

INFANT & TODDLER FEEDING from Birth to 23 Months

Making Every Bite Count

The first two years of your child's life is important for proper growth and development. It is also critical for establishing healthy dietary patterns for later in life. You likely have many questions about this important life stage including: what do you feed a newborn infant?, when are infants ready for solid foods?, which foods should be given and when?, how much food is enough? or when is the right time to introduce potentially allergenic foods, such as peanuts?

This resource provides information on infant and toddler feeding from birth through twenty-three months of age, including information on breastfeeding, infant formula, the introduction of solid foods and infant safety while eating. Keep in mind that every infant is different, and their diets may vary depending on many factors such as age, stage of development and nutritional needs. Ask your pediatric nurse practitioner, pediatrician, registered dietitian or other healthcare provider for more specific feeding advice.

NEWBORNS

For about the first six months of life, infants should be exclusively fed human milk, which is also called breastfeeding.^{1,2} **Young infants are not ready for solid foods.** They are unable to safely swallow solid foods and their stomachs are not able to digest solids well. When possible, **breastfeeding should be continued through at least the first year of life while introducing complementary foods;** longer if desired.^{3,4} Iron-fortified infant formula is an option if a mother has trouble breastfeeding, or if human milk is unavailable or not compatible with the infant's specific needs. Infant formulas are designed to meet the nutritional needs of infants for the first year of life and are not recommended beyond age 12 months.

Human milk can support your infant's nutrient needs for about the first six months of life, except for vitamin D and potentially iron. It's generally recommended to provide infants exclusively fed human milk with supplemental vitamin D beginning soon after birth as there are limited dietary sources of vitamin D. While it is possible for the body to make vitamin D after sun exposure, it is not recommended for infants to be exposed to direct sunlight.^{1,5}

Vitamin D supplementation should be continued unless your infant is consuming at least one liter per day (about one quart per day) of vitamin D–fortified formula. Any infant who receives less than one liter or one quart of formula per day needs an alternative way to get 400 IU/day of vitamin D, as through **vitamin D supplementation.**⁵

An infant is typically born with adequate iron supply for about the first 6 months of life, depending on gestational age, maternal iron status and timing of umbilical cord clamping. **By age 6 months, however, infants exclusively fed human milk will require an external source of iron apart from human milk.**



Homemade Infant Formula

The FDA regulates commercially available infant formulas, which come in liquid and powder forms, but it does not regulate recipes for homemade formulas. **The FDA strongly advises parents and caregivers not to make and feed their infants homemade infant formulas,** as the potential problems with homemade formulas include contamination and absence of or inadequate amounts of critical nutrients. These problems are very serious, and the consequences can be life-threatening.⁶

Caregivers of infants exclusively fed human milk should talk with their pediatric care provider about whether there may be a need for supplementation with iron before age 6 months. A complementary food source of iron beginning at about 6 months is particularly important for infants fed human milk because the iron content of human milk is low and a mother's intake of iron during breastfeeding does not increase its content.¹

Proper Handling And Storage Of Human Milk And Infant Formula⁷

- Wash hands thoroughly before expressing human milk or preparing to feed human milk or infant formula.
- If expressing human milk, ensure pump parts are thoroughly cleaned before use.
- If preparing powdered infant formula, use a safe water source and follow instructions on the label.
- Refrigerate freshly expressed human milk within four hours for up to four days. Previously frozen and thawed human milk should be used within 24 hours. Thawed human milk should never be refrozen.
- Refrigerate prepared infant formula for up to 24 hours.
- Do not use a microwave to warm human milk or infant formula. Warm safely by placing the sealed container of human milk or infant formula into a bowl of warm water, or under warm, running tap water.
- Once it has been offered to the infant, use or discard leftovers quickly; within two hours for human milk or one hour for infant formula.
- Thoroughly wash all infant feeding items, including bottles and nipples. Consider sanitizing feeding items for infants younger than 3 months of age, infants born prematurely, or infants with a compromised immune system.

4 TO 6 MONTHS

Most experts recommend starting solid foods sometime between four and six months of age.⁸ These foods are called complementary foods. Remember, human milk or formula is still the most important food for your infant during the first year of life; at this age, solid (complementary) foods are necessary to ensure adequate nutrition and exposure to flavors, textures and different types of foods.¹ **Potentially allergenic foods, such as eggs, dairy, peanut, tree nuts, fish and shellfish, should be introduced with other complementary foods at this time.**^{9,10} It is important that your infant's first foods are mashed into small pieces to avoid potential choking hazards. Keep in mind it can take eight to fifteen times of trying a new food for an infant to accept it.

Iron rich foods, such as iron-fortified baby cereal or pureed meats, and zinc rich foods, such as meats,

beans and zinc-fortified infant cereals, are good first foods to introduce to infants 4 to 6 months of age. Infants exclusively fed human milk especially benefit from earlier introduction of iron- and zinc-rich foods. Honey should not be consumed by infants less than one year old.

Give one new food every three to five days and watch for any



unusual reactions. It is normal for an infant's stool to change color and/or consistency when eating new foods, however a skin rash, diarrhea or vomiting may be signs of a food allergy or intolerance. If you notice any of these symptoms, stop feeding the new food and tell your healthcare provider about the reaction as soon as possible; keep a diary of new foods introduced and any reactions.

At first, your infant may not like the taste of solid food. Don't be discouraged; you may first want to try giving the food after your infant has taken a little human milk or formula. This way, feeding solid foods will be associated with an enjoyable event, and your infant will eventually be eager to eat.

Encourage your child to consume a variety of foods from all food groups, except for **foods and beverages with added sugars and caffeine; foods and beverages higher in sodium should also be limited.**

For healthy infants with adequate intake of human milk or infant formula, supplemental water is typically not needed in the first six months. Small amounts of plain, fluoridated drinking water can be given to infants who are at least 6 months old as they learn to drink from a cup.¹¹



Infants may be ready to begin solids when:

- They are able to control their head and neck
- They are able to hold their head up by themselves
- They do not push food out of their mouth with their tongue
- They sit up alone or with support
- They try to grasp small objects, such as toys or food
- They swallow food rather than pushing it back out onto the chin



How to feed your infant:

- If giving cereal, mix one tablespoon of cereal with 4-5 tablespoons of human milk or formula.
- Use a small rubber coated spoon with a long handle to feed.
- Position your infant in a highchair sitting in front of you so you can see one another's faces.
- Place about ½ teaspoon of cereal or pureed food on the back of your infant's tongue; this will help them suck the food off the spoon.
- Start with small serving sizes – one to two small spoonfuls at a time.



What not to do during feedings:

- Do not put cereal in the bottle.
- Try not to feed your infant when you are in a hurry or distracted, or if he or she is too tired.
- Do not force food when your infant is showing signs of fullness. Infants are full when they turn their heads away from food or keep their mouth closed when food is offered.

Vitamin and Mineral Supplementation¹

Infants may need supplemental iron and vitamin D, even if they are growing well. Iron is needed to build red blood cells and supports neurological development and immune function. Though infants are born with stored iron, it is used up around six months of age; after that, an infant must receive iron either through supplementation or iron-rich foods. Vitamin D is another important nutrient, as it is needed to build strong bones. The 2020-2025 Dietary Guidelines for Americans recommends that infants exclusively fed human milk are also provided supplemental vitamin D beginning soon after birth. The American Academy of Pediatrics recommends that all infants receive these nutrients either from food or supplements. Check with your healthcare provider if you have questions about vitamin D and iron supplements during the first year.



Dietary Components to Limit¹

Avoid Added Sugars and Low-Calorie Sweeteners

The 2020-2025 Dietary Guidelines for Americans (DGA) do not recommend the consumption of low-calorie sweeteners or added sugars by children younger than 2 years of age. This recommendation is partly meant to help infants and toddlers avoid developing a preference for overly sweet foods during this formative phase. More specifically, infants and young children have virtually no room in their diet for added sugars. This is because the nutrient requirements for infants and young children are quite high relative to how small they are, and the amount of complementary foods they consume is small.

Avoid Foods Higher in Sodium

Sodium is found in several foods, including some salty snacks, commercial toddler foods and processed

meats. In addition to keeping sodium intake within limits for toddlers, another reason to avoid high-sodium foods is that taste preferences for salty food may be established early in life.

Avoid Honey and Unpasteurized Foods and Beverages

Infants should not be given any foods containing raw or cooked honey. Honey can contain the *Clostridium botulinum* organism that can cause serious illness or death among infants. Infants and young children also should not be given any unpasteurized foods or beverages; these include unpasteurized juices, milk, yogurt, or cheeses, as they could contain harmful bacteria.



Metals and Your Food

Metals, like other naturally occurring elements, enter our food supply through our air, water and soil. To help protect the safety of the food supply, the FDA monitors, tests, and sets standards for metals in foods. When the level of metals is determined to be unsafe, the FDA uses its authority to take action on a case-by-case basis.¹²

Unlike the potential for foods to be contaminated with naturally occurring metals, some foods such as breakfast cereals and infant formula are intentionally fortified with metals like iron that are beneficial to health.



Homemade Baby Food

You may choose to make homemade baby food for your infant; you may feed your infant raw, mashed bananas, but most other fruits and vegetables should be cooked until they are soft then mashed with a fork or blended with a food processor. Never add honey or corn syrup to homemade baby food, and do not add salt while cooking fresh foods for your infant. Always refrigerate leftover food, and look for signs of spoilage before giving the food to your infant. Fresh foods will spoil more quickly than food from a can or jar.¹³

6 TO 8 MONTHS

Continue to give human milk or formula as well as add thicker pureed fruits, vegetables, whole milk yogurt and meats to your infant's diet. Do not mix foods until your infant has had every food in the combination by itself. Zinc rich foods, such as meats, beans and zinc-fortified infant cereals are important from age six months to support adequate zinc status, which supports growth and immune function. Iron rich foods such as iron-fortified baby cereal or pureed meats are also essential. Between the ages of six to twelve months, infants may drink a small amount of water as they learn to drink from a cup.¹²

Food Allergies

Introducing potentially allergenic foods with other complementary foods can help prevent food allergies and optimize an infant's long-term health. The American Academy of Allergy, Asthma, and Immunology and the American Academy of Pediatrics recommend introducing common food allergens at around 6 months of age when other complementary foods are introduced; the [2020-2025 Dietary Guidelines for Americans](#) echoes this recommendation.^{1,9,10} Introducing peanuts at or around 6 months of age can help reduce the risk of developing a peanut allergy. Infants who are at increased risk for a peanut allergy – those with egg allergies, severe eczema, or both, should receive their first peanut-containing foods even earlier, between four and six months. Dairy in the form of plain whole milk yogurt can be introduced before a child's first birthday, however, cow's milk as a beverage, should wait to be introduced at 12 months old or later. It's always recommended to consult with your healthcare provider if you have any questions or concerns about when to introduce potential allergens to your infant.



8 TO 10 MONTHS

At this time, most infants are ready to eat more textured foods such as mashed and diced foods. **New foods, such as finger foods may be introduced.** Chop food into small bite size pieces. Ripe bananas, well cooked vegetables, and teething biscuits are all good choices. **Avoid giving foods that can cause your infant to choke;** uncooked vegetables or fruits (except bananas and avocados), chunks of cheese, whole grapes, peanuts, popcorn, and hot dog pieces should not be given. Poorly chewed food can block the airway and infants cannot cough or clear their throats well enough to remove the food.

Your infant may begin finger foods when able to:

- Sit up straight in a high chair
- Grasp food with hands or fingertips
- Move food from hands to mouth

10 TO 12 MONTHS

Your infant is becoming more independent and may be able to hold a spoon. Keep offering new foods; **it can take eight to fifteen attempts of trying a new food for an infant to accept it.** Even without all their teeth, infants can still use their gums and tongue to mash food with lumps. **Encourage responsive feeding** (see call out box) as much as possible. While you are feeding your infant, name the food and utensils being used, or colors of the food. Remember, each feeding is a special time for you to communicate together.

The National Association of Pediatric Nurse Practitioners and the American Academy of Pediatrics recommend breastfeeding until at least one year of age.^{2,4} Breastfeeding can be continued past this time if you and your infant choose to do so.

Plain, fluoridated drinking water intake can slowly be increased after age one to meet hydration and fluoride needs. Your infant should not consume cow's milk or fortified soy beverages before age 12 months.

Plant-based milk alternatives, which are sometimes referred to as milk alternatives, include beverages made from plants, such as soy, oat, rice, coconut, and almond. These beverages should not be used in the first year of life to replace human milk or infant formula. They may come in different flavors and some forms have added sugars. Unsweetened versions of these beverages may be accommodated in small amounts in the diet during the second year of life, but most have significantly less protein than cow's milk and are not always fortified with calcium and vitamin D. Among plant-based milk alternatives, only fortified soy beverage is currently considered a dairy equivalent. Thus, consuming other plant-based beverages does not contribute to meeting dairy recommendations.¹

Safety at the Plate

Follow these simple guidelines to help your infant stay safe while eating:

- Always supervise your infant while eating; choking often occurs when infants are given foods that they are not ready to eat.
- Cut foods into small pieces – 1/4 inch or smaller, and place only a few pieces on the plate at a time.
- Encourage your infant to take small bites and chew food completely.
- It is important that your infant sits down when eating; never let your infant eat while lying down or walking.

Responsive Feeding

Responsive feeding is a term used to describe a feeding style that emphasizes recognizing and responding to the hunger and fullness cues of an infant or young child. Responsive feeding helps young children learn how to self-regulate their intake.

Signs A Child Is Hungry Or Full

Birth Through Age 5 Months

A child may be hungry if he or she:

- Puts hands to mouth
- Turns head toward breast or bottle
- Puckers, smacks or licks lips
- Has clenched hands

A child may be full if he or she:

- Closes mouth
- Turns head away from breast
- Relaxes hands

Age 6 Through 23 Months

A child may be hungry if he or she:

- Reaches or points to food
- Opens his or her mouth when offered a spoon or food
- Gets excited when he or she sees food
- Uses hand motions or makes sounds to let you know he or she is still hungry

A child may be full if he or she:

- Pushes food away
- Closes his or her mouth when food is offered
- Turns his or her head away from food
- Uses hand motions or makes sounds to let you know he or she is still full

HOW MUCH SHOULD MY INFANT EAT?^{1,14}

These are typical portion sizes and daily intake for infants 6-12 months old.

| Age & Stage | Grains/Cereals | Fruits | Vegetables | Protein Foods | Portion Sizes |
|---|--|---|--|---|---|
| <p>6 months</p> <p>Start with pureed, strained, easy to swallow foods</p> <p>Add human milk, prepared formula or water for a thinner consistency</p> | <p>Iron fortified infant cereal</p> <p>Pureed barley, oatmeal, amaranth, quinoa cereal</p> | <p>Cooked, pureed single fruits such as peaches, apricots</p> <p>Mashed raw banana or avocado</p> | <p>Cooked, pureed single vegetable such as carrots, peas, green beans, squash, sweet potato</p> | <p>Pureed meats, fish, poultry, legumes, tofu</p> <p>Whole milk yogurt, with no added sugar</p> <p>Soft scrambled eggs, mashed slightly</p> <p>Peanut or nut butter, thinned</p> | <p>Start with 1-2 tbsp one to two times per day</p> <p>Work up to 2-4 tbsp two to three times per day</p> |
| <p>7-9 months</p> <p>Progress texture to lumpy, coarsely mashed or finely chopped foods</p> <p>Begin exploring self-feeding with soft, mushy finger foods</p> | <p>Lumpier oatmeal, iron fortified cereals</p> <p>Dry "O" type cereal</p> <p>Bits of soft whole grain bread</p> <p>Soft cooked pasta</p> | <p>Peeled mashed cooked fruits</p> <p>Continue to increase variety</p> <p>Start to mix foods infant has tried</p> | <p>Peeled mashed cooked veggies</p> <p>Continue to increase variety</p> <p>Start to mix foods infant has tried</p> | <p>Soft mashed meats, fish, poultry, legumes, tofu</p> <p>Whole milk yogurt, no added sugar</p> <p>Soft scrambled eggs</p> <p>Cottage cheese or other pasteurized soft cheeses</p> <p>Peanut or nut butter, thinned</p> | <p>2-4 tablespoons two to three times per day</p> |
| <p>8-12 months</p> <p>When ready, add more soft finger foods</p> <p>Infant can join family meals</p> <p>Begin introducing table foods/ combination foods with "smush" consistency</p> | <p>Whole grain no-added sugar cereal, puffs, pasta, brown rice, quinoa, whole grain tortilla</p> | <p>Small pieces of cooked or soft fruit, skins removed</p> | <p>Small pieces of cooked or soft veggies, skins removed</p> | <p>Small pieces of soft cooked meats, fish, tofu, legumes, egg and soft pasteurized cheese</p> <p>Whole milk yogurt, no added sugar</p> <p>Peanut or nut butter on soft bread</p> | <p>4-8 tablespoons three times per day</p> <p>Optional snack (2-4 tablespoons twice a day)</p> |



*Some foods to avoid that can be a choking hazard: chunks of meat or cheese, hot dogs, sausages, popcorn, seeds, nuts, chunks of peanut butter, whole grapes or cherry tomatoes, hard or sticky candy, chewing gum, raw vegetables or fruit chunks. No need to add salt or sugar. Honey should be avoided before 12 months.

CONSIDERATIONS FOR 12-23 MONTHS

Whole cow's milk – up to 16-24 ounces per day, should only be introduced after your infant turns one year old.¹⁵ Young infants cannot digest cow's milk as easily as human milk or formula. This is because cow's milk contains higher amounts of protein and some minerals. After age 12 months, the fat in whole milk is important for proper growth and development. Low-fat dairy should not be given until two years of age unless your healthcare provider recommends it. If your infant is put on a special formula for a milk allergy or intolerance, talk to your healthcare provider before introducing dairy.

After the age of twelve months, if you choose to give juice, it should only be **100% fruit juice**. Juice should not replace the amount of human milk or formula your child or toddler is drinking. Limit juice to no more than four ounces a day and offer it only with a meal or snack. If you offer juice, serve it in a cup, never in a bottle or sippy cup as this can lead to tooth decay.¹⁶

Sugar-sweetened beverages – regular soda, juice drinks that are less than 100% fruit juice, sports drinks, and flavored water with sugar, should not be given to children younger than age two. Drinks labeled as fruit drinks or fruit-flavored drinks may contain added sugars or low-calorie sweeteners and are not the same as 100% fruit juice.

There are no clear needs for special milks or drinks specifically marketed for toddlers. Toddler milk and drinks are drinks supplemented with nutrients and typically contain added sugars. Necessary nutrients can be obtained from cow's milk or a fortified soy beverage and appropriate solid foods.

Concerns exist about potential negative health effects of caffeine for young children, and no safe limits of caffeine have been established for this age group.



"Alexa, Enable the MyPlate Skill"

MyPlate is now available on Alexa! Get MyPlate nutrition information for infants and toddlers straight to your home on an Amazon Alexa device, on your smartphone or tablet via the free Amazon Alexa app. MyPlate on Alexa provides healthy eating tips for parents and caregivers on what and how to feed infants and toddlers based on their age (between four to 24 months). Parents and caregivers can receive science-based food and nutrition advice to set their child up for lifelong healthy eating habits. To get started, simply say "Alexa, enable the MyPlate skill" into an Alexa smart speaker or the free Alexa mobile app. To learn more visit: <https://www.myplate.gov/myplateassistant>¹⁸

REFERENCES

1. 2020 Dietary Guidelines Advisory Committee and Nutrition Evidence Systematic Review Team. The Duration, Frequency, and Volume of Exclusive Human Milk and/or Infant Formula Consumption and Overweight and Obesity: A Systematic Review. 2020 Dietary Guidelines Advisory Committee Project. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, July 2020. Available at: <https://nrs.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews>.
2. Section on Breastfeeding (2012). Breastfeeding and the use of human milk. *Pediatrics*, 129(3), e827–e841. <https://doi.org/10.1542/peds.2011-3552>
3. World Health Organization. (n.d.). *Breastfeeding*. World Health Organization. Retrieved from: https://www.who.int/health-topics/breastfeeding#tab=tab_1.
4. National Association of Pediatric Nurse Practitioners (NAPNAP). (2019). Position statement on breastfeeding, *Journal of Pediatric Health Care*. Retrieved from: [https://www.jpedhc.org/article/S0891-5245\(18\)30479-6/fulltext](https://www.jpedhc.org/article/S0891-5245(18)30479-6/fulltext)
5. Wagner, C. L., & Greer, F. R. (2008). Prevention of rickets and vitamin D deficiency in infants, children, and adolescents. *PEDIATRICS*, 122(5), 1142–1152.
6. Center for Food Safety and Applied Nutrition. (2021, February 24). *FDA advises parents and caregivers to not make or feed homemade infant*. U.S. Food and Drug Administration. Retrieved from <https://www.fda.gov/food/alerts-advisories-safety-information/fda-advises-parents-and-caregivers-not-make-or-feed-homemade-infant-formula-infants#:~:text=The%20FDA%20does%20not%20recommend,serious%20health%20and%20safety%20concerns.&text=Because%20of%20these%20severe%20health,their%20infants%20homemade%20infant%20formulas>.
7. Centers for Disease Control and Prevention. (2021, June 11). *Proper storage and preparation of breast milk*. Centers for Disease Control and Prevention. Retrieved from <https://www.cdc.gov/breastfeeding/recommendations/handling-breastmilk.htm>.
8. Kleinman R. E. (2000). American Academy of Pediatrics recommendations for complementary feeding. *Pediatrics*, 106(5), 1274.
9. Greer, F. R., Sicherer, S. H., Burks, A. W., COMMITTEE ON NUTRITION, & SECTION ON ALLERGY AND IMMUNOLOGY (2019). The Effects of Early Nutritional Interventions on the Development of Atopic Disease in Infants and Children: The Role of Maternal Dietary Restriction, Breastfeeding, Hydrolyzed Formulas, and Timing of Introduction of Allergenic Complementary Foods. *Pediatrics*, 143(4), e20190281.
10. *Prevention of allergies and asthma in children*. American Academy of Allergy Asthma & Immunology. (n.d.). Retrieved from <https://www.aaaai.org/Tools-for-the-Public/Conditions-Library/Allergies/prevention-of-allergies-and-asthma-in-children>.
11. Sciences, N. A. of. (2020, July 8). *Feeding infants and children from birth to 24 months: Summarizing existing guidance*. Summarizing Existing Guidance | The National Academies Press. Retrieved from <https://www.nap.edu/catalog/25747/feeding-infants-and-children-from-birth-to-24-months-summarizing>.
12. Center for Food Safety and Applied Nutrition. (2021, April 8). *Metals and your food*. U.S. Food and Drug Administration. Retrieved from <https://www.fda.gov/food/chemicals-metals-pesticides-food/metals-and-your-food>.
13. *Starting solid foods*. HealthyChildren.org. (2021, March 17). Retrieved from <https://www.healthychildren.org/English/ages-stages/baby/feeding-nutrition/Pages/Starting-Solid-Foods.aspx>.
14. *Sample menu for a Baby 8 to 12 months old*. HealthyChildren.org. (2021, March 17). Retrieved from <https://www.healthychildren.org/English/ages-stages/baby/feeding-nutrition/Pages/Sample-One-Day-Menu-for-an-8-to-12-Month-Old.aspx>.
15. Lott M, Callahan E, Welker Duffy E, Story M, & Daniels S. (2019, September 1). *Consensus statement. healthy beverage consumption in early childhood: Recommendations from Key National Health and Nutrition Organizations*. Healthy Eating Research. Retrieved from <https://healthyeatingresearch.org/research/consensus-statement-healthy-beverage-consumption-in-early-childhood-recommendations-from-key-national-health-and-nutrition-organizations/>.
16. *Policy on Early Childhood Caries (ECC): Consequences and Preventive Strategies*. America's Pediatric Dentists. (2021). Retrieved from <https://www.aapd.org/research/oral-health-policies--recommendations/early-childhood-caries-classifications--consequences-and-preventive-strategies/>.
17. *MyPlate on Alexa*. MyPlate. (n.d.). Retrieved from <https://www.myplate.gov/myplateassistant>.