


Programming for Infant and Young Child Feeding
a training course

Selected Interventions for Improving Complementary Feeding

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Presentation objectives

1. To describe the assessments needed for comprehensive programming for complementary feeding
2. To describe tools for assessment and programming for complementary feeding
3. To illustrate ways to improve feeding practices and nutrient quality of diets from 6-24 months
4. To describe an approach for prioritization of complementary feeding interventions based on the local context

Issues related to programming for complementary feeding

- There is a need for added emphasis in IYCF programmes on this component in addition to breastfeeding.
- It has to be based on the recommendations in the Global Strategy for infant and young child feeding, the Guiding Principles for feeding of children 6-24 months and other recent evidence (Lancet 2008, Lancet 2013).
- It has to be based on assessment of local situation, tailored to the local context. There is no “one size fits all”.

Assessments: why are they important?

- integral part of programming, needed to understand the baseline situation and to follow trends and evaluate impact post interventions
- several rich sources of information already available for nutrition and food security, conducted both in emergency and non-emergency situation in countries

Types of information needed for assessment of complementary feeding practices

Guiding Principles for Complementary Feeding of the Breastfed Child



1. Exclusive breastfeeding (EBF) for 6 months and introduction of complementary foods at 6 months
2. Maintenance of BF for up to two years and beyond
3. Responsive feeding
4. Safe preparation and storage of complementary foods
5. Adequate amount of complementary foods needed
6. Appropriate food consistency
7. Adequate meal frequency and energy density
8. Adequate nutrient content
9. Use of vitamin-mineral supplements or fortified products for infants and mother
10. Increase feeding during illness and after illness (e.g. diarrhea)

Updated IYCF Indicators

8 Core Indicators:

1. Early initiation of breastfeeding
2. Exclusive breastfeeding under 6 months
3. Continued breastfeeding at 1 year
4. Introduction of solid, semi-solid or soft foods
5. Minimum dietary diversity
6. Minimum meal frequency
7. Minimum acceptable diet
8. Consumption of iron-rich or iron-fortified foods



7 Optional Indicators:

1. Children ever breastfed
2. Continued breastfeeding at 2 years
3. Age-appropriate breastfeeding
4. Predominant breastfeeding under 6 months
5. Duration of breastfeeding
6. Bottle-feeding
7. Milk feeding frequency for non-breastfed children

WHO, UNICEF. 2008. Indicators for assessing infant and young child feeding practices. Part I: Definitions.
<http://www.who.int/nutrition/publications/infantfeeding/9789241598664/en/>

WHO, UNICEF. 2008. Indicators for assessing infant and young child feeding practices. Part II: Measurement.
<http://www.who.int/nutrition/publications/infantfeeding/9789241599290/en/>

Global indicators for complementary feeding

The new indicators include several aspects of feeding:

1. Introduction of solid, semi-solid or soft foods (6-8 months)
2. Minimum meal frequency:
Proportion of breastfed and non-breastfed children 6-23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more

The feeding frequency should be 2 for 6-8 months, 3 for 9-23 months, 4 for 6-23 months (if not BF)

Global indicators for complementary feeding

3. "Minimum dietary diversity":
Proportion of children 6-23 months of age who receive foods from 4 or more food groups
4. "Minimum acceptable diet" is a composite indicator:
Proportion of children 6-23 months of age who had both minimum frequency and diversity (in both BF and non-BF children)

Features of the new indicators for complementary feeding

- Previously, limited information on status of complementary feeding practices was a major obstacle to programming.
- The old indicator, "number of infants aged 6-9 months that are receiving breastmilk and complementary foods" was not very useful: no information on quality of diet and meal frequency, also only limited to BF children.

Features of the new indicators for complementary feeding

- Uses and limitations of these indicators:
Assessment and global reporting not for screening nor for "prescribing". Programs will require more complex and complete sets of assessments/screening
- Not stand-alone indicators: for example, increasing frequency without diversity is not enough
- Only a limited subset of feeding practices, need for developing indicators for other dimensions (e.g. responsive feeding)

Linking the guiding principles to global indicators

Guiding Principle	Corresponding Indicator
Exclusive breastfeeding (EBF) for 6 months	→ EBF rate (0-6 months)
Timely introduction of complementary foods at 6 months	→ Introduction of solid-semisolid and soft foods (6-8 months)
Maintenance of BF for up to two years and beyond	→ BF rate at 2 years (18-23 months)

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Guiding Principle	Corresponding Indicator
Adequate amount of complementary foods needed	→ Feeding frequency
Adequate meal frequency and energy density	→ Feeding frequency
Adequate nutrient content	→ Dietary diversity
Use of vitamin-mineral supplements or fortified products for infants and mother	→ Use of vitamin/minerals
Increase feeding during illness and after illness (e.g. diarrhea)	→ Increased fluid intake (not part of IYCF indicators, but usually available in diarrhea modules of surveys)

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Guiding Principles without global indicators

Some of the principles don't have a population level indicator, such as:

1. Responsive feeding
2. Safe preparation and storage of complementary foods

They can be assessed through other methods including qualitative studies, and smaller scale surveys.

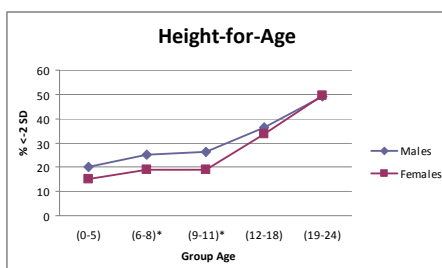
Additional information needed to understand complementary feeding practices

- Household food insecurity and intra-household food distribution
- Knowledge, attitudes and practices on feeding and care practices
- Detailed 24-hour recall of what children were fed
- Availability of local foods in market/own production
- Anaemia rate (and data on iron deficiency, if available)
- Other aspects affecting feeding (e.g. HIV-AIDS, emergency)

Household surveys such as DHS (Demographic and Health Surveys) and MICS (Multiple Indicator Cluster Surveys) and other Nutrition and Food Security Surveys can provide a lot of the above information without need for additional data collection.

Breakdown of information from these surveys for important sub-populations (especially by gender, income, etc.) can provide valuable information.

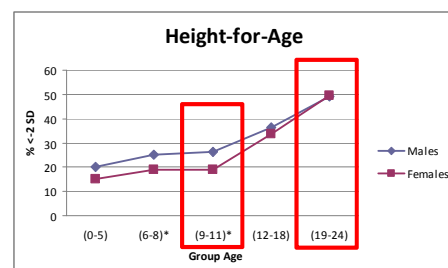
Differences in complementary feeding practices for boys and girls can lead to gender differences in growth pattern: Example from Bangladesh



*(P= 0.045)

Moreno Londono AM, Arabi M. Analysis of DHS 2004 – Bangladesh. Nutrition Section. UNICEF New York:2009.

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Example of using anthropometric data from DHS-Gender differences in height in Bangladesh

In this particular population, there is a significant difference in growth between boys and girls.

This analysis can lead us towards assessing feeding behaviors for boys and girls in these age groups and addressing the inequalities with targeted interventions.

Assessing food security

Food security is a crucial element in addressing complementary feeding.

Often, the programmatic approach would be different for food-secure versus food-insecure populations.

Approaches to food security assessments

There is no single standard method for assessing food security in emergencies – agencies developed their own methods

Three groups:

1. Early warning and surveillance approaches
depends on the continuous collection and interpretation of information
2. Economic and livelihoods approaches
food security seen within a broad economic or livelihoods (means of living) context
3. Nutritional status approaches
FS has an indirect effect on nutritional status and is assessed also as a factor that impacts on nutritional status

Various indicators for food security

Categories of indicators	Examples of indicators
Food availability	Rainfall Crop production Livestock holdings and status
Food access	Income and food sources Essential expenditure Assets Livelihood strategies Market prices of key staples and assets Coping strategies
Food utilization	Nutritional status Health status Feeding practices Food consumption

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Nutrient intake assessment

- Individual level
 - Weighed food intake
 - 24-hour dietary recall (adjusted for day-to-day variation)
 - Quantitative Food Frequency Questionnaire (FFQ)
- Population level
 - 24-hour dietary recall
 - Food Frequency Questionnaire

Additional formative research

- Nutrient quality of complementary foods and caregiver characteristics
- Typical energy density and meal frequency, food consistency, time and fuel available for preparation of complementary foods
- Availability and affordability of animal source foods, fruits and vegetables, essential fatty acid sources
- Market availability and cost of micronutrient-dense or fortified foods

Formative research methods

- Focus groups
 - Knowledge, attitudes and practices
- Interviews
- Observations
 - Food intake, etc.

Regular programming: where data collection occurs

	Surveys	Surveillance Systems	Programme Data
Data collection/ types of assessment	<ul style="list-style-type: none"> • DHS • MICS • IYCF • National Nutrition Surveys • WFP VAM (World Food Programme's Vulnerability Analysis and Mapping Survey) 	<ul style="list-style-type: none"> • FEWS-NET (Famine Early Warning Systems Network) • PC (Integrated Food Security Phase Classification) • Disease surveillance 	Routine monitoring data for: <ul style="list-style-type: none"> • Vitamin A programme • CMAM programme (treatment of SAM (Severe) and MAM (Moderate Acute Malnutrition)) • Salt iodization • Iron supplementation • MMN programme (Multiple Micronutrient Nutrition)
Nutrition-related indicators	<ul style="list-style-type: none"> • Breastfeeding • Complementary feeding • Micronutrient deficiencies • Food security 	<ul style="list-style-type: none"> • Food prices • Food access/availability • Disease outbreaks 	<ul style="list-style-type: none"> • Vit A supplementation coverage • Numbers/trends in admissions to therapeutic feeding programmes • Salt iodization coverage • Iron supplementation coverage • MMN programme coverage

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Tools for complementary feeding assessment and programming

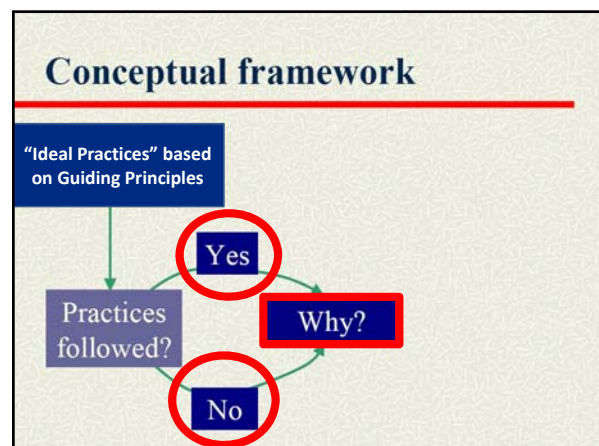
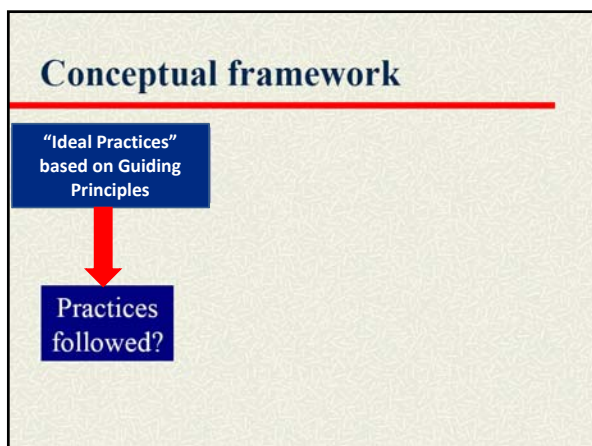
- Quantitative tools:** Dietary analyses tools (World Food Dietary Assessment System (by FAO), Optifood (linear programming tool), ProPAN)
- Qualitative tools:** Designing by Dialogue, Nutrition Program Design Assistant tool, ProPAN

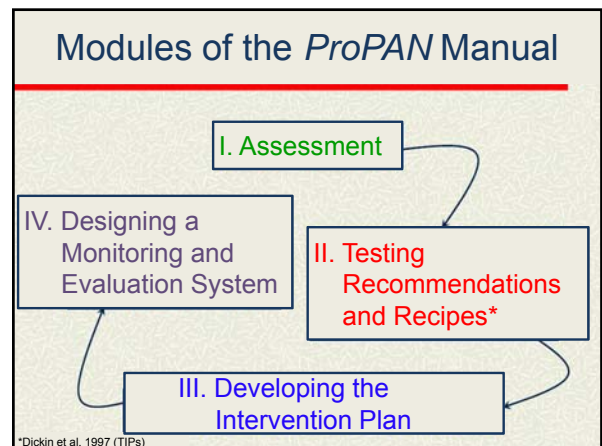
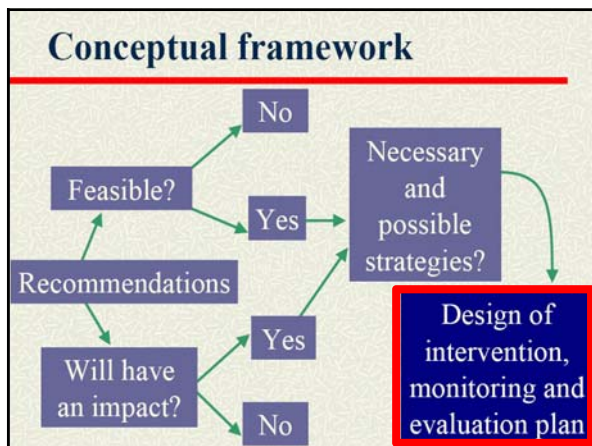
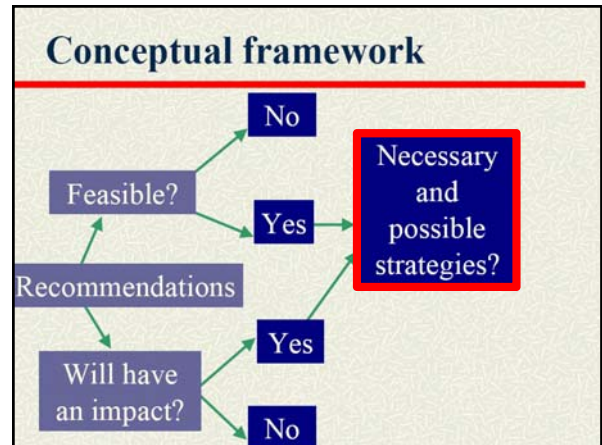
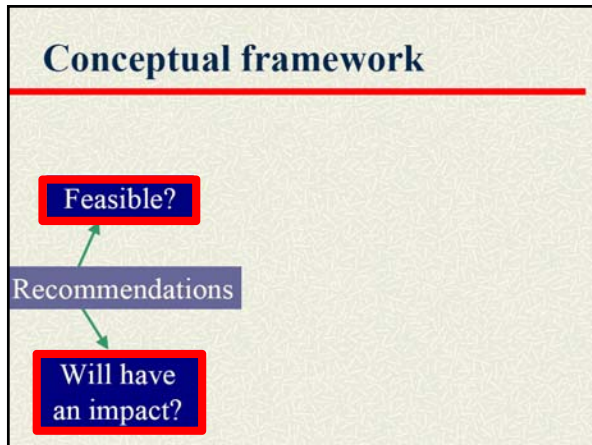
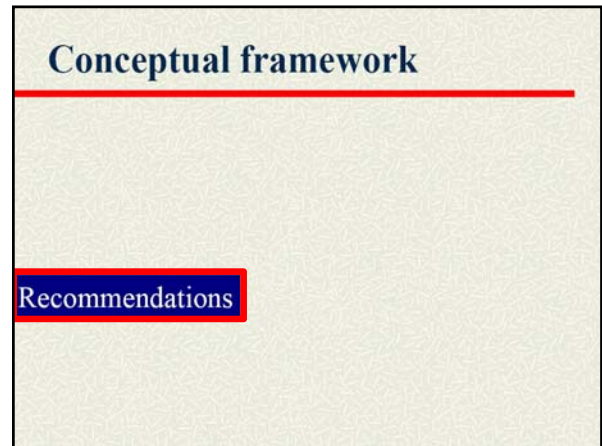
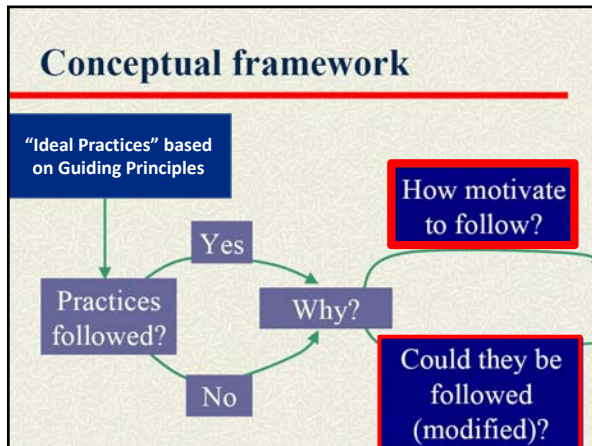
Nutrition Program Design Assistant: A Tool for Program Planners. CORE Group, Nutrition Working Group (2015)
Designing by Dialogue: A Program Planners' Guide to Consultative Research for Improving Young Child Feeding. K Dickinson, M Griffiths, (1997)

ProPAN: process for promotion of child feeding

ProPAN is a comprehensive tool which addresses essential elements necessary to design and evaluate interventions to improve BF and CF.

ProPAN: Process for the Promotion of Child Feeding (2013). (PAHO, WHO, UNICEF)
http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&Itemid=270&gid=20644&lang=en





Methods: Module I. Assessment

- ◆ Gather information
 - ❖ Quantitative and qualitative methods (n = 6)
 - General survey: breastfeeding, SES, communication
 - 24-hour dietary recall
 - Market survey
 - Opportunistic observation
 - Semi-structured interview
 - Food attributes



Methods: Mod II. Testing Recommendations and Recipes

- ◆ Creation of new or modified recipes (Optional)
 - ❖ Groups of caregivers and children, recipe preparation and acceptability
- ◆ Trials of Recommendations
 - ❖ 1-week home trials and feasibility



(Dickin et al., 1997 (TIPs))

Methods: Mod III. Developing the Intervention Plan

- ◆ Review research results
- ◆ List possible intervention strategies
- ◆ Choose among intervention strategies
- ◆ Design plan of action



Methods: Mod IV. Designing a Monitoring and Evaluation System

- ◆ Specify objectives
- ◆ Identify inputs, outputs, results, impact and benefits
- ◆ Design monitoring and evaluation system



ProPAN Process – Quantitative sections

Technique	Objectives	Min number necessary
Market Survey	<ul style="list-style-type: none"> • Provide information about the reasons why families can or cannot comply with the ideal practices • Provide information for the design of intervention strategies 	5 key informants
Caregiver Survey	Provide information about the actual breastfeeding and complementary feeding practices	75 mothers of children aged 6 to 23.9 months
24-hour Recall	Provide information about the actual complementary feeding practices	75 mothers of children aged 6 to 23.9 months

A software package in EPI-INFO is included to aid in the analysis of the quantitative data (currently under development with CDC).

ProPAN Process – Quantitative sections

Technique	Objectives	Min number necessary
Opportunistic Observation	<ul style="list-style-type: none"> • Provide information about the actual complementary feeding practices • Provide information about the reasons why families can or cannot comply with the ideal practices 	10 mothers or caregivers of children aged 6 to 23.9 months
Survey to Personnel of Health Institutions	Provide information for the design of intervention strategies	One person per institution
Food attributes exercise	<ul style="list-style-type: none"> • Provide information about the reasons why families can or cannot comply with the ideal practices; • Provide information for the design of intervention strategies 	10 mothers of children aged 6 to 23.9 months

ProPAN Process – Quantitative sections

Technique	Objectives	Min number necessary
Recipe Creation Exercise	<ul style="list-style-type: none"> Provide information for the design of intervention strategies 	Two sessions/recipe with 8 to 10 mothers with similar characteristics/session
Mothers' Semi-Structured Interview	<ul style="list-style-type: none"> Provide information about the actual complementary feeding practices; Provide information about the reasons why families can or cannot comply with the ideal practices 	10 mothers of children aged 6 to 23.9 months
Behaviour Trial	<ul style="list-style-type: none"> Provide information for the design of intervention strategies; Identify recommendations that are most feasible and with the greatest potential impact on the dietary problem identified 	5 to 6 mothers for each recommendation that will be tested

ProPAN Process – Example of a project timeline (Bolivia)

ProPAN is designed to provide a relatively quick assessment and compilation of results

June	July	August	September
<ul style="list-style-type: none"> Logistics Work plan development Hiring of personnel Training 	<ul style="list-style-type: none"> Training Data collection Data analysis, integration and interpretation: <ul style="list-style-type: none"> Market Survey General Survey 24-Hour Recall Mothers' Interview Observations Survey to Personnel of Institutions 	<ul style="list-style-type: none"> Training Data collection Data analysis, integration and interpretation: <ul style="list-style-type: none"> Attributes Recipe Creation Presentation of results 	<ul style="list-style-type: none"> Presentation of results

What can ProPAN tell us

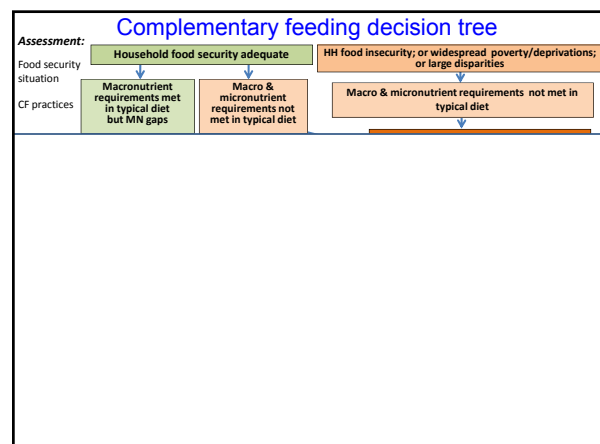
- Nutrient gaps in diets of children
- Most commonly consumed foods by children
- Food available to the household
- Cost and availability of foods and supplements in the market
- Vulnerability patterns (what are the characteristics of children worst off, what resources are available to their households)
- Barriers and facilitators of good feeding practices

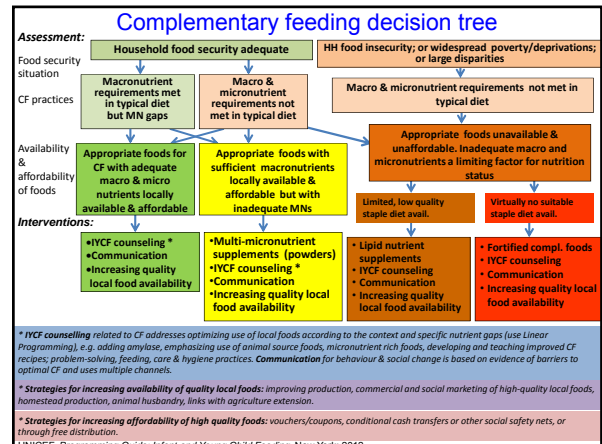
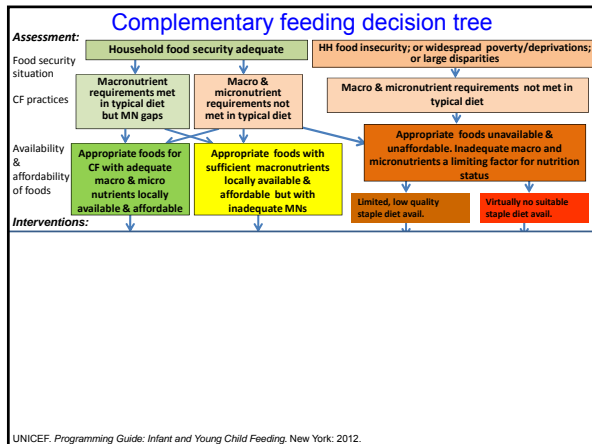
Formulating interventions

- Improving feeding practices
- Improving the quality, availability and affordability of local complementary foods including optimal use of local foods
- Additional interventions (e.g. supplementation), which need to be prioritized based on the context

Dewey K, Adu-Afaruwah S. Review article: Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries. *Maternal and Child Nutrition* 2008; 4: 24-85.

How to prioritize additional interventions?






Formulating interventions:
improving feeding practices

Improving feeding practices

- General IYCF counselling and problem-solving
- Communication for behavior change



(covered in the general IYCF programming presentation in this course)

Formulating interventions:
optimal use of local foods

Optimizing use of local foods

- Recipe creation exercise based on best combination of local foods can be an effective method for improving complementary feeding practices.
- The recommendations can be used for program communication using all media, demonstration exercises to mothers.

Optimizing use of local foods: Optifood tool (formerly Linear Programming)



Used for developing food-based complementary feeding recommendations that satisfy nutritional, food, and cost considerations, answering key questions such as:

- Is it possible to provide all nutrients at recommended levels with locally available foods? What combination of foods could best do this?



Tool is under revision by WHO, old version available online at

<http://www.nutrisurvey.de/lp/lp.htm>

This analysis can use data from ProPAN to come up with more quantitative-based recipe recommendations.

Optimizing use of local foods: example from Jamaica

- 6 sessions
- 29 participants
 - Kingston only
- 12 recipes created
- All recipes analyzed and ranked
- 2 recipes chosen for household testing



Frongillo EA, Arabi M, et al. Forging a strategy to prevent early childhood malnutrition through improving complementary feeding practices and access to fortified foods. Pan American Health Organization; 2003.

ProPAN Process – Jamaica Recipe rankings

Recipe Name	Rank		
	Iron	Calcium	Zinc
Calyпсо Liver	1	11	1
Sardine Fiesta with Mangorine	9	1	9
Chicken, Callaloo Irish	2	2	3
Liver Dish	3	10	2
Veggie-Liver	4	8	4
Chicken & Callaloo Surprise w/ Crushed Irish and Mango, Orange, & Pawpaw Delight	5	6	5

Recommendations tested in households



- Give the child fruit with main meals
- Make the child's porridge thick, like the consistency of mashed potatoes
- Feed the child iron-dense foods (example recipe of "Calyпсо Liver")
- Feed the child calcium-dense foods (example recipe of "Sardine Fiesta with Mangorine")

ProPAN Process – Jamaica Results of Test Recommendations

Compliance Criteria	Sardine Fiesta with Mangorine	Calyпсо Liver	Give Fruits with Meals	Thicker Porridge
Mothers who put it to practice at least once during 10-day follow-up period*	78%	63%	89%	100%
Number of times they put recommendation to practice	Cooked 1-3 times	Cooked 1-2 times	1-4 days	1-3 days
Number of times a day they fed it to the child	1-3	1-3	1-3 times per day	1-2 times per day
Child's acceptability	Most children who were served the meal liked it and ate a lot.	Children liked it and easily ate it.	Almost all babies love the fruit and eat it well.	Some babies like it and others don't, about evenly mixed.
Intention to Continue	67%	63%	78%	44%

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Number of times they put recommendation to practice	Cooked 1-3 times	Cooked 1-2 times	1-4 days	1-3 days
Number of times a day they fed it to the child	1-3	1-3	1-3 times per day	1-2 times per day
Child's acceptability	Most children who were served the meal liked it and ate a lot.	Children liked it and easily ate it.	Almost all babies love the fruit and eat it well.	Some babies like it and others don't, about evenly mixed.
Intention to Continue	67%	63%	78%	44%

ProPAN Process – Jamaica Results of Test Recommendations

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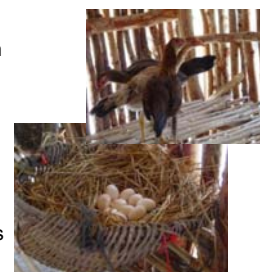
Formulating interventions: improving local availability and affordability of complementary foods

Improving the local availability and affordability of complementary foods

- Agriculture extensions, Homestead food production - such as support for production of animal foods

Example:

HKI in Bangladesh and other parts of Asia has improved dietary diversity and consumption of MN-rich foods



Nancy Haselton and Akoto Osei, Asia Pacific Regional Office, HKI, Bangkok, March 2010

Improving the local availability and affordability of complementary foods

- Social protection programs: vouchers, provision of fortified complementary foods

Example: in Mexico, provision of “mi papilla” within the national social protection program called Oportunidades, improved growth and reduced anemia

Rivera JA, Sotres-Alvarez D, Habicht JP, Shamah T, Villalpando S. Impact of the Mexican program for education, health, and nutrition (Progresa) on rates of growth and anemia in infants and young children: a randomized effectiveness study. *JAMA*. 2004; 291:2563-2570.

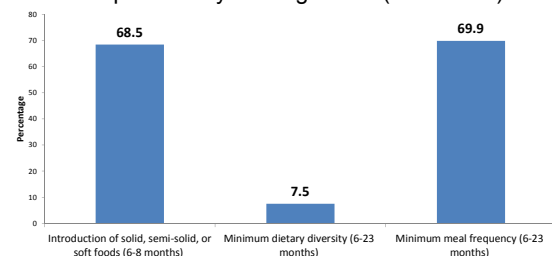
Formulating interventions: additional interventions to fill in nutrient gaps

Gaps in local diets: problem nutrients for infants

- However, a variety of gaps may be seen in various contexts, depending on availability of foods, beliefs (e.g. not giving meat or eggs to young children).
- Energy can still be a problem, especially in younger children with small stomach capacity and also in places where only thin porridges and soups are given to children. Essential fatty acids are also deficient in some diets and there is some evidence that it can limit linear growth.
- Micronutrients are also common problems for infants, especially Iron and Zinc.

Example: priority gaps in Bangladesh

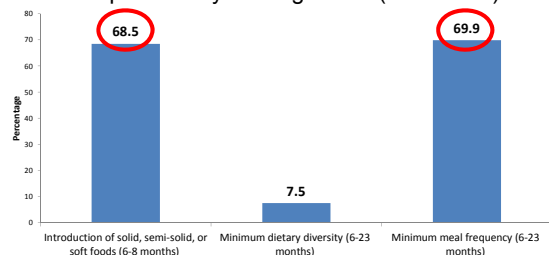
Complementary feeding status (DHS 2004)



Moreno Londono AM, Arabi M. Analysis of DHS 2004 – Bangladesh. Nutrition Section. UNICEF New York:2009.

Example: priority gaps in Bangladesh

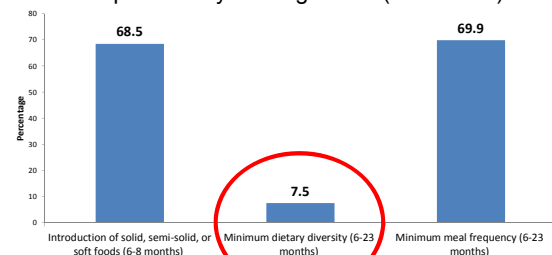
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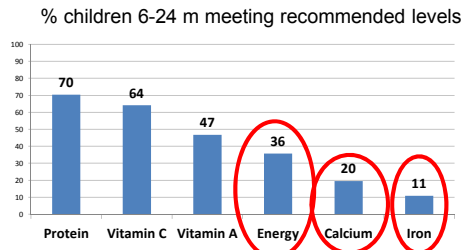
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Example: priority gaps in Bangladesh



Bangladesh, Alive and Thrive project, 2009, 24-h recall. Slide Credit: Dr Tina Sanghvi

Supplementation: micronutrient powders



- Multi-micronutrient powders (MNP): single-use 1 gram sachets, pack of 30 sachets; children aged 6 - 59 months, one dose (i.e. one sachet) each day

Composition

Vitamin A (Retinol) 400 μ	Pyridoxine (B6) 0.5 mg
Vitamin C 30 mg	B12 0.9 μ
Vitamin D 5 μ	Folic Acid 150 μ
Vitamin E 5 mg	Iron 10 mg (coated Ferrous Fumarate)
Vitamin (B1) 0.5 mg	Zinc 4.1 mg
Riboflavin (B2) 0.5 mg	Copper 0.56 mg
Niacin (B3) 6 mg	Selenium 17 μ
	Iodine 90 (Potassium Iodide)

Note: Common problem nutrients are in bold

Reminder: micronutrient requirements

Nutrient	6-8 months		9-11 months		12-23 months	
	WHO	US	WHO	US	WHO	US
Vitamin A (μg RE/day)	400	500 ^b	400	500 ^b	400	300
Folic acid (μg/day)	80	80 ^b	80	80 ^b	160	150
Niacin (mg/day)	4	4 ^b	4	4 ^b	6	6
Riboflavin (mg/day)	0.4	0.4 ^b	0.4	0.4 ^b	0.5	0.5
Thiamine (mg/day)	0.3	0.3 ^b	0.3	0.3 ^b	0.5	0.5
Vitamin B ₆ (mg/day)	0.3	0.3 ^b	0.3	0.3 ^b	0.5	0.5
Vitamin B ₁₂ (mg/day)	0.5	0.5 ^b	0.5	0.5 ^b	0.9	0.9
Vitamin C (mg/day)	30	50 ^b	30	50 ^b	30	15
Calcium (mg/day) ¹	400	260 ^b	400	260 ^b	500	700
Vitamin D (μg/day) ¹	5	10	5	10	5	15
Iron (mg/day)	9.3	11 ^a	9.3	11 ^a	5.8	7 ^a
Zinc (mg/day)	4.1	3 ^a	4.1	3 ^a	4.1	3 ^a

^aRDAs Adapted from Dewey KG and Brown KH. Food Nutr Bull 2003;24:5.

^bAI ¹IOM (Institute of Medicine). Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: The National Academy Press, 2011.

Lipid-based Nutrient Supplements (LNS)



Example: composition of a Lipid-Based Nutrient Supplement (LNS)

Energy	108 kcal	Manganese	0.08 mg
Proteins	9.5 % of total energy	Vitamine A	0.4 mg
Lipids	59 % of total energy	Vitamine C	30 mg
Calcium	100 mg	Vitamine B1	0.3 mg
Phosphorus	82.13 mg	Vitamine B2	0.4 mg
Potassium	152 mg	Vitamine B6	0.3 mg
Magnesium	16 mg	Vitamine B12	0.50 μg
Zinc	4 mg	Folic acid	80μg
Copper	0.2 mg	Pantothenic acid	1.80 mg
Iron	9 mg	Niacin	4 mg
Iodine	90 mcg	Selenium	10 mcg

Note: Common problem nutrients are in bold

Reminder: micronutrient requirements

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Monitoring and evaluation: how to strengthen complementary feeding components

- Monitoring should be planned within the program framework not as an after-thought
- Monitoring should be done using program process indicators, using both qualitative and quantitative methods
- Evaluation should look at immediate (e.g. maternal knowledge, feeding practices) as well as more distant outcomes (e.g. stunting rates)
- Using tools such as ProPAN for more detailed monitoring and evaluation of practices can complement information collected from larger surveys such as DHS and MICS

Take away message

- Effective interventions are available for improving complementary feeding. They include improving feeding practices, increasing quality and affordability of local complementary foods including optimal use of local foods, and additional interventions (e.g. supplementation), which need to be prioritized based on the context.
- Tools such as ProPAN and Optifoods can facilitate assessment, prioritization, planning and monitoring for complementary feeding programming.



Cornell University unicef

Programming for
Infant and Young Child Feeding
a training course

This training course was jointly developed by the
Infant and Young Child Feeding Unit,
Nutrition Section, UNICEF Headquarters,
and
Cornell NutritionWorks, Division of Nutritional Sciences,
Cornell University.

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