Food for different age groups: “Foods for Lactating women”
Definition of Lactation

- The process of milk production. Human milk is secreted by the mammary glands, stimulates uterine contractions and begins the lactation process.
- In humans the process of feeding milk is also called breastfeeding or nursing mother.
How Does Lactation Happen?

1. Sucking stimulates nerve that sends signal to mother's hypothalamus

2. Hypothalamus stimulates the release of prolactin and oxytocin

3. Prolactin triggers milk production and oxytocin triggers the let-down response
Nutrition for Lactating women

- Nothing can replace the highly nourishing and superior quality of the breast milk.
- That is the reason, health experts advise exclusive breastfeeding for the first six months to the baby and thereafter as long as the baby and the mother desires.
- But to continue feeding the baby for six months and more, it is very much essential that the nursing mother should take good care of her health and keep a close watch on her diet.
The **diet for nursing mothers** should be rich in nutrition so that the baby remains healthy and his development is normal.

No one can argue on the point that the human **breast milk** is the best nutritional provision created by nature for the newborns and consists of all the ingredients required for the optimal growth of a child.

During the period of nursing, the need of nutrients of a woman is at an all time high.

Eating right food and taking adequate rest ensures that the baby receives the nutrients in required amount from his mother.
Importance of nutrition during lactation

1. During lactation adequate nutrition is required as infant derives all its nutrition from the mother’s milk.
2. Mother needs extra nutrition as she has to nourish a fully developed & rapidly growing infant. She needs extra nutrients to meet baby’s needs in addition to her own requirements.
3. Any inadequacy in mothers diet influence both the quality & quantity of mother’s milk secreted.
4. If mother’s diet is inadequate then she will draw her own body reserves to meet the needs of lactation at the cost of her own health.
5. Nutrient deficiency can lead to lower levels of nutrients in the mother’s milk.
Nutritional requirement during lactation

- **Energy requirement:**
  - Lactating mothers need additional energy for production of milk.
  - During pregnancy approximately 600-850 ml milk is secreted daily.
  - Energy content of mother’s milk and efficacy of conversion of food energy into milk energy determines the energy requirement of a lactating woman.
  - During first 6 months of lactation – additional 550 kcal/d energy is required. During 6-12 months of lactation- additional 400 kcal/d energy is required
Protein requirement:

- During lactation protein needs also increases as mothers milk contains 1.15g of protein/100ml.
- For proper milk production, adequate amounts of good quality protein or good quality protein should be included in the mother’s diet.
- During first 6 months of lactation - 75g of protein is required everyday
- During 6-12 months of lactation – 68g of protein is required everyday
**Calcium:**

- Additional calcium is required for breast milk secretion. 30-40mg of calcium is secreted per 100ml or 300mg of calcium per 850 ml of milk.

- Additional intake of calcium is essential to enable the retention of calcium in breast milk.

- Adequate dietary calcium intake during lactation meets the mother’s calcium needs and extra calcium requirement for breast milk production.
Iron:

- Iron requirement during lactation is the addition of the requirement of the mother & required to make up the iron secreted in breast milk.

- Most of the lactating woman have lactation amenorrhea, resulting in saving of 1mg of iron per day which would otherwise lost in the menstrual blood.

- The requirement of iron is same as the non pregnant woman
Vitamin A:

- Breast milk is rich in vit A so lactating mother needs adequate amount of vitamin A in their diet.
- Average amount of vitamin A secreted in mother’s milk is 350µg/d retinol.
- Eggs, cheese, oily fish, fortified margarine, milk and yogurt are some of the foods that have a high content of vitamin A and therefore they are considered to be very beneficial for the health of a breastfeeding mother.
- Liver also constitutes of a food that is considered to be one of the most important vitamins during breastfeeding but it should not be taken on a regular basis.
Vitamin C:

- Breastfeeding mothers require more of vitamin C in comparison to normal people because vitamin C helps them in fighting off infections such as surgery, cold or some minor injuries.
- Vitamin C is also helpful for the baby because it provides iron to the body that avoids anemia.
- Vegetables and fruits should be taken in excess in order to get complete supplements of vitamin C.
- Broccoli, papaya, cauliflower, kale and strawberries can be taken in excess in order to provide good supplements of vitamin C to the body.
Vitamin B12:

- Vitamin B12 is a vitamin that belongs to the B group and is popularly named cobalamin that helps in the formation of new cells in the body.
- Fatty acids are made from this vitamin and at the same time it also helps in keeping the health of the nervous system intact.
- Fish, eggs, meat and milk are some of the foods that are considered to be rich sources of vitamin B12 and breastfeeding mothers should make it a point to take this vitamin in the daily diet.
Folic acid or Vitamin B9:

- Folic acid or vitamin B9 is also a vitamin that is considered to be very important for breastfeeding mothers.
- The main foods that have a high content of vitamin B9 are spinach, asparagus, cabbage, wheat, orange juice, chickpeas and corn.
Vitamin D:

- Vitamin D is not only considered to be one of the most important vitamins during breastfeeding but it is also considered as a very important vitamin that is needed by the baby because it strengthens the bones and avoids instances of the baby developing rickets.
- Sunlight is the main source of vitamin D and apart from sunlight foods like liver, salmon, tuna and kidney can be taken as products that are very high in vitamin D content.
OILY FISH SUCH AS SALMON, TUNA AND MACKEREL
Omega-3s, vitamin D

MILK
calcium, vitamin B2, B5, B12

BROCCOLI
vitamin C, vitamin K

SPINACH
iron, vitamin E

ORANGES
vitamin C, folic acid

AVOCADOS
vitamin B2, B5, B6

EGGS
vitamin B, iron, vitamin E

CARROTS
vitamin A

OYSTERS
zink
A list that throws light on the diet for nursing mothers

1. Drink More Water at Regular Intervals

- **Breast milk** constitutes 88 percent water by weight. On the first day of the delivery, the breast milk volume is around 50 ml and it goes on to increase up to 750ml per day as the baby grows and his need for milk increases.

- That is why, the most critical nutrient for ensuring ample production of milk in mother is adequate intake of water at regular intervals so that it is ready for the baby when he demands.
- A feeding mother should drink at least 2 liters of water each day or even more depending upon the need.

- If you are thirsty, it indicates that your body is short of water and you should immediately fulfill your body’s need for fluid.

- Apart from plain water, you can also drink variety of nutritious fluids including juice, soup and milk.
2. Eat Healthy and Enough Food

- You need to have enough nutrients and energy in your body to provide properly balanced breast milk to your baby.
- As a nursing mother, you must add around 500 kcal to your every day diet.
- Try to include variety of fruits such as vegetables, fruits, fiber and proteins, poultry, fish, beans, eggs, nuts, seeds, dairy products and increase a small portion of each in your meal to get that additional energy.
3. Essential Fats is Must

- Breast milk fat constitutes around 50% of the calories. So, a nursing mother should include unsaturated fats, especially those foods that provide the much required essential fatty acids such as Docosahexaenoic acid (DHA) and Arachadonic acid (ARA).

- These fats play a major role in the overall development of the eye and brain of the baby. DHA is adequately present in tuna, salmon and mackerel whereas eggs, poultry and meat are a good source of ARA.
4. Essential Vitamins

- During breastfeeding, the requirement for various vitamins increases dramatically especially vitamins such as C, A and all the vitamins from the B group including B12 and folate.

- That is why; it is essential that the diet for nursing mothers should be rich with nutrients, especially vitamins that are soluble in water such as vitamin C and B.

- Eating a wide variety of wholesome food helps to increase the nutrition level of the breast milk.
5. Major Minerals

- **Breast milk** should have various minerals especially zinc and iodine in significant amount.

- That is why, a nursing mother should include seafood in abundance in her diet. Food that is a rich source of zinc and iodine include eggs, poultry, milk, meat, seaweed and beans, nuts.
Calcium is one of the most important components of the milk and hence its requirement is higher in nursing women.

Apart from everyday serving of dairy including yogurt and milk, mother of an infant should also include other sources of calcium such as cheese, fish with edible bones, soybean, curd, legumes, calcium-fortified food and green leafy vegetables.
Precautions When not to breastfeed

There are some important reasons not to breastfeed:

1. Alcohol

   - Alcohol concentration peaks within one hour after ingestion of even moderate amounts
   - May alter the taste of the milk to the disapproval of the nursing infant
   - May drink less milk than normal

   - Drug addicts, including alcohol abusers, can take such high doses that their infants become addicts by way of breast milk
   - In these cases, breastfeeding is contraindicated
2. Cigarette smoking

• Lactating women who smoke produce less milk, with a lower fat content

• Thus, their infants gain less weight than the infants of nonsmokers

• A lactating woman who smokes transfers nicotine and other chemicals to her infant via her breast milk

• And exposes the infant to secondhand smoke

• Infants who are “smoked over” experience a wide array of health problems
  - Poor growth
  - Vomiting
  - Unexplained death
  - Hearing impairment
  - Breathing difficulties
  - Unexplained death
3. Caffeine

- Excess caffeine can make an infant jittery and wakeful.
- It can make baby wide-eyed, alert, active, doesn't sleep well and may also make him fussy.
- Caffeine consumption should be moderate when breastfeeding.

*Nursing mothers should avoid excessive use of caffeine.*
4. Medication

- If a nursing mother must take medication known to affect the infant
- Then breastfeeding must be put off during treatment
  - Meanwhile, the flow of milk can be sustained by pumping the breasts and discarding the milk
- Oral contraceptives
  - One type that combines the hormones estrogen and progestin seems to
    - Suppress milk output
    - Lower the nitrogen content of the milk
    - Shorten the duration of breastfeeding
5. Environmental Contaminants

- Some contaminants do enter breast milk
  - Others may be filtered out
- Formula is made with water
  - Formula-fed infants consume any contaminants that may be in the water supply
- With the exception of rare, massive exposure to a contaminant
  - The many benefits of breastfeeding outweigh the risk associated with environmental hazards in the U.S.
6. Maternal illness

- If a woman has an ordinary cold, she can continue nursing without worry.
- The infant will probably catch it from her anyway.
  - Thanks to immunological protection, a breastfed baby may be less susceptible than a formula-fed baby.
- With appropriate treatment, a woman who has an infectious disease such as hepatitis or tuberculosis can breastfeed.
- Transmission is rare.
7. HIV

- Can be passed from an infected mother to her infant during pregnancy, at birth, or through breast milk
- Especially during the early months of breastfeeding
- When safe alternatives are available, women who have tested positive for HIV should not breastfeed their infants
- In developed countries, where feeding inappropriate or contaminated formulas causes 1.5 million infant deaths each year, breastfeeding can be critical to infant survival
- This advantage must be weighed against the 200,000 - 300,000 infants who become infected with HIV each year by way of breastfeeding
Food to Avoid during breastfeeding

- The **diet for nursing mothers** should include variety of foods, but it should be clean and safe so that the chances of infection or food poisoning are lowered.

- A nursing mother should avoid alcohol and smoking as it affects the ability of the baby to suckle making him less alert.

- Avoid or restrict the use of caffeine to less than 200mg a day or it may cause restlessness in the baby.
- Do not eat large fish such as tilefish, swordfish or shark as they are dense in dioxins, mercury, polychlorinated biphenyls that can affect the growth of your baby’s nervous system.

- Strongly flavored foods such as onion and garlic too should be avoided, as some baby’s can be sensitive to its strong flavor.
1. Caffeine

- Caffeine that a mom drinks may end up in her breast milk and for an infant, it is harder for the small body to excrete the caffeine.
- Caffeine has been linked to jitters, irregular heart beat and insomnia.
- Note that caffeine is not just found in coffee, but also tea, energy drinks, soda and chocolate.
- Limit to no more than 200mg of caffeine a day, which is about two cups of coffee.
2. Alcohol

- Alcohol has been studied to affect sleep (drowsiness and weakness in the baby without proper sleep), abnormal weight gain and lower milk consumption in babies. It is best to avoid alcohol completely.

3. Pesticides

- While no one seek out pesticide to consume, it is present in fruits and vegetables.
- Given that organic foods are more expensive, it is wise to go organic for those fruits and vegetables that have the highest amount of pesticides.
4. Mercury

- Similar to pesticide, we do not look for mercury to consume but it is present in fish, a popular source of protein in Asia.

- Avoid fish that have higher levels of mercury such as shark, swordfish, king mackerel, solid white or albacore tuna and tilefish.

5. Raw foods

- As a precaution, it may be a good idea to limit consumption of raw foods and unpasteurized dairy products as these carry a higher risk of bacterial contamination such as salmonella, E. coli and listeria.
6. Junk foods

- This is to be avoided for everyone as processed foods with high sugar and sodium content have been linked to many chronic diseases.
- Consuming excessive junk foods may lead to consuming less nutritious foods, something which both the mother and baby needs.

7. Common Food Allergens

- It is not a recommendation by pediatric association to avoid common food allergens; however, mothers who have an allergic condition tend to play safe by avoiding them.
- Common foods that infants are allergic to are cow’s milk, eggs, wheat, soy, shellfish and peanuts.
A point to note is that the foods that the mother is allergic to does not mean that the baby will have the same food allergy.

8. Common Fussy Foods

Though not clinically proven, there are certain foods that seem to fall under the culprit of causing stomach upset and gas.

Observe your baby for any such sign and see if it happens after your consumption of foods such as citrus fruits, broccoli, peppers, cabbage and Brussels sprouts.
9. Spice

- This really varies from baby to baby as to which spice and how strong is palatable to a baby.
- If you observe that your baby does not like the milk after a spicy meal, you may want to cut down on spice including garlic.

10. Herbs

- The research is not conclusive but just as certain herbs seem to increase breast milk supply, herbs like peppermint, sage and parsley have been associated with reduced milk supply.
Foods that Boost your Breast milk Supply

- One of the best ways to increase milk supply is to keep on nursing your little one.
- Making milk from your baby is better than any other method to make milk in your body.
- The stimulations of the nerves during breastfeeding helps produce more milk in the breasts.
- The emptying of the milk signals your body to increase the milk production. If you feel your milk supply stills needs an improvement, then you should consider adding foods that promote milk production.
- Milk stimulating foods are called “galactagogues”
Galactagogues are foods, herbs, or drugs that may increase a mother's milk supply. They shouldn't be the first choice when trying to increase milk supply. First, you need to figure out if you truly have a low supply and try to fix anything that might be causing it (like latch issues, scheduled feedings, overuse of a bottle or pacifier, etc.). You should talk to a lactation consultant, herbalist, or doctor before starting a galactagogue, as some may not be safe for you.

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<table>
<thead>
<tr>
<th>Alfalfa</th>
<th>Cumin &amp; Caraway Seeds</th>
<th>Malunggay Leaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almonds (including almond milk and meal/flower)</td>
<td>Dandelion</td>
<td>Marjoram</td>
</tr>
<tr>
<td>Anise Seed</td>
<td>Dark Beer</td>
<td>Marshmallow Root</td>
</tr>
<tr>
<td>Barley-Grass &amp; Water</td>
<td>Dark Green leafy veggies</td>
<td>Natural Herbal Root-beers</td>
</tr>
<tr>
<td>Basil</td>
<td>Dill</td>
<td>Nettle</td>
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<tr>
<td>Beet</td>
<td>Domperidone</td>
<td>Oatstraw</td>
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<tr>
<td>Blessed Thistle</td>
<td>Fennel Seed</td>
<td>Raspberry Leaf</td>
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<td>Borage</td>
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<td>Reglan</td>
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<td>Brewer's Yeast</td>
<td>Garlic</td>
<td>Rivella</td>
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<tr>
<td>Caraway</td>
<td>Ginger and ginger ale</td>
<td>Rolled Oats</td>
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<tr>
<td>Carrot</td>
<td>Goat's Rue</td>
<td>Shatavari</td>
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<tr>
<td>Chamomile Pot Marigold</td>
<td>Go-Lacta</td>
<td>Spirulina</td>
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<tr>
<td>Coconut water (gatorade and powerade also work)</td>
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<td>SteelCut Oats</td>
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<tr>
<td>Commercial Lactation Teas</td>
<td>Healthy Oils and fats</td>
<td>Sulpiride</td>
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<td></td>
<td>Legumes</td>
<td>Vervain</td>
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<tr>
<td></td>
<td>Lemon balm</td>
<td>Yam</td>
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</tbody>
</table>
Top 25 Foods To Increase Breast Milk:

1. Oatmeal:
   - Oats are easy to prepare as a meal.
   - They are considered to control the occurrence of diabetes during post pregnancy.
   - Oatmeal is loaded with energy.
   - It contains fiber and is good for your digestion.
   - Have a bowl of oatmeal for breakfast. If the thought of having oatmeal is not appetizing, you can try having oat cookies instead.
2. Salmon:

- Salmon is a great source of EFA (Essential Fatty acids) and Omega-3.
- Both EFA and Omega-3 are highly nutritious and essential for lactating mothers.
- Including salmon in your menu boosts lactation hormones and make your milk more nutritious.
- Opt for steamed, boiled or even grilled salmon.
3. Spinach And Beet Leaves:

- Spinach and beet leaves contain iron, calcium and folic acid.
- These are essential for recouping anemic mothers.
- These will help in making your baby strong.
- Spinach and beet leaves contain detoxifying agents.
- Spinach contains certain plant chemicals which could help prevent breast cancer.
- Remember to eat spinach in moderation as too much could cause diarrhea in your baby.
4. Carrots:
- A glass of carrot juice with breakfast or lunch will work wonders in lactation.
- Like spinach, carrots too have lactation promoting qualities.
- It contains Vitamin A which complements lactation and boosts the quality of your milk.

5. Fennel Seeds:
- Fennel seeds boost the quantity of your breast milk.
- They are digestives and help control baby-colic.
6. Fenugreek Seeds:
- Fenugreek seeds are known for boosting breast milk supply.
- Chew on the sprouted seeds along with a glass of milk to prevent post-delivery constipation.
- It enhances your milk quantity.

7. Bottle Gourd:
- It is a summer vegetable which has high water content. This keeps a nursing mother hydrated.
- It also helps increase milk quantity.
- It is easy to digest and aids in lactation.
8. Basil Leaves:

- Basil leaves are a great source of anti-oxidants.
- Basil leaves have a calming effect which is important while lactating.
- It boosts your little one’s immunity levels

9. Garlic:

- Garlic is considered the best food to increase breast milk, as it is well-known for boosting lactation in nursing mothers.
- It has chemical compounds which help in lactation.
- Garlic consumption prevents all types of cancer.
10. Barley:
- Barley not only boosts lactation, it also keeps you hydrated.
- You can boil barley and have the water through the day.

11. Chickpea:
- Chickpea is a protein snack and lactation booster for nursing mommies.
- It is a rich source of calcium, B-complex vitamins and fibre.
12. Asparagus:

- Asparagus is considered a must-have food for nursing mothers.
- It is a high fibre food.
- It is also high in Vitamin A and K.
- It helps stimulate the hormones in nursing mothers that are essential for lactation.

13. Brown Rice:

- Brown rice gives nursing moms the extra energy that is required post-delivery.
- It has certain chemicals that help normalize the mood swings and sleep pattern.
- It helps increase the appetite.
- It has hormone stimulants which boost lactation.
- Brown rice also helps maintain sugar levels in the blood.

14. Cumin Seeds:
- Cumin seeds boost milk supply.
- Make sure you have them in moderation though.
- These are appetizers and fat-burners.
- They help avoid digestive irritants like acidity.

15. Black Sesame Seeds:
- Black Sesame seeds are a rich source of calcium and believed to increase milk supply.
16. Oils And Fats:

- It is recommended to keep fats and oils in your diet to a minimum, post pregnancy.
- Do not avoid fat and oil in your post-delivery diet.
- These are an essential part of lactation. They assist in absorption of vitamins and minerals present in other foods you eat.
- They also aid in easy bowel movement.
- Opt for olive oil, rice bran oil or any heart healthy oil.
- These help in balancing the supply of healthy fat to your baby.
17. Apricots:

- During and post pregnancy, there are hormonal imbalance that takes place in your body. Dried apricots have certain chemicals which balance out the hormone levels in your body.
- Apricots are rich in calcium and fibre and help boost lactation.

18. Cow Milk:

- Cow’s Milk has calcium and EFA. It promotes lactation.
- Add at least 2 to 3 glasses of cow’s milk in your everyday diet.
19. Dill Leaves:
- Dill leaves are believed to boost milk supply.
- They have a high fibre content and Vitamin K. These helps to replenish the blood loss that happens during delivery.

20. Drumstick:
- Drumstick has high iron and calcium content.
- It is good for lactation.
- It boosts immunity and enhances your nervous system.
21. Poppy Seeds (Khuskhus):

- It is very important for nursing mothers to relax completely during lactation.
- Take caution to include it in a minimum quantity in your diet.
- Poppy seeds help relax your mind and body while nursing.

22. Water And Juices:

- Drinking water and juices is supposed to boost lactation. It increases the total milk volume per feed.
- It prevents you from dehydration and replaces fluid lost during lactation.
23. Almonds:

- Almonds are rich in Omega-3 and Vitamin E.
- Vitamin E helps heal itching caused by post pregnancy stretch marks.
- Omega-3 helps lactation boosting hormones to help produce more milk.

24. Sweet Potato:

- Sweet potato is a major source of potassium. It has energy producing carbohydrate which is needed to fight the fatigue.
- It also contains Vitamin C and B-complex and a muscle relaxant mineral that is magnesium.
25. Unripe Papayas:

- Unripe Papayas are part of the South Asian cuisine.
- Papaya has been used as a natural sedative, which may help you to relax and feed baby better.
Food for different age groups: “Foods for Infants or babies”
The term *infant* is typically applied to young children between the ages of 1 month and 12 months; however, definitions may vary between birth and 1 year of age, or even between birth and 2 years of age.

A **newborn** is an infant who is only hours, days, or up to a few weeks old.

In medical contexts, newborn refers to an infant in the first 28 days after birth; the term applies to premature infants, postmature infants, and full term infants.
Normal Growth: Weight

- Normal birth weight 3.5kg
- Regain birth weight by 2 weeks
- Expected gain
  - 200g per week for 1st 3 months
  - 150g per week for 2nd 3 months
  - 100g per week for 3rd 3 months
  - 50-75g per week for 4th 3 months
- NB standardisation of measurements
Normal Growth : Length

- Normal birth length 50cm
- Expected growth
  - 1\text{st} year 25cm
  - 2\text{nd} year 12cm
  - 3\text{rd} year onwards 10-6cm per year until puberty
- Supine length until age 2
Normal Growth: OFC

- Occipital Frontal Circumference
- Normal head circ at birth 35cm
- >0.5cm per week (48cm by 1 yr)
- Reflects brain growth
- Above eyes, upright, looking straight ahead
Centile Charts

- Various charts available
- Calculate age in weeks
- Weight at 4-8 weeks predictive
- View growth in relation to normal population
## Reference Nutrient Intakes

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<th>Age (months)</th>
<th>Weight (kg)</th>
<th>Fluid (mls)</th>
<th>Energy (kcals/kg)</th>
<th>Protein (g/kg)</th>
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<td>150</td>
<td>115 – 110</td>
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<td>10 – 12</td>
<td>10.0</td>
<td>110</td>
<td>95</td>
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WHO RECOMMENDATION

- Exclusively Breastfeed for 6 months
- Continue to breastfeed after that, in combination with appropriate complementary foods, until the age of 2 years or beyond
- WHO guidelines have been accepted and endorsed by the DOHC
Breast milk

- Breastmilk is the best source of nutrients for infant to meet his needs for growth and development.

- It contains many valuable ingredients, such as antibodies, living immune cells and enzymes.

- It helps baby to build up immunity, and reduce the chances of having diarrhea, chest infection and hospital admissions.

- It contains substances, which cannot be obtained from infant formula, that help both the digestion and absorption of nutrients.
<table>
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<tr>
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<th>Human milk</th>
<th>Animal milks</th>
<th>Infant formula</th>
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<tbody>
<tr>
<td><strong>Protein</strong></td>
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<td>too much, difficult to digest</td>
<td>partly corrected</td>
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<tr>
<td><strong>Fat</strong></td>
<td>enough essential fatty acids, lipase to digest</td>
<td>lacks essential fatty acids, no lipase</td>
<td>no lipase</td>
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<tr>
<td><strong>Water</strong></td>
<td>enough</td>
<td>extra needed</td>
<td>may need extra extra</td>
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<tr>
<td><strong>Anti-infective properties</strong></td>
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Types and Composition of Human Breast Milk

Types of Breast Milk:
- Colostrum or Early Milk
- Transitional Milk
- Mature Milk

Colostrum or Early Milk is produced in the late stage of pregnancy till 4 days after delivery; and is rich in antibodies.

Transitional Milk produced from day 4 – 10 is lower in protein in comparison to Colostrum.

Mature milk is produced from approximately ten days after delivery up until the termination of the breastfeeding.
COLOSTRUM

- During the first two or three days after delivery thick and yellowish fluid is secreted from the mammary gland.
- This differs from the regular milk and is called colostrum.
- It is secreted in small quantity of about 10-40 ml.
- It is rich in protein.
- The total fat content of colostrum is less than mature milk.
- Concentration of arachidonic acid and docosa hexaenoic acid (DHA) as percent of total fatty acids is higher in colostrum than mature milk.
TRANSITION MILK

- During the next two weeks, the milk increases in quantity and changes in appearance and composition is called transition milk.
- The immunoglobin and protein content decreases while the fat and sugar content increases.
- Exclusive breast feeding of colostrum and transition milk minimizes infection related to neonatal death.
- The composition of milk changes even during the length of a single feed to exactly suit the need of a particular baby.
Mature milk

- Mature milk is produced from approximately ten days after delivery up until the termination of the breastfeeding.

- **FOREMILK-** The milk that comes at the start of a feed is called foremilk. Foremilk which is watery has a low level of fat and is high in lactose sugar, protein, vitamins, minerals and water. It satisfies the baby thirst.

- **HIND MILK:** Hind milk which comes later in a feed is richer in fat, it satisfies the baby’s hunger and supplies more energy than foremilk. Babies who are fed fore and hind milk sleep well and grow healthy.
ForeMilk

HindMilk

Fore milk

Hind milk

Fat (lipid)
Nutritional Importance of breast milk

- Protein
  - Protein in breast milk is mostly whey, which is easier to digest than casein (main protein in cow’s milk).
  - Protein of breast milk has high amounts of amino acid taurine, which has an important role in the development of the brain and the eyes.
# Breast Milk vs Cow and Infant Formula Composition

<table>
<thead>
<tr>
<th>Content per liter</th>
<th>Human</th>
<th>Cow</th>
<th>Preterm</th>
<th>Conv.</th>
<th>Milk-free</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kcal)</td>
<td>690</td>
<td>660</td>
<td>676</td>
<td>676</td>
<td>676</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>9</td>
<td>35</td>
<td>20</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>Taurine (mg)</td>
<td>80-40</td>
<td>1</td>
<td>48-57</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Fat (g)</td>
<td>45</td>
<td>37</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>68</td>
<td>49</td>
<td>74</td>
<td>79</td>
<td>75</td>
</tr>
<tr>
<td>Lactose</td>
<td>68</td>
<td>49</td>
<td>30</td>
<td>55</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Whey/Casein ratio of 80/20 – 60/40**
- **Whey/Casein ratio of 20/80**
Fats
- Fat in breast milk are practically self-digesting, since breast milk also contains the enzyme lipase, which breaks down the fat.
- Fat is the main source of calories for babies – and babies need lots of calories to grow well.
- Fat in human milk has large amounts of certain omega-3 fatty acids, which are important for brain development (provided the mother eats those good omega-3 fats herself).

Carbohydrate - Include lactose and oligosaccharides.

Leukocytes - Include neutrophils, macrophages, lymphocytes.
- Vitamins and minerals
  - Vit. and minerals in human milk are bioavailable—meaning they get absorbed well.
  - Breast milk contains substances that enhance the absorption of minerals and vitamins.

- Immune boosters
  - In each feeding mother deliver millions of living white blood cells to her baby to help baby fight off all kinds of diseases.
  - Also, when mother is exposed to a germ, she makes antibodies to that germ and gives these antibodies to her infant via her milk.
- Breast milk also contains factors that prevent microbes from attaching, and a long list of other antiviral, antibacterial and antiparasitic factors.

- **Hormones and enzymes**
  - Breast milk has lots of digestive enzymes, and also many hormones.
  - These all contribute to the baby’s well being.
Composition of breast milk vs cows milk

- Human milk compared to cow milk highlights differences in fat, protein, lactose, casein, and anti-infective proteins.
- Human milk contains more lactose and fewer caseins, making it easier to digest for humans.
- Cow milk has higher casein content and anti-infective proteins, making it more difficult to digest.

Key differences:
- **Human Milk**:
  - Higher lactose content.
  - Lower casein content.
  - Easy to digest.
- **Cow Milk**:
  - Higher casein content.
  - Anti-infective proteins.
  - Difficult to digest.
Differences in the Fats of Different Milks

**HUMAN**
- Contains Essential Fatty Acids, Enzyme Lipase

**COW'S**
- Contains No Essential Fatty Acids, No Enzyme Lipase
Vitamins & Iron

HUMAN
- B vitamins
- Vit. C
- Vit. A

COW'S

HUMAN
- B vitamins
- Vit. C
- Vit. A

50 - 70 μg/100ml

50 absorb
10

COW'S
- B vitamins

50 - 70 μg/100ml
Benefits of Breastfeeding

TABLE 15-4 Benefits of Breastfeeding

For Infants:
- Provides the appropriate composition and balance of nutrients with high bioavailability.
- Provides hormones that promote physiological development.
- Improves cognitive development.
- Protects against a variety of infections.
- May protect against some chronic diseases, such as diabetes (type 1) and hypertension, later in life.
- Protects against food allergies.

For Mothers:
-Contracts the uterus.
- Delays the return of regular ovulation, thus lengthening birth intervals. (It is not, however, a dependable method of contraception.)
- Conserves iron stores (by prolonging amenorrhea).
- May protect against breast and ovarian cancer.
Benefits of Breastfeeding

Other:

- Cost savings from not needing medical treatment for childhood illnesses or time off work to care for them.

- Cost savings from not needing to purchase formula (even after adjusting for added foods in the diet of a lactating mother).\(^a\)

- Environmental savings to society from not needing to manufacture, package, and ship formula and dispose of the packaging.

\(^a\)A nursing mother produces over 35 gallons of milk during the first six months, saving her roughly $450 in formula costs.
| Table 15-5 | Ten Steps to Successful Breastfeeding |

To promote breastfeeding, every maternity facility should:

- Develop a written breastfeeding policy that is routinely communicated to all health care staff.
- Train all health care staff in the skills necessary to implement the breastfeeding policy.
- Inform all pregnant women about the benefits and management of breastfeeding.
- Help mothers initiate breastfeeding within $\frac{1}{2}$ hour of birth.
- Show mothers how to breastfeed and how to maintain lactation, even if they need to be separated from their infants.
- Give newborn infants no food or drink other than breast milk, unless medically indicated.
- Practice rooming-in, allowing mothers and infants to remain together 24 hours a day.
- Encourage breastfeeding on demand.
- Give no artificial nipples or pacifiers to breastfeeding infants.\(^a\)
- Foster the establishment of breastfeeding support groups and refer mothers to them at discharge from the facility.


Formula feeding

- **Infant formula** is a manufactured food designed and marketed for feeding to babies and infants under 12 months of age, usually prepared for bottle-feeding or cup-feeding from powder (mixed with water) or liquid (with or without additional water).

- The composition of infant formula is designed to be roughly based on a human mother's milk at approximately one to three months postpartum, although there are significant differences in the nutrient content of these products.
The most commonly used infant formulas contain purified cow's milk whey and casein as a protein source, a blend of vegetable oils as a fat source, lactose as a carbohydrate source, a vitamin-mineral mix, and other ingredients depending on the manufacturer.

3 Forms:

- Powder - requires mixing with water.
- Concentrate - requires mixing with water in equal parts.
- Ready to feed - most expensive, does not require water.
# Formula Form and Function

<table>
<thead>
<tr>
<th></th>
<th>What It Is</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Powder</strong></td>
<td>The powder is mixed with water according to the package or doctor's instructions.</td>
<td>- Cheapest</td>
<td>- Not sterile, in some cases a doctor may instruct the use of Ready To Feed formula for the first few months home</td>
</tr>
<tr>
<td><strong>Liquid Concentrate</strong></td>
<td>The liquid, usually in a can, is mixed with water according to package or doctor's instructions.</td>
<td>- Easier to mix than powder</td>
<td>- More expensive than powder</td>
</tr>
<tr>
<td><strong>Ready To Feed</strong></td>
<td>The liquid in the package is ready for feeding.</td>
<td>- No mixing required, most convenient</td>
<td>- Most expensive</td>
</tr>
</tbody>
</table>
The different types of infant formula

1. **Cow’s Milk Based Formulas:**
   - Cow’s milk based formula is what the majority of formula fed babies consume.
   - Cow’s milk is adapted and made as close to breast milk as possible.
   - Subtle differences exist between some cow’s milk based formulas on the market.
     - For example, protein content may vary from predominantly casein to predominantly whey to 100% whey.
     - Some formula brands may also offer partially hydrolyzed (broken down) proteins or reduced lactose formulas.
2. **Soy Formulas:**
   - Instead of cow’s milk, soy is the protein in these formulas.
   - Soy formulas are not recommended for preemies due to risk of osteopenia (brittle bones).
   - There is a significant risk of cross reaction to soy formula in babies that are allergic to cow’s milk protein.
   - Soy formulas may be an option for babies who require a strict lactose free diet and for vegetarian families.

3. **Hydrolyzed Formulas:**
   - Hydrolyzed formulas are for babies with allergies to cows milk proteins (casein and/or whey).
- The proteins are extensively hydrolyzed (broken down) into short chain peptides and free amino acids.

4. **Elemental Formulas:**
   - In these formulas (also called amino acid based formulas), free amino acids serve as the protein content.
   - These formulas, although exhorbitantly priced, are helpful to babies who have reactions to the other formula options.

5. **Specialized Formulas:**
   - Certain health conditions, such as metabolic disorders, heart disease, severe reflux, or a premature birth, may require the use of a specialized formula recommended by a doctor.
Preparation of MaxiCare Complete Nutritional Care Formula

1. Wash hands before preparing the feed. Sterilise all utensils by boiling or using an approved steriliser.

2. Boil safe drinking water & allow to cool. Measure the required volume of cooled boiled water into a sterilised feeding bottle. Warm to feeding temperature.

3. Use only the enclosed scoop. Fill scoop lightly; level off using built-in leveller. Avoid compacting powder.

4. Always add one level scoop of powder for each 50mL of water. Cap the bottle & shake briskly to dissolve the powder.

5. Test temperature on wrist before feeding. Feed immediately (do not store). Discard unfinished feeds.
Why some mothers choose formula vs. breast milk

- Distressed by physical discomfort of early breastfeeding problems.
- Convenience issues
- Pressures of employment/school
- Worries that breast shape will change
- Formula manufacturers manipulate people through their ads
- Doctors and nurses need more lactation training
- Moms given very little time to adjust to changes of postpartum
- Family demands
- Non-supportive family/health professionals
- Embarrassment
- Lack of confidence in self
- Feeling that one cannot produce enough milk
Standard Infant Formula

- Standard infant formula have cow’s milk as a base.
- In making infant formula first remove the milk fat and replace it with vegetable oil.
- Fortified with all essential vitamins and minerals.
- Available with or without added iron.
- Several brands of infant formula now contain three fatty acids that are prevalent in human milk: arachidonic acid (ARA), eicosapentaenoic (EPA) acid and docosahexaenoic acid (DHA).
- Studies show that supplemental ARA & EPA may benefit infant’s visual function and cognitive development.
How can I be sure the formula is safe for my baby?

- Never buy an opened, dented, or bloated container of formula.
- Check the “Use By” date on the formula BEFORE you purchase it. The FDA requires every formula container to have one. Formula is nutritionally complete before the “Use By” date. It may start to break down after the use by date.
- Use boiled (and cooled) or sterile water to prepare a baby’s bottle. Most bottled water is not sterile and must be boiled like tap water.
- Mix the formula according to the package or doctor’s instructions. Too much or too little water can make a baby sick.
Use proper food safety and good sanitation practices when preparing a baby’s bottle. Wash hands, sterilize bottles, and clean all contact surfaces well. Don’t forget to clean the lid of an unopened formula can with soap and water before opening it.

Powdered formula that has been mixed and not fed to an infant is safe for up to twenty four hours if kept properly refrigerated.

Ready to feed formula can be safely refrigerated up to forty eight hours if not served to an infant. Any formula serving that has been fed to an infant must be discarded after an hour.
Some other advantages of formula feeding includes:

- Formula feeding gives the mother greater flexibility with her schedule. The father and other caretakers can easily step in, give a bottle, and establish their own bonding routines.

- It is easy to tell how much the baby is getting.

- Babies digest formula slower than breast milk. As a result, formula-fed babies typically go longer between feedings during the day and especially the night.

- Convenience.

- Flexibility.

- Because formula is less digestible than breast milk, formula-fed babies usually need to eat less often than do breastfed babies.
RISKS OF ARTIFICIAL FEEDING

- Interferes with bonding.
- More diarrhoea & respiratory infections.
- Malnutrition; vitamin A deficiency.
- Mother may become pregnant sooner.
- More allergy & milk intolerance.
- Increased risk of chronic diseases.
- Over feeding may take place.
- Lower scores on intelligence scale.
- Increased risk of anaemia, ovarian cancer & breast cancer.
Making a Choice: Breastfeeding Vs. Formula Feeding

- It is not at all easy to decide how will you feed your little one.

- Some women may choose one method before the delivery and then change later after the birth. And some women choose to both breastfeed and formula feed according to their comfort and lifestyle.

- It is, therefore, better to check with a health care provider as they can give you the right options and help you with the best decision.

- Both breastfeeding and formula feeding has their own perks, and the basic idea is to keep your kid well fed and ‘healthy.’
Making a Choice: Breastfeeding Vs. Formula Feeding

- It is best to stick with breastfeeding for at least 6 initial months of your baby’s life, and then move on to formula feeding if you find it difficult or inconvenient to breastfeed.

- Trying to balance breastfeeding with formula feeding is a good trick – You can breastfeed in the comfort of your home and carry formula milk for when you’re travelling or outdoors!
WHO/UNICEF Feeding Recommendations

- Exclusive breastfeeding for first six months
- Continued breastfeeding for two years or more
- Safe, appropriate and adequate complementary foods beginning at 6 months
- Frequency of complementary feeding: 2 times per day for 6-8 month olds; 3 times per day for 9-11 month olds
Complementary Foods - definitions

- “Any energy-containing foods that displace breastfeeding and reduce the intake of breast milk.” (American Academy of Pediatrics, AAP)

- “Any nutrient containing foods or liquids other than breastmilk given to young children during the periods of complementary feeding....[when] other foods or liquids are provided along with breastmilk.” (WHO)

- “any foods or liquids other than human milk or formula that are fed during the first 12 months of life.” (Healthy Start Guidelines)

- Growth, nutritional, and developmental factors form the basis of feeding transitions and recommendations for complementary foods.
When breast milk is no longer enough to meet the nutritional needs of the infant, complementary foods should be added to the diet of the child.

The transition from exclusive breastfeeding to family foods, referred to as complementary feeding, typically covers the period from 6 to 18-24 months of age, and is a very vulnerable period.

It is the time when malnutrition starts in many infants, contributing significantly to the high prevalence of malnutrition in children under five years of age world-wide.
Complementary feeding should be *timely*, meaning that all infants should start receiving foods in addition to breast milk from 6 months onwards.

It should be *adequate*, meaning that the complementary foods should be given in amounts, frequency, consistency and using a variety of foods to cover the nutritional needs of the growing child while maintaining breastfeeding.
When to feed baby complementary food

- **Before four months old**, the digestive system of the infant is very delicate and the body's digestive enzyme is not fully functional yet.

- Hence, **when baby is less than 4 months old**, all nutrition that baby needs must either come from breast milk or formula milk powder.

- **After four to six months**, nutrition in the breast milk or milk powder may not be able to support baby's growing need, supplementary food then becomes very necessary. Supplementary food also helps to prepare baby for future weaning.
Four months is not a fixed timing. Parents should observe the behavior of the baby in order to get a precise timing of when to feed baby supplementary food.

If your baby's weight stops increasing or he looks hungry even after milk feeding, or he is very interested in the other food on your dinner table; or he is able to grasp other food and feed himself; all these indicate that it is time to give baby supplementary food.

Please also take note that if your baby experiences constipation, bloating, diarrhea after you feed him one supplementary food. You should then consider delay feeding him that supplementary food or change to other supplementary food.
Some Considerations in Complementary feedings

<table>
<thead>
<tr>
<th>Too Early</th>
<th>Too Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>diarrheal disease &amp; risk of dehydration</td>
<td>potential growth failure</td>
</tr>
<tr>
<td>decreased breast-milk production</td>
<td>iron deficiency</td>
</tr>
<tr>
<td>Allergic sensitization?</td>
<td>developmental concerns</td>
</tr>
<tr>
<td>developmental concerns</td>
<td></td>
</tr>
</tbody>
</table>
Nutritional Concerns

- Just like adults, babies who are eating solid foods should eat nutritious, well-balanced meals.
  - They should be able to eat when they are hungry; rather than on a rigid schedule.

- Babies have very specific nutritional needs:
  - Enough calories to provide for activity and rapid growth
  - Foods that provide key nutrients, such as vitamins and minerals
  - Adequate amounts of liquids
Malnutrition in infancy can cause lasting physical problems.

- **Malnutrition**: is inadequate nutrition.
  - Linked to poor brain development and can lead to learning difficulties
An allergy is an oversensitivity to a particular common substance that is harmless to most people.

- When a person has an allergy, the body’s immune system attacks the substance.

The reaction may be mild as puffy, itchy eyes or as severe as anaphylactic shock - a life threatening condition which makes it hard to breath.

It is important to watch for signs of allergies in babies.

- Signs of a food allergy: excessive crying, vomiting or 8 or more watery stools a day.

Babies SHOULD NOT eat eggs, citrus fruits, honey, peanut butter, corn, shellfish during their first year. All of which are common allergy foods.
**Recommended breastfeeding and solid feeding introduction for infants**

<table>
<thead>
<tr>
<th>Birth</th>
<th>Breastfeeding</th>
<th>Solid foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding</td>
<td>Introduction of solids</td>
<td>Introduction of cow’s milk</td>
</tr>
<tr>
<td>6 months</td>
<td>Breastfeeding</td>
<td>Solid foods</td>
</tr>
<tr>
<td>12 months</td>
<td>Breastfeeding</td>
<td>Solid foods</td>
</tr>
</tbody>
</table>

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[^17]: 
[^40]:
<table>
<thead>
<tr>
<th>When Child can:</th>
<th>Texture</th>
<th>Description</th>
<th>Serve:</th>
<th>Estimated Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suck and swallow.</td>
<td>Thin puree</td>
<td>Use strainer/ blender and blend to a paste (add liquid for thinner consistency).</td>
<td>Infant cereal, strained meat, pureed vegetables and fruits.</td>
<td>6 months onwards (breastfeed exclusively up to 6 months, unless special cases).</td>
</tr>
<tr>
<td>Able to take food from spoon with lips.</td>
<td>Thick puree</td>
<td>Food forms a thicker consistency or heavy mash (without lumps).</td>
<td>Blended meats, pureed vegetables and fruits.</td>
<td>6 months onwards.</td>
</tr>
<tr>
<td>Swallow thickened puree and not gag.</td>
<td>Mashed</td>
<td>Food is blended or mashed with a fork (still retains some texture and consistency).</td>
<td>Mashed potatoes, carrots, sweet potatoes, pumpkin, bananas and other soft fruits such as papaya, mango, egg yolk.</td>
<td>6 to 7 months onwards.</td>
</tr>
<tr>
<td>Swallow without gagging.</td>
<td>Ground</td>
<td>Food ground in food chopper, not blender (should be easy to chew).</td>
<td>Crumbled or ground meat, scrambled eggs, pieces of soft bread, crackers broken into small pieces.</td>
<td>8 months onwards.</td>
</tr>
<tr>
<td>Close lips while swallowing food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remove food from spoon with lips.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up-and-down munching movement.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Begin to chew in rotary pattern.</td>
<td>Chopped</td>
<td>$\frac{1}{4}$ to $\frac{1}{2}$ inch in size.</td>
<td>Meat, vegetables and fruits.</td>
<td>10 to 11 months onwards.</td>
</tr>
<tr>
<td>Side-to-side tongue movement.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical and diagonal jaw movement, with enough strength to break up the food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close lips and keep food in mouth.</td>
<td>Regular size</td>
<td>Cut up food or leave it whole.</td>
<td>All foods.</td>
<td></td>
</tr>
<tr>
<td>Bite through food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough jaw strength to grind.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6 months
Start with mashed or pureed.

After 6 months
Gradually include coarse mash, grated, minced & finely chopped. Encourage soft finger foods that baby can hold & chew, such as rusks, soft vegetables & fruit.
9-12 months
Gradually include soft diced foods. Encourage finger foods.

12 months+
Finger foods. Family meals - variety of textures. Avoid foods that may cause choking e.g. nuts & lollies.
Cooking for Baby

- Baby food preparation
- Various purees and frozen blocks
- Recipes and ingredients

Green Beans, Peach, Peas, Apple, Sweet Potato, Strawberry, Peach, Banana
# Solid Food Chart by Food

## Fruits
- Apples: 4-6 months
- Avocados: 4-6 months
- Apricots: 6-8 months
- Bananas: 4-6 months
- Blueberries: 8-10 months
- Cantaloupe (Melons): 8-10 months
- Cherries: 8-10 months
- Citrus: 12 months
- Coconut: 8-10 months
- Cranberries: 8-10 months
- Figs: 8-10 months
- Grapes: 8-10 months
- Kiwi: 8-10 months
- Mango: 6-8 months
- Nectarines: 4-6 months
- Peaches: 4-6 months
- Papaya: 8-10 months
- Pears: 4-6 months
- Persimmons: 8-10 months
- Plums: 6-8 months
- Prunes: 6-8 months
- Pumpkin: 6-8 months
- Strawberries: 12 months

## Vegetables
- Asparagus: 8-10 months
- Broccoli: 8-10 months
- Beans (Dried/Lentils): 10-12 months
- Beets: 8-10 months
- Carrots: 6-8 months
- Cauliflower: 8-10 months
- Corn: 10-12 months
- Cucumber: 8-10 months
- Eggplant: 8-10 months
- Green Beans: 4-6 months
- Kale: 6-8 months
- Leeks: 8-10 months
- Onions: 8-10 months
- Parsnips: 6-8 months
- Peas: 6-8 months
- Peppers: 8-10 months
- Potato-White: 8-10 months
- Sweet Potato: 4-6 months
- Spinach: 10-12 months
- Squash-Butternut: 4-6 months
- Squash-Zucchini: 6-8 months
- Tomatoes: 12 months
- Turnip: 8-10 months

## Protein
- Beef: 8-10 months
- Chicken: 6-8 months
- Eggs: 8-10 months
- Fish: 10-12 months
- Pork: 8-10 months
- Tofu: 6-8 months
- Turkey: 6-8 months

## Dairy
- Cow Milk: 12 months
- Cheese: 8-10 months
- Cottage Cheese: 8-10 months
- Cream Cheese: 8-10 months
- Yogurt: 6-8 months

## Grains
- Barley: 4-6 months
- Buckwheat: 8-10 months
- Flax: 8-10 months
- Kamut: 8-10 months
- Millet: 8-10 months
- Oatmeal: 4-6 months
- Pasta: 8-10 months
- Quinoa: 8-10 months
- Rice: 4-6 months
# Starting Solids for the Asian Baby

**6 months**
- Lunch only
- Porridge (baby rice grains)
- Pumpkin
- Green vegetables (bayam, sawi, di huang miao)
- Potatoes
- Sweet potatoes
- Carrots

**7-8 months**
- Add teatime fruit snacks
- Fuji apple
- Packham pear
- Bananas (Berangan, Cavendish)
- Papaya
- Increase solids to lunch & dinner
- French beans
- Cauliflower

**9-10 months**
- Add breakfast
- Rolled oats
- Blueberries
- Ma yau fish / ikan kurau
- Grouper fish / ikan kerapu
- Celery

**11-12 months**
- Plain spaghetti
- Egg yolk
- Beta-agonist-free pork
- Salmon

*Chart is indicative – parents should use discretion to adapt to baby’s needs and preferences*
Infant Feeding Conclusion

1. During the first 6 months, your baby needs ONLY breast milk.
   - Breast milk provides all the food and water that your baby needs during the first 6 months.
   - Do not give anything else, not even water. Medicines can be given if they are recommended by health provider.
   - Breastfeed your baby on demand, day and night. Appropriate breastfeeding position helps you to produce a good supply of breast milk.
2. Starting Complementary Feeding when baby reaches 6 months.

- Continue breastfeeding your baby on demand both day and night.

- When giving complementary foods, think: Frequency (2 times a day), Amount (2-3 tsp. at each feed), Thickness (thick enough to be fed by hand), Variety (begin with the staple foods like porridge [corn, wheat, rice, millet, potatoes, sorghum], mashed banana or mashed potato), Responsive feeding (don’t force your baby to eat), and Hygiene.
3. Complementary feeding from 6 up to 9 months.
   - Continue breastfeeding your baby on demand both day and night. Breast milk supplies half (1/2) baby’s energy needs from 6 up to 12 months.
   - When giving complementary foods to your baby, think: Frequency (3 times a day), Amount (Increase amount gradually to half (½) cup (250 ml cup: show amount in cup brought by other), Thickness (Give mashed/pureed family foods).
   - By 8 months your baby can begin eating finger foods), Variety (Animal-source foods, staples, legumes and seeds, fruits and vegetables), Responsive feeding, and Hygiene
4. Complementary feeding from 9 up to 12 months.
   - Continue breastfeeding your baby on demand both day and night. When giving complementary foods to your baby, think: Frequency (4 times a day), Amount (Increase amount to half (½) cup), Thickness (Give finely chopped family foods, finger foods, sliced foods), Variety (Avoid giving sugary drinks, avoid sweet biscuits), Responsive feeding, and Hygiene.
5. Continue breastfeeding your baby on demand both day and night.
   - Breast milk continues to make up about one third (1/3) of the energy needs of the young child from 12 up to 24 months.
   - When giving complementary foods to your baby, think: Frequency (5 times a day), Amount (Increase amount to three-quarters (¾) to 1 cup), Thickness (Give family foods cut into small pieces, finger foods, sliced food), Variety, Responsive feeding, and Hygiene
Question:

1) What are the foods that promote milk supply?

2) If the mother does not take the breast milk to her infant, how is infant receives the nutrient?

3) What is the best food for at least six months of infant?

4) What are the importance of breast milk for infants? (two reason)

5) The importance of amino acid in breast milk is?