Complementary Feeding

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Nutrition in the early years of life is a major determinant of healthy growth and development throughout childhood and good health in adulthood. Breast milk is the ideal food for infants during the first 4 - 6 months of life, after that milk alone cannot provide all of the nutrients and calories for infants who need other more nutritious foods in addition to milk to meet nutrient requirement and adequate growth called "complementary food".

It is well recognized that the period from birth to two years of age is a "critical window" for the promotion of optimal growth, health and behavioral development. Poor breastfeeding and complementary feeding practices are the main causes of malnutrition during the first two years of life. For this reason, it is essential to ensure that caregivers are provided with appropriate guidance regarding optimal feeding of infants and young children.

What is complementary feeding?

Complementary feeding is defined as the process of giving other foods in addition to breast milk or infant formula, starting when milk alone is no longer sufficient to meet the nutritional requirements of the infants.

Why are complementary foods needed?

As a child is growing, milk alone is not sufficient to meet the child's nutritional needs. So complementary foods are needed to fill the gap between the total nutritional needs of the child and the amounts provided by milk. If the gap is not filled up, the child will stop growing or grows slowly. Complementary foods also help the child to get gradually accustomed to eating adult foods or family foods.

When should complementary foods be started?

Complementary foods should be started when the infants can no longer get enough energy and nutrients from milk alone, and when the neuromuscular and digestive systems are mature. For most infants this is between 4 and 6 months of age. Before 4 months, babies push food out of their mouths because they cannot fully control the movement of their tongues. At 4-6 months of age, babies can control their tongues and their digestive system are mature enough to digest a range of foods. Starting complementary feeding too early or too late are both undesirable.

Signs that a child is ready to start complementary foods are that the child is at least 4 months old and receives frequent breastfeeding but appears hungry soon or is not gaining weight adequately.

What are good complementary foods?

Good complementary foods are:

- Rich in energy, protein and micronutrients (particularly iron, zinc, calcium, vitamin A, vitamin C and folate)
- Clean and safe: no disease-causing bacteria or other harmful organisms, no harmful chemicals or toxins, no bones or hard bits that may choke a child
- Locally available and easy to prepare
- Liked by the child
- Not too sweet, salty or peppery

Appropriate complementary feeding is:

1. Timely - meaning that foods are introduced when the need for energy and nutrients exceeds what can be provided through exclusive and frequent breastfeeding;
2. Adequate - meaning that foods provide sufficient energy, protein, and micronutrients to meet a growing child's nutritional needs;
3. Safe - meaning that foods are hygienically stored and prepared, and fed with clean hands using clean utensils and not bottles and teats;
4. Properly fed - meaning that foods are given consistent with a child's signals of appetite and satiety, and that meal frequency and feeding method are suitable for age.

Guiding principles of complementary feeding

1. Practice exclusive breastfeeding from birth to 4 - 6 months of age, and introduce complementary food after 4 - 6 months of age while continuing to breastfeed.
2. Continue frequently, on-demand breastfeeding until two years of age or beyond.
3. Practice responsive feeding.

Infants and young children need assistance that is appropriate for their age and developmental needs to ensure that they consume adequate amounts of complementary food. This is called responsive feeding, including the following:-

- Feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues;

- Feed slowly and patiently, and encourage children to eat, but do not force them;

- If children refuse many foods, experiment with different food combinations, tastes, textures and methods of encouragement;

- Minimize distractions during meals if the child loses interest easily;

- Remember that feeding times are periods of learning and love, talk to children during feeding with eye contact.

4. Safe preparation and storage of complementary food are done by:

- Washing caregivers' and children's hands before food preparation and eating;

- Storing foods safely and serving foods immediately after preparation;

- Using clean utensils to prepare and serve food;

- Using clean cups and bowls when feeding children.

5. Increase food quantity and feeding frequency as the child gets older:

Start with small amounts of food and increase the quantity as the child gets older. Energy requirements from complementary foods are estimated as the difference of age-specific total energy requirement and the energy intake from milk, which are approximately 200 kcal per day for infants aged 6 - 8 months, 300 kcal per day for infants aged 9 - 11 months, and 550 kcal per day for children aged 12 - 23 months.

The appropriate number of feedings depends on the energy density of the foods and the usual amounts consumed at each feeding. As for healthy breastfed infants, complementary foods should be provided 2-3 times per day at 6-8 months of age and 3-4 times per day at 9-11 and 12-24 months of age. As for the formula-fed infants, complementary foods should be provided 1-2 times per day at 6-8 months of age, 2-3 times per day at 9-11 months of age and 3 times per day at 12-24 months. Additional nutritious snacks may be offered 1-2 times per day, as desired. Snacks are defined as foods eaten between meals, usually self-fed, convenient and easy to prepare such as fruit, bread and biscuits.

6. Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities.

As infants grow, the consistency of complementary foods should change from semi-solid to solid foods and the variety of foods offered should increase. At 4-6 months of age, the infants should eat mashed and semi-solid foods. By 8 months, the infants can eat "finger foods" (snacks that can be eaten by children alone) and by 12 months, most children can eat the same types of food as the rest of the family. Avoid foods that may cause choking such as nuts, grapes and raw carrots.

7. Diversify the diet to improve quality and micronutrient intake:

Feed a variety of foods to ensure that all nutrient needs are met. Meat, poultry, fish or eggs, vitamin A-rich fruits and vegetable should be eaten daily, or as often as possible. Iron, zinc, calcium and vitamin B6 are the common nutrients that are inadequte in complementary foods especially in developing countries and low-income families which children consume less animal products. Vegetarian diet cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used. Avoid giving drinks with low nutrient value, such as tea, coffee and sugary drinks. Limit the amount of juice to avoid dis placing more nutrient-rich foods.

REFERENCES

1. Dewey KG. Guiding principles for complementary feeding of the breastfed child. Washington DC: Pan American Health Organization, World Health Organization, 2003.
2. World Health Organization. Complementary feeding: Family foods for breastfed child. Geneva: World Health Organization, 2000.
3. American Academy of Pediatrics Committee on Nutrition. Complementary feeding. In: Kleinman RE, ed. Pediatric Nutrition Handbook. 5th ed. American Academy of Pediatrics; 2004:103-15.