

# Complementary Feeding: Feeding of an Infant Beyond 6 Months Age

## Q1

### What is complementary feeding?

Feeding only breast milk (exclusive breastfeeding) is adequate for baby till 6 months of life. After the age of 6 months, breastfeeding alone is no longer enough for optimal growth and development of the child. Hence, it is necessary to start *complementary feeding (CF)* along with breast milk. The word “*weaning*” is now replaced by complementary feeding—the process of introduction of suitable semi-solid food at the right age.

There is critical window of opportunity during the initial 2 years as far as growth and development of a child is concerned. The concept of “*1000 days*” is 9 months of pregnancy plus first 2 years of life during which optimal breastfeeding (for first 6 months of age) and timely and appropriate complementary feeding (at 6 months of age) are extremely important.

### What is complete food and balanced food?

A food containing proteins, carbohydrates, minerals, fats, vitamins, fibers, etc. is “*Complete Food*” while the food that contains these components in appropriate proportions can be labeled as “*Balanced Food*”. No food can be labeled as a perfectly complete or balanced food. So, in order to make it complete and balanced, there is need to combine various foods in a child’s diet (**Fig. 1**).

### Examples

- A cereal (rice/wheat) based food mixed with pulses/nuts, vegetables, and cooked in oil/ghee makes it a balanced food; for example, *Upma, Pulao, Biryani, and Poha*.
- A food also becomes balanced by the addition of cereals, nuts/raisins, etc. in the milk; for example, *Dalia, Kheer* (**Figs. 1 and 2**).



**Fig. 1:** Combination of these makes a balanced food.



**Fig. 2:** Kheer is one of the examples of balanced food.

## Q2

### When to start complementary feeding and why?

As discussed earlier, after the age of 6 months, breastmilk alone is no longer sufficient to provide adequate nutrition to the child, and complementary feeding must begin soon after completing 6 months of age. Moreover, the biting movement of jaw appears around 5 months. Around 6–7 months, swallowing of solid foods occurs. The side-to-side movement of tongue develops by 8–12 months. The introduction of complementary feeding around 6 months is the ideal time or “sensitive period”. If introduction of complementary feeding is delayed, then child may enter “critical period” after which the infant may always be a poor chewer and may be poor in eating solids later. The other reasons for complementary feeding at 6 months of age are:

- Child develops neck/head control and hand-to-mouth coordination.
- Child starts enjoying mouthing and biting.
- The intestines are mature and ready to digest pulses and cereals.
- Baby likes chewing and gumming semisolids as there is hardening of gums and eruption of teeth.
- Tendency to push solids out of mouth decreases.

## Q3

### Which foods should be used for complementary feeding?

**Table 1** categorizes the appropriateness of complementary foods for infants.

Table 1: Different types of complementary foods.	
Appropriate	Avoidable
Combination of cereals and pulses (Khichdi, Dal-rice, etc.), locally available staple foods such as idli, dosa, dhokla, ragi, chapati, roti, paratha with oil/ghee, and some amount of sugar.	*Biscuits, breads, pastry, chocolates, cheese, softy, ice cream, doughnuts, cakes, etc. #Tinned foods, packaged or stored foods, artificially cooked foods with preservatives or chemicals
Mashed banana, other pulpy fruits (e.g., mango, papaya), sweet potato, and potato	#Fruit juices and fruit drinks
Milk-based cereals preparations	*Commercial breakfast cereals
Sprouts, pulses, legumes, groundnuts, almonds, cashewnuts, raisins (Note: Any nut should be well grinded and mixed with food as solid pieces may cause choking in young children)	#Repeatedly fried foods containing trans-fatty-acids (which predispose to obesity, diabetes, atherosclerosis, cardiac, and neurological problems in future)

\*These foods should not form the main bulk of complementary foods and may be offered only occasionally.

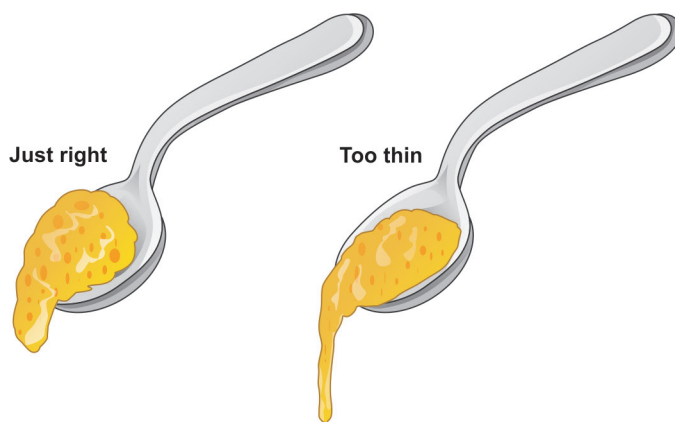
#These foods should be avoided altogether in children below 2 years of age.

**(a) What are the important attributes of foods for complementary feeding?**

- Easy availability of clean and safe ingredients for foods.
- Simple and less time-consuming method to prepare/cook the foods.
- Affordability by the family.
- Prefer the regular family food that is locally available and culturally acceptable rather than cooking special foods. The recent concept of “Baby-led Weaning”, i.e., feed as per baby’s choice shall be practiced (**Fig. 3**).
- Nutritive value of the food as per the requirement of growing infant.
- Easily digestible and nourishing food.
- Taste and palatability of food for the infant.
- Start feeding with small amounts and gradually increase the quantity with the increasing age of the child.
- The consistency, frequency, and variety should change as the infant grows, depending upon the requirements and the feeding abilities (**Fig. 4**).
- A variety of nutrient-rich foods shall be offered to ensure the body requirements.
- During illness, the principle of more fluids including frequent breastfeeding and encouragement to eat soft,



**Fig. 3:** Baby-led weaning.



**Fig. 4:** Appropriate food consistency: The food that just drips slowly from spoon and not flows.

favorite foods should be followed. After illness, promote feeding more often than usual so as to replenish the deficient intake.

**(b) What are staple foods?**

- Every community has a staple food—the food that forms the main bulk; for example, wheat, rice.
- Parents must identify the staple home-made food.
- The families can promote kitchen garden, harvesting, and processing and storing the staple food as per their choice and convenience in rural area.
- In urban areas, the staple food can be purchased depending upon their choice and affordability.
- Staple foods can be cooked, served, and are good sources of energy and protein.

**(c) What precautions are needed while preparing food for complementary feeding?**

- Follow proper hand washing with soap before preparing and eating the food.
- The foods shall be stored safely and served fresh after preparation.
- Use clean utensils for preparing and serving the food.
- Spoon, cups, and bowls used for feeding the children shall be clean.
- Avoid using feeding bottle as it is difficult to clean and maintain the hygiene. *“Bottle feeding is injurious to health of the child.”* Diarrhea, dehydration, and malnutrition are usually the results of unsafe bottle-feeding.

**(d) How to keep food safe and hygienic for feeding?**

- Keep food safe from contaminated environment.
- Food that looks fresh and smells good shall be offered.
- The perishable foods (meat, milk, etc.) and prepared food shall be stored in a refrigerator.
- Cover the food properly and feed to the child within 2 hours if refrigerator is not available.
- If stored for longer duration, reheat the food before consumption so as to kill the contaminating germs.
- Care should be taken to protect the food from rats, mice, cockroaches, flies, and dust.
- Prevent the contamination of drinking water.

**(e) How to change food consistency and type for growing child?**

- At 6 months of age, start with pureed, mashed, and *semi-solid* foods.
- Most infants can eat “finger foods” around 8 months.
- Most children can eat the family foods by the end of 1 year.
- Avoid foods that may be lodged in the windpipe (such as nuts, grapes, and raw carrots) and can result in choking.
- The following complementary food schedule can be followed (**Table 2**) as:

**TABLE 2:** Quantity, frequency, and texture of complementary foods.

Amounts of food to offer			
Age	Texture	Frequency	Average amount of each meal
6–8 months	Begin with mashed foods or thick porridges	Daily 2–3 meals along with frequent breastfeeding	In the beginning, 2–3 tablespoon-full
9–11 months	Mashed foods, finely chopped, and foods that can be picked up by baby	Daily 3 meals with continued breastfeeding plus offer 1–2 additional snacks	1/2 cup/bowl (125 mL)
1–2 years	Staple family foods, mashed or chopped (if required)	Daily 3–4 meals with continued breastfeeding plus 1–2 additional snacks	3/4 to one cup/bowl (250 mL)

*Those not being breastfed, give additional 1–2 cups of milk plus 1–2 extra meals daily.*

**(f) How to modify the nutritive value of complementary foods?**

- Nutritive value of foods can be improved by increasing the energy density of food by addition of ghee, sugar, jaggery, vegetable oils, butter, etc.
- The protein content of foods can be improved by combining cereals and pulses to ensure delivery of all essential proteins, also by using different cooking methods such as milling, germination, and fermentation of different food items.
- The viscosity of foods can be reduced by *malting* so that a child can eat more. It is the process of germinating whole grain, and then the germinated cereal or pulse is dried and grinded. Malted cereal or pulse-mixed infant foods provides more energy. Amylase-rich flour (ARF) or flours of malted foods increases the energy density of food.



- Feed with thick but smooth mixtures. Thin gruels do not provide enough energy, hence, a young infant around 6–9 months requires thick and smooth food preparations.
- The fortification of complementary foods with micronutrients such as iodine, zinc, iron, vitamin D, vitamin A, calcium, phosphorus, etc. However, this will involve commercial foods or sprinkles of micronutrients to be added to food.

**(g) What is the place of vegetables and fruits in complementary feeding?**

- Fruits and vegetables provide minerals and vitamins and thus increases nutritive value of foods.
- Green leafy vegetables, carrots, pumpkin, and seasonal fruits such as papaya, mango, chikoo, and banana are important sources of vitamin A, B, and iron.
- Include seasonal, locally available, fresh, cheap, nutritious fruits, and vegetables.

**(h) Are their some foods ‘hot’ or ‘cold’?**

There is no such concept in modern medicine. In many communities, there are deep-rooted beliefs, taboos, or misconceptions that some foods are cold or hot (**Table 3**).

**TABLE 3:** Myths related to “hot” and “cold” food.

The myth	Remarks
Jaggery, spicy food, mutton, chicken, papaya, eggs, brinjal, beet root, and mangoes are considered “hot” for the child.	<b>False...</b> In fact, children require all these items in their feeds to provide different nutrients.
Banana, curd/butter milk, ice-creams, lemon juice, guava, and other citrus fruits are “cold” for the child.	<b>False...</b> This is a wrong belief and these food items are essential for children in their diet.
Eggs and nonvegetarian foods are sometimes considered as “harmful” to the child.	<b>False...</b> Animal origin foods are special foods for children and are nutritious. But, these are not must and nutritional needs of children can be easily met by vegetarian diets, containing a variety of food items.
Ghee is heavy to digest, causes cough	<b>False...</b> Small amount of fats can be added to food to increase their energy content.
Wheat/daliya/suji is heavy.	<b>False</b>
Maggi/biscuits/marketted foods help in weight gain.	<b>False</b>

**(i) What is the place of milk and milk products in complementary feeding?**

- Milk and milk products are important in the growth of infants but, overemphasis on milk should be avoided as the child may not have appetite for anything else.
- Many parents consider dairy products, as useful sources of minerals such as calcium and vitamins. *Avoid only milk feeds; use milk to prepare foods for children.*
- Milk and milk products cannot completely replace or substitute for whole range of complementary feeds.

**Q4**

**What is dietary diversity and how to take care of it during complementary feeding?**

Dietary diversity means feeding a child different types of foods so that his/her nutrient requirements are adequately met. Minimum dietary diversity (MDD) is consumption of four or more food groups from the seven food groups to meet daily energy and nutrient requirements. **(Table 4)**. This ensures that the child had a high likelihood of consuming at least one animal-source food and one fruit or vegetable that day, in addition to a staple food (grain, root, or tuber).

**TABLE 4:** The various food groups.

<i>Recommended food group</i>	<i>Examples/Variety of foods in different groups</i>
Grains, roots, and tubers	Rice, wheat, maize, jowar, ragi, potato, sweet-potato, etc.
Legumes and nuts	Pulses, nuts, oil-seeds, dry fruits
Vitamin-A rich fruits and vegetables	Orange/yellow/green vegetables or fruits such as mango, carrot, papaya, and tomato
Other fruits and vegetables	Locally available, fresh fruits and vegetables, preferably seasonal and inexpensive
Dairy products	Milk, curd, yogurt, butter, and paneer
Eggs	Eggs
Flesh foods	Meat, fish, poultry, and organ meats

Q5

### What is the role of feeding in child's growth and development?

Nutrition of the child, especially during crucial 1,000 days, is very important for optimal growth and development of the child. The feeding practices that are satisfying and comfortable to mother and child are crucial for the emotional development. Mother and family should be motivated, encouraged, educated and, supported regarding proper feeding practices. Practice *responsive feeding* so that the child enjoys the process of feeding (**Fig. 5**). Follow the principles of psychosocial growth and development specifically:

- The parents should promote direct feeding and assist the children in self-feeding.
- Many food preparations may be refused by the child; hence, try different food combinations, with different tastes, textures and methods of encouragement.
- The feeding times are periods of learning and love—hence, talk to children while feeding and maintain eye-to-eye contact.
- Avoid comparison with other children or even siblings regarding choice of the food.
- Children under 1 year should be fed by mother/caregiver. The toddlers/young children shall preferably be fed in a separate plate promoting self-feeding with parent's help. Eating at the same time and same place by family members helps in improving appetite and avoids distractions.
- Do not force to feed the child. This way the child starts disliking food and the process of feeding.
- The distractions such as viewing TV or mobile phone while feeding is strongly discouraged.



**Fig. 5:** Practice responsive feeding.



Q6

### What is the role of commercial foods in complementary feeding?

Many commercial foods are available in market for feeding infants. They are expensive, and often have tall and exaggerated health claims. Many a times, the ready-to-use food, artificial or packaged food are easily available but may not be a healthier or suitable option for feeding children. As far as possible, child's food should be prepared at home using commonly available ingredients. Organizations involved in child health recommend that commercial foods for feeding infants and young children (<2 years) should not be promoted.

Q7

### What is the relationship of nutrition during early childhood and adult diseases?

Lack of awareness of the nutritional quality of the foods, irrational beliefs about certain foods, and cultural taboos may lead to less food intake contributing to child being undernourished. As per one scientific hypothesis, many diseases of adults (e.g., heart disease, high blood pressure, and diabetes) are related to undernutrition in fetal life and early infancy. Similarly, it is essential to prevent overfeeding the child to prevent obesity, which is also a risk factor for diseases such as high blood pressure and diabetes.

Q8

**What are the ethical issues in relation to feeding?**

The age-old beliefs, confusions, and misconceptions are further strengthened by unethical, biased, uncontrolled, and unscientific marketing practices by multinational commercial companies. We all must act to control the biased, unscientific, and exaggerated health claims about various food products available in the market. We will be wasting our human resources, if the problem related to maternal and child nutrition is not prevented.

Q9

**Can some foods cause allergy?**

Some babies may be allergic to cow's milk protein or/and soya protein. The other foods to which some children may be allergic are: eggs, peanuts and some food additives, and spices. Fortunately, these allergies are not very common in Indian children. You should consult your pediatrician, if you feel that your child is allergic to a particular food.

## Q10

### What are various myths and misconceptions related to complementary feeding?

There are many myths and misconceptions related to nutritious food such as:

- The locally available, cheap, and seasonal fruits are not good. Costly and imported fruits from other countries stored or preserved in cold storage have superior health benefits. Fruit juices are preferred and considered more nutritious over the whole fruit. We must understand that the tinned or preserved juices contain chemicals or preservatives and may be dangerous.
- Health drinks, supplements, and protein powders with “*exaggerated claims*” are more nutritious, enriched with vitamins, minerals, and micronutrients.
- Any products or foods promoted by celebrities must be good. The biased, unscientific, and misguided advertisement is neglected even by techno-savvy and highly educated individuals.
- The ultra-processed, attractively packed, costly, and cold-storage preserved food promoted by big companies are “*magic foods*”.
- Many of us have misconception that the artificially prepared, flavored, and attractively packaged commercial foods are innovative food for our children.

Finally, we must remember that we are living in “*Junk food filled world*” where the artificial food with lots of chemicals and preservatives are promoted over locally available, low cost, and fresh and clean natural and nutritious food.

*Let us remember and pledge to give the best possible, locally available nutritious food to our beloved ones.*

#### SOME IMPORTANT TIPS FOR PARENTS (BOXES 1 AND 2)

##### BOX 1: Principles to be followed for complementary feeding.

- Start complementary feeds after completion of 180 days.
- Continue breastfeeding up to 2 years of age along with appropriate complementary feeding.
- Give semi-solid food (Avoid watery food such as soups, fruit juices, and animal milk)
- Prefer home-made food (clean, fresh, cheap, and easily available)
- Prefer balanced food (Cereal + pulse + vegetables) using locally available ingredients preparations.
- Introduce one food at one time; once child starts accepting it, introduce another preparation.
- Addition of ghee, oil, oil-seed powder, fats adds to energy, and palatability of food (except in children who are overweight or obese)
- Child’s choice and preferences shall be respected. Avoid force feeding.
- Give as much as child consumes. Monitor weight of the child.

##### BOX 2: Things to be avoided for complementary feeding.

- Avoid delay in starting complementary feeding.
- Avoid outside, artificial, packaged, and commercial and *Junk foods*.
- Avoid foods with excess of sugar, salt, and trans-fatty acids.
- Avoid *ultra-processed* and *refined foods*.
- *Bottle-feeding* has only disadvantages; avoid it.
- Avoid feeding while watching television or mobile.
- Do not force to feed. Feeding should not be an unpleasant experience.
- Avoid overfeeding.
- Avoid foods that may cause choking.