyzed: price; promise (or main benefit); positioning (the status of the product in the minds of the audience); and promotion.

*Development, testing, and production of materials.* The research team should determine which materials could be best adapted for the primary, secondary, and tertiary audiences; the most appropriate communications channels; and the specific messages. Based on the data generated in applying Module I, the team will have some idea about materials used by other organizations and how they could be adapted for the intervention. New materials will probably need to be developed.

Possible materials include brief radio messages and other audio messages; posters for display at health centers and similar venues; flip charts for group meetings; decision trees and interactive materials for individual counseling; pamphlets describing the main IYCN recommendations, by child age group; and recipes for distribution during the demonstration of preparation of recipes. Instructions on how to use each material correctly (“user guides”) should be prepared for the training sessions.

All materials and messages should be tested before being reproduced in their final form. The testing component is crucial to ensure adequate effectiveness of the materials and messages and should be carried out with a sample of the intended audience to gauge comprehension and cultural appropriateness. Testing should include alternative materials and a follow-up test should be carried out after any modifications have been made. The research team should develop simple tools for testing each material.

The quantity materials produced should be based on the estimated number of people in the primary, secondary, and tertiary audiences, and these numbers should be specified in the communication plan, along with the logistics of distribution.

*Development of an implementation plan.* In developing the implementation plan for an SBCC intervention, the research team should consider 1) how the intervention will be implemented within the context of existing nutrition and feeding programs of the MoH and other organizations; 2) how the messages and materials will be distributed to the selected communications channels; and 3) what training will be required for the personnel involved (see Training in Step 5). The implementation plan should also include a list of all communication activities and when they will be carried out (using a timeline or some other illustrative device).

*Estimation of budget.* Communication interventions can be expensive, especially those involving television or radio. A detailed budget for the development and delivery of the communication plan is therefore essential.

### **Promoting community participation**

Community participation is important because it 1) provides a means for community members to participate individually or collectively in the planning and implementation of health and nutrition programs that will affect them and 2) reinforces the population's awareness of its capacity to modify and intervene in factors that influence the health and nutrition of its children.

There are many ways to involve a community in an intervention. In Peru, researchers found that adding a “blood sausage” dish to “community kitchen” menus once a week led to community participation in reinforcing the research team's recommendation to give “blood sausage” to young children (Creed-Kanashiro et al., 1998).

In some cases, achieving community participation in an intervention will not be necessary. For example, the development of MoH norms or protocols is essentially a negotiation among MoH authorities and health professionals and thus does not require or allow for the participation of other community members.

Suggested methods for promoting community participation include the following:

*Community assemblies.* Community assemblies have proven to be the most common and effective means of achieving community participation in a specific intervention activity or event. They have also been used as a forum for identifying the needs of the community and proposing solutions; disseminating the research results; and selecting community health workers to be trained for an intervention.

*Community mobilization.* Community mobilization is a process in which specific actions are planned, carried out, and evaluated by community individuals, groups, and organizations on a sustained basis. This method is often used to improve health, hygiene, and education levels to enhance the overall standard of living in the community.

While community assemblies and community mobilization are useful for carrying out a specific activity (e.g., building a center for health- and nutrition-related activities), the formation of community groups with similar interests (e.g., mothers' clubs, breastfeeding and child feeding support groups, and community banks to improve mothers' income) can help support long-term goals. For example, Zimbabwe's Community Food and Nutrition Programme integrated a cultural tradition in which a plot of land is farmed by the community and the resultant crops are stored and as a source of food for vulnerable households or by the community as a whole during food shortages.

*Community representatives.* Some projects have invited community representatives to participate in research and planning. Community representatives can help gather background, exploratory, or confirmatory information; facilitate the research team's entry into the community; and recruit program participants or volunteers. For example, Mexico's Health, Education and Nutrition Program (Progesa) appointed a community promoter whose primary responsibility was to promote the program, motivate families to participate, and ensure compliance by acting as a local representative of the program.

Each project should define the expected degree of community participation, the ways in which community members can participate, and the aspects of the intervention in which community participation is particularly important.

Most community participation methodologies entail the following steps:

- Organization of the community
  - Identification of the problem
  - Identification and enlistment of leaders/health committees=
- Assessment/analysis of the problems
  - Self- or participatory assessment
  - Analysis of the problems identified
- Plan of action
  - Vision of the future
  - Selection of feasible solutions
  - Development of an action plan (dates, activities, responsible parties)
- Implementation and monitoring
  - Implementation of the activities described in the action plan
  - Participatory monitoring and evaluation.

The methodology that will be used to enlist community participation should be described in a detailed plan.

### ***Coordinating with strategic allies***

In some cases, coordination with certain groups or organizations can help alleviate barriers to the adoption of the promoted recommendations that are beyond the scope of the intervention (e.g., lack of access to iron and vitamin A-rich foods). These groups or organizations would be considered “strategic allies” because although they may not promote the recommended practices they help improve the chances of their adoption and thus contribute to the sustainability of the intervention.

Coordinating with strategic allies can include the following activities:

- Identifying groups/organizations that could help diminish or eliminate barriers to adoption of the intervention recommendations (e.g., industry players, NGOs, “community kitchens,” farmers, etc.)
- Establishing contact with the groups/organizations
- Preparing advocacy documents with a detailed explanation of the identified barrier/problem and what is being requested of the strategic ally
- Scheduling a meeting to present and discuss the proposal

### ***Counseling for behavior change***

Individual and group counseling is a central component of interventions for behavior change. Key characteristics of counseling for behavior change include the following (WHO, 2008):

- No more than two or three recommendations are given per session
- The counselor recognizes what the person is doing well

- Concerns of the person are addressed
- Only a limited number of key messages is used to motivate the person to follow the recommended practice(s)

Below are steps to follow when planning counseling for behavior change.

*Selection and evaluation of practices that require improvement.* An IYCN communication strategy and plan should focus on a small selection (no more than two or three) of feasible recommended practices with the greatest potential public health impact (see Step 4 in Module 1, *Data integration and analysis, and recommendation formulation and prioritization*, and Form II-4.1, Matrix for listing final recommendations, in Module II-4). The strategy should not attempt to address too many practices simultaneously as this can diminish the potential impact.

*Establishment of rapport.* Establishing rapport is initiated with greetings and by engaging a person in a respectful, relaxed conversation on a common topic of interest. Praising the person for what she is doing well fosters a friendly environment and inspires confidence and trust by showing that the counselor understands and respects local customs, traditions, and norms, and speaks the local language. Judgmental tones should be avoided.

*Response to concerns of counseling recipient.* The person being counseled should be asked if she has any questions about the recommendation(s) or concerns about implementation. Questions should be answered, concerns listened to carefully, and checking questions posed as needed. Empathy should be shown to indicate understanding of the person's feelings, followed by discussion of what is feasible to change and who could provide help and support. Some of these ideas may emerge from the Test of Recommendations completed in Module II. Difficulties in the person's situation should be acknowledged and she should be encouraged to take action. Assistance should be given to help the person plan how to overcome any obstacles to following the recommendation.

*Selection of recommendations and motivational messages.* Counselors should select key messages to motivate the counseling recipient to comply with selected recommended practice(s). During the counseling session, it is important to agree on concrete actions that are feasible for the person. If too many different actions are suggested the counseling recipient may forget many of them or become discouraged. The most important and feasible actions (two or three) should be suggested, and the caregiver should be encouraged to bring the child back for follow-up. The follow-up counseling session will give the caregiver a chance to report success or failure, and the health provider a chance to give additional advice as needed.

*Use of interactive materials.* Interactive materials should be used to help the counseling recipient remember the recommendation. During counseling, questions and discussion should be encouraged so that the session is interactive and the counseling recipient can contribute ideas. Interaction can be encouraged by posing checking questions. Use of materials such as counseling cards and brochures can help guide and stimulate two-way discussions.

When counseling on feeding, time should be taken to explain each recommendation clearly and simply.

Nutritious local foods should be suggested and instructions on how to prepare them provided. It may be helpful to show pictures or posters of local foods. In some health facilities, demonstrations are given on how to prepare nutritious foods for young children. The caregiver should be encouraged to attend a cooking demonstration if available.

*Use of checking questions.* After explaining the recommendations, the counselor should ask checking questions to ensure the person has understood the information given. As explained above, checking questions are designed to determine any gaps in trainees' grasp of training content so that more information can be provided and/or instructions further clarified as needed. Checking questions should be phrased so that the answer requires more than simply "Yes" or "No" (i.e., they should require a certain amount of explanation). For example, the caregiver could be asked: "What food will you provide that comes from an animal?"

Asking checking questions requires patience. They may know the answer but be slow to respond for various reasons (e.g., shyness, surprise at the fact that a substantive response is expected, or fear of answering incorrectly). Counselors should provide encouragement and wait patiently for an answer.

Sometimes the respondent may answer a checking question vaguely or incompletely. This will require a second checking question to determine if the initial question was understood. If the respondent answers the question incorrectly, or cannot remember what she is being asked about, the counselor should avoid making her feel uncomfortable. The counselor should try to clarify the question or provide more information and then ask another checking question.

In completing Module III, the research team will have designed a detailed intervention plan and can proceed with Module IV to develop a monitoring and evaluation plan.

## Matrix for summarizing the research results (Form III-1.1)

Recommendation	Required resources	Barriers	Facilitators	Potential intervention strategy

**Matrix for defining the training objectives (Form III-1.2)**

Activity	Knowledge	Skills	Attitudes

**Matrix for listing the budget items for the training plan (Form III-1.3)**

Item	Calculation	Budget
<b>Trainers</b>		
<b>Trainees</b>		
<b>Location</b>		
<b>Materials</b>		

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# Designing a monitoring and evaluation system

## Purpose

Modules I, II and III outlined the main problems encountered in infant and young child feeding (IYCF) practices and various strategies and activities that can be carried out to resolve them. This module addresses the important issue of monitoring and evaluation. During the implementation stage, how does the research team know if the intervention is being implemented as it was designed? And if it is determined that the goals of the intervention are not being met, how does the research team know which improvements to make? Finally, how does the research team know if the intervention improved IYCF practices? A well designed monitoring and evaluation system can provide answers to these questions. Monitoring an intervention provides information *during* the implementation that can be used to 1) determine any adjustments that should be made, and 2) explain how various factors may have led to success, partial success, or failure. The evaluation stage provides information about the intervention's impact. This module provides general guidelines<sup>29</sup> for constructing a monitoring and evaluation system for interventions designed to improve IYCF practices.

Health and development program interventions fail in three different ways:

1. The program was poorly designed (e.g., the intervention strategies and recommendations were poorly chosen)
2. The program was poorly implemented (e.g., the design was adequate but the personnel were not properly trained and could not implement the intervention strategies, or the program coverage was very low, reaching only a few of the intended beneficiaries)
3. Although well designed and implemented, the program did not have the effects on practices that were anticipated (e.g., despite lengthy and effective training, the intervention participants were unable to influence the behavior of the target population).

Program failures resulting from deficits in one or more of these three areas can take many forms. For example, an educational program designed to promote the consumption of carrots by children might not have the expected impact on vitamin A status for the following reasons:

- Those intended to deliver the intervention did not do so or used methods to promote behavioral change that were not the most appropriate
- Caregivers learned about the importance of giving carrots but were not able to purchase them during certain months of the year

<sup>29</sup> Additional sources may need to be consulted, depending on the scope of the plan and the experience of those implementing it. See also KUSEK, J. Z. & RIST, R. C. (2004) Ten steps to a results-based monitoring and evaluation system: a handbook for development practitioners. Washington DC, The World Bank.

- Even though children were given carrots more frequently than before the program started, the amounts given were still insufficient to increase vitamin A status to adequate levels

Lessons learned during the evaluation stage can improve future programming by identifying aspects of the intervention that proved effective as well as those that were not successful and thus need to be improved or eliminated. Evaluations can also contribute to the sustainability of the program by helping to determine how to best ensure delivery of the intervention by permanent institutions, both regional and local, taking account of contextual factors. Therefore, the best way to ensure that a program is being properly implemented and has the intended effects is through adequate attention to monitoring and evaluation. The information in this module should help program designers create an integrated monitoring and evaluation system that will help them carry out the following tasks:

- Assess progress in implementing the intervention plan developed in Module III (monitoring component)
- Determine if any modifications should be made to the intervention design (monitoring component)
- Evaluate the impacts of the intervention plan developed in Module III (evaluation component)
- Ascertain that those impacts can be attributed to the program (evaluation component).

## Product

Upon conclusion of this module, the research team will have a monitoring and evaluation system that describes how the intervention designed in Module III will be periodically assessed to determine if it is proceeding according to the implementation plan and evaluated to determine if it has had the expected outcomes on infant and young child nutrition. Therefore, the monitoring and evaluation system must be developed before implementation of the intervention.

## Steps

The conceptual framework for this module stems from a World Bank publication on monitoring and evaluating nutrition programs (Levinson et al., 2000). According to this publication, creating a monitoring and evaluation plan requires three main steps:

1. Specification of program goals
2. Identification of program inputs, outputs, outcomes, impacts, and benefits
3. Design of a monitoring and evaluation system.

### **Step 1. Specify program goals**

Module III provided guidance on developing a series of intervention strategies and activities. In the first step of this module, the strategies are revisited to articulate the overarching program goals. Levinson et al. (Levinson et al., 2000) offer the following definition of program goals: “Goals are the broad aims of the program, the significant, longer-term changes that planners expect to occur in people’s lives, for example,

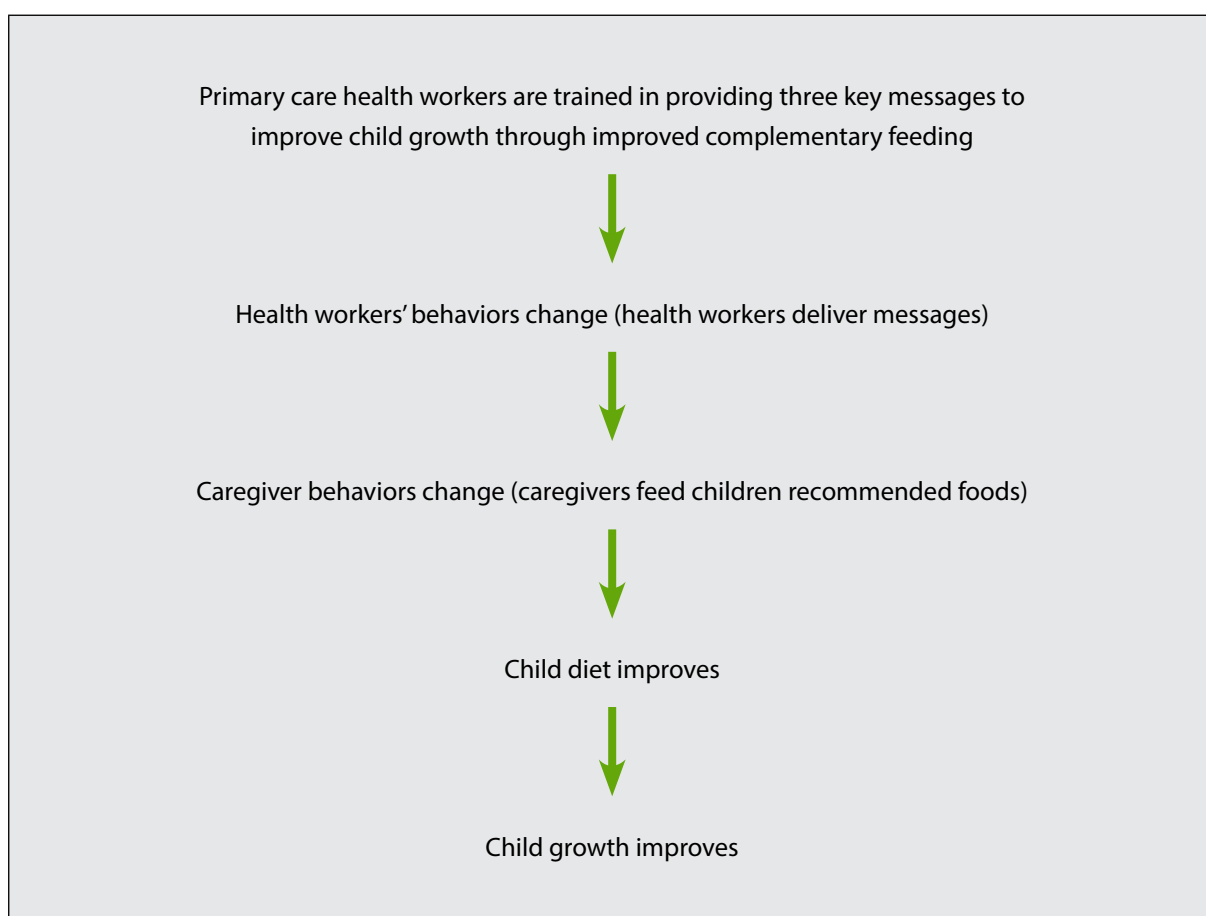
the reduction of severe protein-energy malnutrition and the significant reduction of iodine deficiency disorders.”

In other words, goals are focused on improvements in the nutritional status of young children. As such, an intervention focused on young child feeding might have goals like improving dietary diversity or reducing iron deficiency.

### **Step 2. Identify program inputs, outputs, outcomes, impacts, and benefits**

Before designing the monitoring and evaluation system, the program impact pathway (PIP) should be clearly stated and graphically depicted (Habicht and Pelto, 2012, Olney et al., 2009). The PIP specifies the series of steps that need to be implemented to achieve program goals. Figure 1 shows an example of a PIP.

**Figure 1. Sample program impact pathway (PIP)**



Levinson et al. (Levinson et al., 2000) describe a five-component conceptual framework that clarifies how program activities result in specified program goals. The five components, which can be expressed quantitatively, are defined as follows:

- *Inputs* are the materials, goods, and services needed to implement the program. Inputs include such items as hiring and training of program personnel, educational materials, food, supplements, and equipment to measure children's weight and height, and growth charts.
- *Outputs* refer to the successful delivery of the program's materials, goods and services to the target population, with emphasis on their coverage, quality, and utilization. For example, in a communication program, an output would be the number of caregivers who received education on incorporating iron-rich food into their children's diet. Other outputs include the number of program personnel trained on a particular topic, amount and quality of educational materials delivered to the intended population, food provided to target families, supplements given to children, equipment delivered to health personnel or facilities, and growth charts given to children's families. Program implementation is monitored through measurements of inputs and outputs that are used to evaluate the program implementation process. For example, high-quality monitoring can determine if counseling is conducted accurately and clearly, and if growth monitoring is conducted correctly.
- *Outcomes* are those effects the program outputs can have and which are necessary for the program to have the intended impact. Change in awareness of the nutrition problem, knowledge of feeding recommendations, and changes in feeding behavior are examples of outcomes. However, the fact that the program results in certain outcomes does not necessarily guarantee that it will have an impact on children's nutritional status.
- *Impacts* are the biological and observable changes in the nutritional status of the child. Anthropometric (e.g., growth) and biochemical indicators are commonly used measures of the impact of a nutrition program. Impacts could include reduction in the prevalence of anemia, prevalence of stunting or incidence of low birth weight.
- *Benefits* are the ultimate effects that the program hopes to have, but are unlikely to be measurable within the context of an ongoing program. Benefits of a successful nutrition program may include such effects as increased cognitive ability, decreased morbidity, increased work productivity, increased life expectancy, and decreased mortality. Benefits may not be measured but assumed based on current scientific knowledge.

A blank form for identifying the components can be found in the Annex ([Matrix for identifying components of the monitoring and evaluation conceptual framework, Form IV-1.1](#)) and an example of the matrix is shown in Table 1.

**Table 1. Monitoring and evaluation framework showing how program activities result in achievement of program goals**

Goals: broad aims of program				
Inputs →	Outputs →	Outcomes →	Impacts →	Benefits
Resources used to support primary program activities	Delivery of goods and services	Changes in behaviors or practices	Nutritional status measures	Broader effects
Monitoring		Evaluation		

Source: (Levinson et al., 2000).

Through monitoring, the quantity and quality of inputs and outputs are documented. Through evaluation, outcomes and impacts are ascertained and their relationship to inputs and outputs examined to assess the extent to which impacts can be attributed to program implementation. In summary, assessment of inputs and outputs is the core of monitoring program implementation, whereas assessment and analysis of outcomes and impacts and their attribution to program implementation is the focus of program evaluation.

Too often, impact evaluations are conducted without assessing program implementation (e.g., inputs and outputs). This can lead to an evaluation that shows no impact, but no knowledge of why the program was not successful. Monitoring of program implementation can be used not only to explain why or why not a program showed impact, but also to make program adjustments to improve the likelihood of a positive impact evaluation. In general, a program impact evaluation should not be considered before evidence is available from monitoring of inputs and outputs to show that the program is properly implemented (Mason et al., 1984).

The decision to measure both impacts and benefits will depend on the specific questions that need to be answered as well as the evaluation budget available. For some programs, it may not be feasible or advisable to measure impacts and benefits. For example, children's weight and length are affected by a wide range of factors in addition to diet and feeding practices. When resources are available, weight and length should be included in program evaluations (Cogill, 2003), however, even well run programs that positively affect diet or feeding practices may not demonstrate significant changes in length. In Cambodia, the impact of a homestead food production program on household production and consumption of micronutrient rich foods, and consequently on maternal and child health and nutrition was evaluated. The evaluation used two cross-sectional surveys (baseline and end-line) in samples of intervention and comparison group (control group) households (Talukder et al., 2000). Using end data and multivariate analysis, the pathways of impact of the program on maternal and child health and nutrition were explored. Although greater household production of fruits and vegetables was associated with greater household dietary diversity and this, in turn, with dietary diversity among mothers and children, pathway analyses showed that household-level benefits from the program did not translate into significant improvements in maternal and child health and nutrition.

As mentioned, benefits are longer-term effects that require a long follow-up period and substantial resources to evaluate properly. For these reasons, benefits are rarely evaluated in programs. Thus, most programs evaluate their effect on outcomes (i.e., the specific behaviors being promoted). Often, impacts are also evaluated, and if positive, benefits are assumed based on previous research.

The analysis of outcomes may be more effective in understanding why programs succeed or fail if they include qualitative methods such as unstructured interviews and focus groups since they can afford an in-depth understanding of the reasons behind their failure or success. Pathways through which the program's desired impact is achieved are permeated by cultural idiosyncrasies. These may not have not been captured by the qualitative methods employed in Module I and therefore their role as barriers to the adoption of certain behaviors were not foreseen, or Module I may not have been implemented. The recognition that numerous programs have failed because, at least in part, they were based on a model that didn't incorporate the perceptions and beliefs held by the target audience has led to a more frequent use of qualitative methods in the evaluation of interventions (Lindsay, 2002).

An example of these monitoring and evaluation components to reduce anemia among Peruvian women and children is presented in Table 2. Cooks from "community kitchens" (*comedores populares*) were trained and supplies were made adequate (inputs) to increase the use of chicken livers in recipes (outputs) (Creed-Kanashiro et al., 1998). It was expected (and later shown through monitoring and impact evaluation) that with the increased availability of chicken liver in the recipes (outputs), women and children attending the "community kitchens" would consume more chicken livers in their diet (outcomes). The additional iron in their diet, from the iron-rich chicken liver source, would increase their circulating blood iron, or hemoglobin, and decrease anemia among women and children (impact). Based on other studies, with adequate iron status, children would be expected to have improved learning capacity and women would have increased work capacity (benefits) (Lozoff and Georgieff, 2006, Mann et al., 2002). This shows how an analysis of outputs and outcomes can help clarify the pathways through which any expected impacts may be achieved (Robert et al., 2007).

**Table 2. Sample monitoring and evaluation conceptual framework**

Goal: Reduction of anemia among women and children				
Inputs →	Outputs →	Outcomes →	Impacts →	Benefits
Training of "community kitchen" cooks Adequate supplies of chicken livers	Chicken livers provided three times weekly in recipes prepared for women and children attending "community kitchens"	Increased consumption of chicken liver at "community kitchens" by women and children	Reduced prevalence of iron-deficiency anemia among women and children	Improved learning and work capacity
Monitoring		Evaluation		

Source: Research carried out in Peru (Creed-Kanashiro et al., 1998).

In Module III, various intervention strategies were discussed. As shown in Table 3, different intervention strategies can have a variety of inputs, outputs, and outcomes.

**Table 3. Various types of intervention strategies and their potential inputs, outputs, and outcomes**

Intervention strategy	Inputs	Outputs	Outcomes
Training: teaching health volunteers how to demonstrate recipes	Health volunteers trained to demonstrate iron-rich recipes to caregivers	Targeted caregivers receive recipe demonstration	Targeted caregivers make iron-rich recipes Targeted children consume iron-rich meals Targeted children increase their iron intake
Norm modification: changing hospital norms so that all newborns are put immediately to the breast	Meetings arranged with hospital staff in charge of maternity ward norms	Meetings held with staff in targeted hospitals	Targeted hospitals change protocols so that all newborns are put immediately to the breast Targeted hospitals implement new protocols
Communication: facilitating pharmacist recommendations that caregivers offer more liquids and foods to children during illness	Development and production of relevant behavior change communication materials for pharmacists	Targeted pharmacists receive materials	Targeted pharmacists promote recommendation Targeted caregivers understand recommendation Targeted children given more foods and liquids during illness
Community participation: organizing breastfeeding support groups	Meeting space identified for support groups	Meeting space provided for breastfeeding support groups	Group meetings held with mothers of infants
Coordination: collaborating with strategic allies	Agreement with poultry processing plants to provide chicken livers at cost	Chicken livers are provided at cost	Targeted children increase their consumption of chicken livers
Advocacy: encouraging pediatricians' associations to promote the introduction of complementary foods to infants at 6 months of age	Meetings arranged with cognizant officers in pediatrician associations	Meetings held with officers in targeted associations	Targeted associations introduce bylaws to promote the introduction of complementary foods at 6 months of age
Legislation: developing legal frameworks to help fund growth monitoring equipment and activities in rural areas	Development of draft legislation	Draft legislation presented to legislators representing rural constituents	Rural children increase attendance at growth monitoring and promotion activities
Production: enlisting food companies to develop and manufacture fortified foods	Agreement with food company to develop a fortified complementary food	Fortified complementary food produced and distributed	Targeted children increase their consumption of fortified complementary food

**Step 3. Design a monitoring and evaluation system****Developing indicators**

Monitoring and evaluation information that is collected is most helpful to the program manager and implementing team when it is carefully crafted to measure what is intended. This is achieved through the development of indicators. An indicator is an objectively verifiable measurement that reflects the activity, assumption, or effect being measured (Levinson et al., 2000). Indicators used for monitoring are usually different than the ones used to measure impact and depend on the objectives of the intervention being evaluated. For example, in an intervention to evaluate the effect of promoting eggs to improve children's diet with the goal of improving growth, a monitoring indicator might be the proportion of mothers who fed egg to their child the previous day. An indicator for impact might be gain in child weight and length.

Levinson et al. (Levinson et al., 2000) consider the following descriptors as characteristics of good indicators: simple, clearly defined, measurable, variable, valid, reliable, and quantifiable. They emphasize that useful indicators “must show variation between persons and over time” or else they “will not discriminate between those who have benefited from the program and those who have not.” For example, child height varies over time and between well and poorly nourished children, whereas adult height does not, making height a good impact indicator for children’s (but not adults’) nutritional status.

### ***Planning how to monitor program activities***

*Deciding on personnel to conduct monitoring activities.* Levinson et al. (Levinson et al., 2000) recommend considering what role program personnel can play in monitoring and evaluation. Is the required information so specialized or time consuming to gather that program personnel will be over-burdened? Should an external institution be invited to gather all or some of the monitoring and evaluation data? Using both internal and external personnel is most likely best, depending on the size and scope of the program. External personnel are likely to be more objective in their assessment and may have some specialized knowledge (e.g., in statistics), which can be useful for a more rigorous evaluation. Internal, program personnel, on the other hand, will certainly be more familiar with the history and setting of the program and will be able to provide important contextual insights. Use of internal program personnel also allows for some capacity building for the future.

*Selecting information to be collected* The team must carefully consider which information is required for decision-making and how often it needs to be updated. Factors to assess are as follows:

- What information will be most useful for monitoring the program? For example, will knowing the religious affiliation of the families of children who attend growth-monitoring sessions help the research team improve the program as much as knowing the children’s age?
- What information is already being routinely collected? For example, if a program is implemented within an existing larger program or at a health facility, it is likely that information on growth monitoring, clinic attendance, or supplement distribution is already being collected.
- What information can be collected on an ongoing basis by program staff? For example, if someone spends 15 out of 20 working days a month recruiting, training, and supervising health volunteers, can this person reasonably be expected to select clinic records for a sample of 50 children per month and monitor selected criteria?

Although outcomes fall within the evaluation section of the conceptual framework presented in Table 1, outcome data should be collected regularly during program implementation and not just at the evaluation stage. The mechanism for gathering this information on an ongoing basis is part of the monitoring system and can be gathered through small surveys.

Matrix for determining what monitoring data should be collected and how often, Form IV-1.2) is provided to aid with assessing these three factors, and an example of the matrix is shown in Table 4.

**Table 4. Matrix for determining what monitoring data should be collected and how often**

Information	Frequency	1. Useful?	2. Already being collected?	3. Feasible to collect?
Input				
Output				
Outcome				

The input, output, and outcome data to be gathered, and the frequency of data collection, are noted in the first two columns. Three questions are then evaluated one by one: 1) Is the information useful? 2) Is it already being collected? and 3) If not, is it feasible to collect it? After completing this process, the research team will decide on the amount and type of information to gather for program monitoring. See Table 5 for an example of a completed matrix for determining type of monitoring data (and frequency of collection) for a training input.

**Table 5. Sample matrix for determining what monitoring data should be collected and how often for a training intervention input**

Information	Frequency	1. Useful?	2. Already being collected?	3. Feasible to collect?
Input: training community cooks				
Number of trainings sessions held	1 per month	Yes	Yes	Yes
Number of trainees who attended	1 per month	Yes	Yes	Yes
Number of trainees who passed a post-training test assessing minimum skills and knowledge	1 per training	Yes	No	Yes
Age of trainees	1 per training	No	No	Yes
Sex of trainees	1 per training	No	No	Yes
Education level of trainees	1 per training	No	No	Yes
Ethnicity of trainees	1 per training	No	No	Yes

Although it is feasible to collect all of the input information, the research team decides that the first three types of information will yield the most useful data. Forms will have to be developed to assess “Number of trainees who passed a post-test assessing minimum skills and knowledge.” In many cases, program personnel can collect output (if not tabulate it) as part of their routine activities. Collection of outcome information for evaluating impact usually requires a separate plan and additional human resources.

*Monitoring forms.* Forms need to be developed for listing the monitoring data that will be collected, the field personnel who will be responsible for collecting it, and the frequency of the data collection. Matrix for listing monitoring and evaluation activities (Form IV-1.3) can be used to plan data collection. An example of a completed matrix is shown in Table 6.

As shown in Table 6, some of the indicators are assessed with a single number (e.g., the output indicator) and others with a ratio of two numbers (e.g., the input, outcome, and impact indicators). The “form” column indicates the name of a form that needs to be developed to gather information on that specific

indicator. The “person” column refers to the technical background of the person or group of persons who will be responsible for filling out the form. Finally, the frequency with which monitoring information is going to be collected and reviewed, and the timing of its collection for evaluation purposes, are noted in the “frequency” column. In the case of the input indicator, even though information will be collected at each training session (see Table 5), and several training workshops are held each month, the information will only be synthesized into the indicator once per month.

**Table 6. Sample matrix listing monitoring and evaluating program activities**

Indicator	Form	Person	Frequency
<b>Input</b> Numerator: number of community cooks who passed post-test Denominator: number of community cooks who attended training	Training form	Nutritionist Field Worker	Monthly
<b>Output</b> Number of days chicken livers were incorporated into recipes	Menu review form	Nutritionist Field Worker	Monthly
<b>Outcome</b> Numerator: number of parents reporting that their children ate chicken liver at community kitchens Denominator: total number of parents interviewed with children under 2 years old	Food frequency questionnaire	Nutritionist Field Worker	Every 3 months Baseline End line
<b>Impact</b> Numerator: number of children with hemoglobin values below anemia cutoff Denominator: total number of children under 2 years old who were measured	Blood indexes form	Laboratory technician	Baseline End line

Source: Adapted from (Levinson et al., 2000).

### ***Planning the evaluation of the program***

Evaluating program outcomes and impacts (i.e., determining if the program has had the anticipated effects and whether any observed effects were due to program activities) involves the following five steps:

- Choosing the evaluation design
- Determining the sample size
- Identifying the comparison group (depending on the type of evaluation design chosen)
- Assessing confounding factors
- Attributing impact to the program implemented.

*Choosing the evaluation design.* There are many evaluation designs to choose from. The selection of a program impact evaluation design is generally based on the following four considerations:

- The precision of the data required to reach a reasonable conclusion that the program being evaluated has been effective (i.e., produced a significant impact)
- The selection of an appropriate comparison group
- The availability of resources

Regardless of the design, all evaluations should include at least a baseline and an end line assessment (also called pre-/post-study). Many program managers make the mistake of not conducting a baseline survey before initiating program activities. Comparing outcome and impact indicators in the program group to the same indicators in a comparison group only at the end of the program is a commonly used but very weak design.

Habicht et al. (Habicht et al., 1999) have proposed a useful way of classifying the various approaches generally available for evaluating impact of public health intervention programs on the basis of three levels of inference: adequacy, plausibility, and probability. The selection of one of these approaches will determine the level of confidence that one can make that an intervention caused the effect observed. For comparison, several evaluation designs are summarized in Table 7 and discussed.

**Table 7. Different types of program evaluation designs,<sup>a</sup> and the inferences that can be drawn from them<sup>b</sup>**

Design	Inference	Comments	References
Pre-/post-study design without a comparison group	Adequacy	The lack of a comparison group identified at the start of the program makes it difficult to attribute changes in the intervention group to the program. Programs that use this approach should attempt to gather information on confounders - other factors that might be causing changes in behaviors and/or nutritional status such as government radio spots or changes in food prices or availability.	(Monteiro, 1987)
Time-series design	Adequacy	This requires multiple measures of indicators before the start of the program to establish a trend in the direction and magnitude of change of the indicator (e.g., the proportion of children with a weight-for-age z-score < -2). The analysis then examines whether the rate of change was significantly hastened after the initiation of the program.	(Mora, 2007)
Pre-/post-study design with non-randomized comparison group	Plausibility	The comparison group is purposively selected to be as similar as possible to the intervention group. It is recommended to get the help of a statistician or epidemiologist when making a final decision.	(Lutter et al., 2008)
Pre-/post-study design with randomized comparison group	Probability	The most rigorous of designs. Often not feasible due to lack of resources or other constraints.	(Morrow et al., 1999)

a Adapted from (Levinson et al., 2000)

b (Habicht and Pelto, 2012)

An adequacy assessment is appropriate for verifying whether the outcome indicators show an improvement and reach pre-established criteria for adequacy among program recipients in tandem with a properly implemented program. For example, in an intervention seeking to improve child intake of animal source foods, adequacy could be defined as 75% of mothers feeding their child an animal-source product daily at a predetermined time after the intervention was implemented. This is the simplest and least costly type of evaluation because it does not require randomization or the use of a comparison group.

A plausibility assessment controls for the influence of external factors, often referred to as confounding factors, which might account for part or all of the observed impact. The following designs are frequently used for this type of assessment:

- **Comparable intervention and comparison groups.** For example, in Ecuador, a National Food and Nutrition Program (PANN 2000) was implemented to prevent malnutrition and anemia in young children living in conditions of extreme poverty. The program included two main interventions aimed at improving the quality of feeding practices and diets: nutrition education and counseling to mothers, and provision of a specially designed fortified complementary food for introduction to infants at 6 months of age (Lutter et al., 2008). The fortified complementary food provided significant amounts of energy and micronutrients, including iron. Taking advantage of the planned rolling implementation of the program, an intervention group was selected from communities where implementation initiated and the comparison group was selected from similar communities where the implementation would commence one year later. The monitoring and evaluation plan considered two program process monitoring and evaluation rounds, and an impact evaluation design including a longitudinal study of the intervened and comparison groups and a cross-sectional study with a baseline and a final assessment of the two groups. Infant feeding practices and dietary intake were used as outcome indicators and anthropometric and biochemical indicators were used as impact indicators. A significant program impact was found on impact indicators such as weight gain and hemoglobin (anemia). Outcome indicators (e.g., improved infant feeding practices and dietary intake of energy and iron) supported the attribution of improved impact indicators to the program by documenting logical pathways linking program implementation to these types of outcomes. This design permitted plausible attribution of impacts to the program.
- **Historical comparison group** (comparing change before and after program implementation). For example, an evaluation of oral rehydration therapy (ORT), which was introduced in the early 1980s, on the decline in mortality from diarrhea in northeast Brazil, showed an impact by comparing mortality before and after implementation of the intervention (Victora et al., 1996). To strengthen the inference that the impact was plausibly related to the intervention, the evaluation showed that infant mortality fell from 32% in 1980 to 17% in 1989, and infant deaths attributed to diarrhea were reduced from 41% to 25% in the same 9-year period. Between 1980 and 1990, hospital admissions for diarrhea also fell from 57% to 30%. The evaluation showed that none of the other major causes of death or hospital admissions showed similar decline. ORT use by mothers in 1991 was 35% and 62% for episodes regarded as severe by the mother. Furthermore, in the analysis, a simulation model was used to estimate that changes in factors other than ORT would lead to a 21% reduction in infant diarrhea mortality, or about one-third of the decline observed.
- **Internal comparison group** (examining a dose-response relationship between the coverage/quality of the intervention and the observed outcomes in the target population). An evaluation providing acceptable evidence of impact may be made utilizing a combination of adequacy and plausibility assessments. For example, in Nicaragua a pre-/post-study design with three periodic assessments using randomly selected samples of households was used to evaluate the impact of a countrywide iron/folate supplementation program implemented from 1993 to 2005 to reduce anemia in preschool-aged children (Mora, 2007). A baseline measurement of the prevalence of anemia in a randomly selected sample of the population was carried out in 1993 with two subsequent, similar measurements in 2000 and 2005. Anemia prevalence in children did not change from 1993 to 2000, a period when program coverage was low (< 30%), followed by a 40% reduction from the baseline by 2005 after a

marked increase in coverage to > 63% in the period 2000–2005. Likewise, an impact evaluation of a concomitant national vitamin A supplementation program administering vitamin A capsules to pre-school children twice a year (with sustained coverage above 90% since 1994 and enforced mandatory fortification of sugar with vitamin A beginning in 2000) resulted in a 72% decline in the prevalence of vitamin A deficiency by 2000, and a subsequent additional 27% drop by 2005, with the latter attributable to sugar fortification (Mora et al., 2005). As a result of the two interventions, vitamin A deficiency had been reduced in 2005 to 99% of the 1993 baseline. These impact evaluation designs in Nicaragua resembled a pre-/post-study design with no comparison group but random selection of the sample. It also used measures of the intensity and/or coverage of the intervention programs to examine a dose-response between the coverage of the intervention and impact and to establish plausibility that the intervention was responsible for the impact.

Probability assessments use the most rigorous design, in which a program is randomly allocated to one group of individuals (or communities) while a comparison group receives no program and includes both a baseline and end line measure. Such a design permits a probability statement that the impact was due to the intervention, based on the premise that there is only a small known probability (usually less than 5% chance) that the observed differences in the final outcomes between the intervened and the non-intervened group are due to chance. While the proper implementation of this approach provides the best probability evidence of the effect (or non-effect) of a program, it requires considerable resources. An example of a randomized controlled trial comes from Mexico. In this study, pregnant women were randomized to home visits by trained lactation counselors for three or six home visits or a comparison group (0 home visits). A significant dose-response was found in exclusive breastfeeding (i.e., among women who received a greater number of home visits (dose), more exclusively breastfed (response)). At three months postpartum, it was practiced by 67% of the six-visit group, 50% by the three-visit group, and only 12% by the 0-visit group (Morrow et al., 1999).

When randomization is not feasible for practical or ethical reasons the attribution of impact can be made with adequacy or plausibility evaluations. There are a number of alternative evaluation designs that are less rigorous than the randomized, controlled trial, as noted above and described in more detail in (Fitz-Gibon and Morris, 1987),.

*Identifying confounding factors to be included in the analysis.* Controlling for confounding factors that occur before or during program implementation is a major challenge to attributing impact in programs where implementation is not randomized nor includes a comparison group. Confounding factors are extraneous variables that correlate positively or negatively with both the dependent variable and the independent variable. Therefore, information on potential confounding factors that may account, at least partially, for the final outcomes, should be included in the analysis. In the above-mentioned evaluation of the anemia control program in Nicaragua (Mora et al., 2005), confounding factors likely to contribute to reduced anemia rates in children were considered, including trends in the incidence of infection and intestinal parasites; environmental sanitation; coverage of health services; prevalence of vitamin A deficiency and malaria; and other health and nutrition interventions (e.g., food distribution and nutrition education), as well as trends in global social and economic indicators over the period 1993–2005.

*Determining the sample size.* Once an evaluation design has been selected, the next step is to determine the sample (Levinson et al., 2000). Knowledge of how to determine the sample size is quite specialized so it is recommended that program planners enlist a statistician or epidemiologist for assistance (see also Module I). In preparation for the discussion of these issues with an expert, these items should be clearly defined (Levinson et al., 2000):

- The number of groups of interest being studied, if more than one (e.g., rural and urban participants, communities receiving all program activities and those receiving a subset of activities)
- The key indicators that will describe outcomes (e.g., the proportion of children consuming meat products daily)
- The amount of change expected in each indicator (e.g., increase in the proportion of children consuming meat products daily from 30% to 40%).

With regard to the “amount of change expected in each indicator,” programmers tend to hypothesize that their programs will have effects that are larger than is realistically achievable. For instance, a 25% decrease in the prevalence of malnutrition (e.g., in height-for-age) would be difficult to achieve through a single program implemented over a relatively short (e.g., 3- to 5-year) time frame. The statistician will use these three pieces of information, along with a measure of the level of confidence needed to draw conclusions and the probability of detecting a difference in the indicator, if one actually exists, to calculate the sample size needed to test the hypothesized effects.

*Selecting the sample* The other specialized step is the selection of whom to sample. The decision on whom to sample should depend on the intervention target population. For example, if the intervention was targeted at health providers, they should be the ones sampled. If the intervention was targeted at children, they should be the ones sampled. Another decision is the kind of sample to choose (see Step 2 in Module 1). Options include simple random sampling, stratified sampling, or systematic sampling (Levinson et al., 2000). Cluster sampling is used for large samples and beyond the scope of this Module. The choice of which of these ways to choose samples depends to a great extent on such factors as how dispersed the population being studied is and the existence of a complete population registry. Information on these factors will facilitate the discussions with the statistician.

*Identifying a comparison group.* In identifying a comparison group, it is important to keep in mind that “individuals (or communities) in a comparison group must be identical, or as similar as possible, to the group of program participants” (Levinson et al., 2000). The best way to achieve this is to randomly select the communities or individuals that will participate in the program and those that will not. If the program will be phased in over time to different communities, those that will receive the program activities first can be randomly selected while those receiving the program last can be assigned to the comparison group.

### ***Developing a timeline***

Finally, all monitoring and evaluation activities should be specified in a timeline that considers program implementation activities outlined in the intervention plan ([Module III](#)) as well. Table 8 shows an example of a monitoring and evaluation timeline.

**Table 8. Sample monitoring and evaluation timeline**

Activity	Year 1				Year 2			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Complete intervention plan and monitoring and evaluation plan	X							
Develop forms for gathering monitoring and evaluation data	X							
Hire and train field workers for baseline evaluation	X							
Carry out and analyze baseline evaluation	X							
Develop curriculum for training community cooks		X						
Train community cooks in adding chicken liver to recipes		X	X	X	X	X		
Collect monitoring information on training of community cooks		X	X	X	X	X		
Collect monitoring information on chicken livers incorporated into recipes by community cooks		X	X	X	X	X	X	X
Carry out and analyze end line evaluation								X

## Matrix for identifying components of the monitoring and evaluation conceptual framework (Form IV-1.1)

Goals:				
Inputs →	Outputs →	Outcomes →	Impacts →	Benefits
Monitoring		Evaluation		

**Matrix for determining what monitoring data should be collected and how often  
(Form IV-1.2)**

Information	Frequency	1. Useful?	2. Already being collected?	3. Feasible to collect?
Input				
Output				
Outcome				

**Matrix for listing monitoring and evaluating program activities (Form IV-1.3)**

Indicator	Form	Person	Frequency
Input Numerator: Denominator:			
Output			
Outcome Numerator: Denominator:			
Impact Numerator: Denominator:			

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**24-hour Dietary Recall and Anthropometry** – research method in which the *caregiver*<sup>31</sup> is asked to recall (remember) what, how much, when, and how often food and liquids were consumed by the child the previous day, and anthropometric data (child's height, weight, etc.) are collected to assess nutritional status

**Audience segmentation** – separation of *target population* into sub-groups based on specific characteristics (e.g., age, marital status, employment)

**Barrier** – obstacle to caregiver compliance with *ideal practices*; can be internal (e.g., knowledge, belief, perception) or external (e.g., person, place, policy); opposite of facilitator

**Behavior** – action related to child nutrition (e.g., *caregiver* food preparation or child feeding practices, or counseling provided by health worker)

**Behavior change** – change in behavior that occurs through a series of stages (e.g., awareness, motivation, intention, trial, and adoption)

**Caregiver** – person cares for an infant or young child and is responsible for decisions regarding feeding. Usually, but not always, it is the mother

**Caregiver Survey** – research method used to assess infant and young child feeding practices, socioeconomic characteristics, and *caregiver* access to *communication channels*, plus knowledge of HIV/AIDS-related practices

**Communication channel** – technique or type of media through which a recommendation or message reaches the *target population*; may be interpersonal, through mass media (e.g., television or radio), or personal, through the dissemination of printed material, and may differ by *audience* segment

**Community** – multilevel concept referring to a population or entity with shared interests and/or characteristics defined geographically (e.g., village, city, nation, or region)

**Community participation** – involvement of a *community* in a social-change strategy

**Comparison group** – control group

**Complementary feeding** – stage when infants and young children begin to consume foods and liquids to complement breast milk. As per WHO recommendations, complementary feeding should begin at 6.0 months (180 days) of age

**Complementary foods** – foods and liquids introduced into the diets of infants and young children to complement breast milk. These foods are often specially prepared for young children but can also include foods prepared for family consumption

<sup>30</sup> The definitions in this glossary are specific to the context of ProPAN.

<sup>31</sup> Words in italics are also defined in this glossary.

**Confidence interval (CI)** – level of confidence that the sample mean or prevalence is an accurate estimate of the population mean or prevalence. Most researchers use a 95% CI, which roughly translates to the estimate capturing the true value in the population 95% of the time (and not capturing the true value 5% of the time)

**Confounding factor** – extraneous variable that correlates (positively or negatively) with both the dependent and independent variable

**Counseling** – process involving information-sharing, mutual understanding, and/or agreement between two or more people. In infant and child feeding, it may include assessment of *current practices* through discussion with *caregivers* and the provision of options to improve infant and child health and well-being

**Coverage** – proportion of *target population* that receives an intervention or program

**Current practice** – practice that affects infant and young child feeding; compared to ideal practices to identify suboptimal feeding behaviors that could be targeted for improvement through an intervention

**Delivery platform** – program or other structure or entity through which an intervention is delivered (e.g., health facilities and community organizations)

**Dish** – mixing of various foods according to a recipe

**Energy density** – amount of energy in 1 g of food (expressed in kilocalories)

**Facilitator** – any internal or external factor (e.g., behavior, belief, knowledge, perception, person, place, or policy) that helps or motivates *caregiver* compliance with an ideal practice; opposite of *barrier*

**Focus Groups** – qualitative research method (interviews) in which 6–8 individuals with similar characteristics are brought together to discuss a specific subject in order to obtain spontaneous viewpoints

**Food Attributes Exercise** – qualitative research technique in which the *caregiver* is shown images of 20–30 different foods to elicit her beliefs about the qualities of each food and its adequacy for infants and young children

**Food Composition Table (FCT)** – *ProPAN* includes a multi-region Food Composition Table (FCT) that contains values for energy, protein, carbohydrates, iron, zinc, vitamin A, vitamin C, calcium, phytates and other vitamins and minerals of approximately 2000 foods to use in the software for analysis of the 24-hour Dietary Recall and Market Survey. The FCT was initially compiled by the Instituto Nacional de Salud Pública (Mexico) and has been updated by adding foods from Brazil, Jamaica, Mexico, Panama, Kenya, Egypt, India, Senegal, Indonesia, Tanzania, Malawi, and Mali, the USDA National Nutrient Database for Standard Reference 23, and the Central American (INCAP) table.

**Ideal practices** – set of 12 optimal breastfeeding and *complementary feeding practices* identified in *ProPAN* and compared to *current practices* to determine gaps; gaps indicate suboptimal practices that if modified as recommended are likely to have a positive impact on nutritional status

**Ingredients** – components of a dish

**Intake** – amount of food and liquid consumed by infant or young child within a specific period

**Interpersonal communication** – sharing of information and feelings between two or more people, including *counseling*; also called *face-to-face communication*

**Institutional review board (IRB)** – also called ethical review board, is a committee that has been formally designated to approve, monitor, and review biomedical and behavioral research involving humans

**Intervention** – project or program activity or activities designed, planned, and implemented to modify infant and young child feeding practices and improve nutritional status

**Intervention plan** – detailed description of activities and resources that are required to carry out an *intervention*

**Kilocalories** – unit of measurement for energy content of food corresponding to 1 000 calories

**Market analysis** – technique used to compare foods to identify those that provide the greatest energy and nutrients for the least cost

**Market Survey** – research method used, to collect information on food cost and availability throughout the year

**Matrix** – rectangular array of elements arranged in columns and rows to organize and summarize information collected through qualitative or quantitative methods

**Monitoring and evaluation system** – A system that specifies the methodologies used to verify the implementation and of progress of programs, and to systematically and objectively assess achievement of program outcomes

**Nutrient** – carbohydrate, lipid, protein, vitamin, or mineral content of foods that, after digestion, is distributed by the blood throughout the body to provide energy and support metabolism

**Nutrient density** – amount of nutrient content per 100 *kilocalories* of food or liquids; calculated by multiplying total amount of nutrients by 100 and dividing result by total amount of kilocalories

**Nutrient intake** – amount of macro- or micronutrient content (e.g., protein, iron, zinc, calcium, vitamin A, or vitamin C) of all foods/liquids consumed within a specific period

**Observation** – research technique that involves noting a fact, occurrence, or other details about individuals, foods, utensils, places, behaviors, or other child-feeding aspects, documented through narrative

**Opportunistic Observations** – research method in which *Field Workers* take advantage of their proximity to *caregivers* to note various details about their behaviors (food preparation, feeding, hygienic practices, etc.) and interactions with infants and young children

**Optifood** – software program developed by WHO and its partners to help participants formulate and test food-based recommendations, select the lowest-cost nutritionally optimal diet for a *target population*, and identify nutrient requirements difficult to meet through diets based on locally available foods

**Positioning** – Status of a product, message, or recommendation in the mind of a *primary*, *secondary*, or *tertiary audience*, or the context in which it is promoted

**Primary audience** – person or persons who are expected to carry out recommended practices; in the case of child and infant programs, these are often but not always the child's primary *caregiver*

**Problem practice** – *current practice* that deviates (in the negative sense) from an *ideal practice*

**Product** – outcome or result of the use of a research instrument or method

**Program impact pathway** – pathway from intervention input through programmatic delivery to target population

**Purposive [sampling]** – type of non-probability sampling that targets a specific population and that is used when there is a limited number of people that fill the criteria to be included in the study

**Recipe** – set of directions with a list of ingredients and amounts for preparing a dish

**Recipe Creation Exercise** – method used to create new or improved recipes from available, accessible, and acceptable foods for infants and young children through the active participation of their *caregivers*

**Responsive feeding** – a feeding mode that emphasizes attention and a positive reaction to the child's hunger and satiety cues

**Seasonality** – months in which a specific food item is available locally

**Secondary audience** – person or persons influencing a *primary audience* in *practices* that affect infant and young child nutrition. The secondary audience for a *caregiver* primary audience can include family members, friends, neighbors, and health workers. For a health worker primary audience, the *secondary audience* can be work supervisors or colleagues, or peers at other institutions. The secondary audience may teach, support, and/or reinforce recommended practices to the primary audience

**Semi-structured Interviews** – conversations with *caregivers* that follow general guide of open-ended questions designed to elicit information on perceptions, beliefs, and opinions on infant and child feeding *practices*

**Session Facilitator** – person who facilitates training and discussion sessions

**Social and behavior change communication (SBCC)** – evidence- and theory-based communication intervention focused on modifying social and individual norms, attitudes, and behaviors to promote the nutritional well-being of vulnerable populations

**Study community** – community selected for assessment of infant and young child feeding practices

**Tare** – to “zero out” the weight of an empty food or liquid container on a food scale (i.e., make the food scale numbers return to zero) so that the food scale will only weigh the food that is then placed in the container

**Target population** – target of the intervention (caregivers, family members, health workers, village leaders, religious leaders, politicians, etc.)

**Tertiary audience** – decision-makers, sponsors, strategic allies, or other influential persons who contribute to the success of a program or intervention through advocacy, funding, or the creation of an enabling environment

**Test of Recommendations** – research method used to evaluate the feasibility and acceptability of specific recommended feeding practices under typical conditions via home visits conducted over a short time frame of one or two weeks

# Abbreviations . . .

AIDS	acquired immune deficiency syndrome
BFHI	Baby-Friendly Hospital Initiative
CDC	U.S. Centers for Disease Control and Prevention
CI	confidence interval
DHS	Demographic and Health Surveys
g	gram(s)
GAIN	Global Alliance for Improved Nutrition
HIV	human immunodeficiency virus
IMCI	integrated management of childhood illnesses
INCAP	Institute for Nutrition for Central America and Panama
IYCF	infant and young child feeding
IYCN	infant and young child nutrition
kcal	kilocalories
MUAC	mid-upper arm circumference
MoH	Ministry of Health
NGO	nongovernmental organization
PAHO	Pan American Health Organization
PIP	program impact pathway
SBCC	social and behavior change communication
UNICEF	United Nations Children's Fund
WHO	World Health Organization

## Additional resources . . .

Below is a list of websites and publications that can provide more information about the subjects presented in this document. All websites were effective as of January 2013.

### **General nutrition**

WHO Nutrition

<http://www.who.int/topics/nutrition/en>

PAHO Nutrition

[www.paho.org/alimentacioninfantil](http://www.paho.org/alimentacioninfantil)

UNICEF Nutrition

<http://www.unicef.org/nutrition>

Food and Agriculture Organization

<http://www.fao.org/food/en>

Global Alliance for Improved Nutrition

<http://www.gainhealth.org>

Infant and Young Child Project

<http://www.iycn.org>

1,000 days

<http://www.thousanddays.org>

Alive and Thrive

<http://www.aliveandthrive.org>

Food and Nutrition Technical Assistance III Project (FANTA)

<http://www.fantaproject.org>

### **Nutrition data collection**

Nutrition Took Kit

<http://www.micronutrient.org/nutritiontoolkit>

Feeding Practices Monitoring Tool

[www.manoffgroup.com/IYCN\\_complementary\\_feeding\\_monitoring\\_tool\\_083111.pdf.pdf](http://www.manoffgroup.com/IYCN_complementary_feeding_monitoring_tool_083111.pdf.pdf)

Infant and Young Child Feeding Practices. Collecting and Using data: a Step-by-Step Guide

<http://windowofopp.files.wordpress.com/2010/12/final-iycf-guide-iycf-practices.pdf>

## ***Breastfeeding***

Baby-Friendly Hospital Initiative (BFHI)

<http://www.who.int/nutrition/topics/bfhi/en>  
[www.unicef.org/nutrition/index\\_24806.html](http://www.unicef.org/nutrition/index_24806.html)

The International Baby Food Action Network (IBFAN)

<http://www.ibfan.org>

Linkages project

<http://www.linkagesproject.org>

World Alliance for Breastfeeding Action (WABA)

<http://waba.org.my>

## ***Breastfeeding and HIV***

Guidelines on HIV and infant feeding

[http://whqlibdoc.who.int/publications/2010/9789241599535\\_eng.pdf](http://whqlibdoc.who.int/publications/2010/9789241599535_eng.pdf)

## ***Program evaluation and monitoring***

United Nations Evaluation Group

<http://www.uneval.org>

Ten steps to a results-based monitoring and evaluation system: a handbook for development practitioners

[http://www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2004/08/27/000160016\\_20040827154900/Rendered/PDF/296720PAPER0100steps.pdf](http://www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2004/08/27/000160016_20040827154900/Rendered/PDF/296720PAPER0100steps.pdf)

## ***Qualitative research methodology***

Resources for program evaluation and social research methods

<http://gsociology.icaap.org/methods/qual.htm>

## ***Examples of program materials***

Counseling cards for community workers (UNICEF)

[http://www.unicef.org/nutrition/index\\_58362.html](http://www.unicef.org/nutrition/index_58362.html)

Communication materials (Alive and Thrive)

<http://www.aliveandthrive.org/resources/communication-materials>

Complementary feeding for children aged 6-23 months. A recipe book for mothers and caregivers

(FAO/government of Cambodia)

<http://www.fao.org/docrep/014/am866e/am866e00.pdf>

# Acknowledgements . . .

## **ProPAN 2.0**

The following persons and institutions participated in the updating, field testing and review of **ProPAN** from 2010 to 2012.

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### **Layout**

MS Consulting Group

### **Funding**

Global Alliance for Improved Nutrition (GAIN), Switzerland

Pan American Health Organization/World Health Organization

UNICEF, USA

US Centers for Disease Control and Prevention, USA (in kind contribution for software development)

## **ProPAN 2004 edition**

The following persons and institutions participated in the conceptualization and development of the **ProPAN** manual and software between 1997 and 2004.

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We also acknowledge the many individuals who contributed to the process evaluation, data collection, field testing, application, editing and review. Funding for the first edition was provided, in part, by the International Association of Infant Food Manufacturers.





*ProPAN* is available at no cost in English, Spanish, and French at  
[www.PAHO.org/ProPAN](http://www.PAHO.org/ProPAN)

