

Homemade Baby Food

Making your own baby food is a good way to: save money, provide tasty and nutritious food for baby, get baby used to the food you serve in your program, and may even help baby to have fewer allergies. A recent study in the UK showed that older babies whose eating pattern was rich in fruits, vegetables and home-prepared foods developed fewer food allergies before age 2¹.

First Complementary Foods:

One generally doesn't even need to think about making baby food until the child is able to sit up on their own, has good head and neck control, and leans forward and opens their mouth when they are interested in food. This is generally sometime around 6 months of age. Younger infants often still have the reflex motion of pushing solid or mushy things out of their mouth with their tongue.

Families with increased genetic risk for Type 1 Diabetes may want to start baby on solid food as early as 4-5 months, according to recent research by the University of Colorado in Aurora. In that study, published July 2013, babies who started on solid foods after 4 months of age, but before 6 months, and whose moms continued to breastfeed while introducing new foods, were less likely to develop Type 1 Diabetes before age 5, than babies who were fed before 4 months or after 6 months, or whose moms discontinued breastfeeding.

The first solid foods the breast fed baby needs are those with iron and zinc, because babies at this age require more iron and zinc for growth than what mom's breast milk provides at this time. We are not looking to replace mom's milk, only add to her milk with complementary foods. The American Academy of Pediatrics recommends that moms continue to breastfeed until baby is at least 12 months of age. When feeding meals, give a bottle of breast milk first, then a bit of food, and you can follow up with the rest of the baby's bottle if it is within an hour of starting the feeding. Although we used to be told to feed iron fortified baby cereal as a first food, red meat is actually a better absorbed source of both iron and zinc. Formula fed infants already get iron and zinc from their formula; However a big challenge for formula-fed infants is maintaining their iron intake after they are weaned from formula onto cow's milk². So it's a good idea to get them used to eating iron-rich foods long before they are weaned, just as you would with a breast fed infant.

Beef as a first food provides enough iron and zinc for breastfed infants to maintain good iron and zinc status³, and results in larger head circumference than fortified cereal-fed infants. In addition, beef-feeding results in more beneficial butyrate-producing bacteria in the colon⁴ than baby cereal (the cells lining the colon prefer butyrate as an energy source⁵, which helps grow the gut and prevent colon cancer and ulcerative colitis).

There is a buzz happening about feeding babies homemade baby food, some of which contain nitrates. This is only applicable to babies fed solid foods before 3 months of age, when their systems are not able to deal with naturally occurring nitrates in foods. Since none of us will be feeding solid foods to babies under 3 months, we don't need to worry about it. If you must know this information, due to being somehow required to feed solid food to babies under 3 months, then avoid feeding them green beans, carrots, squash, spinach or beets which have been prepared at home. Other root vegetables and leafy vegetables may also have higher nitrate content. Commercial varieties of these baby food vegetables apparently do not have high nitrate levels. Organically grown vegetables have fewer nitrates in them because they are grown without nitrate based fertilizers. Why the concern about naturally-occurring nitrates? Babies under 3 months don't have enough acid in their stomachs to kill the bacteria which convert nitrates to nitrites (the pH of stomach acid in babies gradually decreases from 3 to 6 months). These nitrites are thus absorbed into the blood stream and convert the baby's hemoglobin to methemoglobin, which is unable to transport oxygen. The babies become blue, or cyanotic, and require immediate assistance at the hospital. Most cases involve ingestion of water from nitrate-contaminated wells. If you have a well for your water, it'd be a good idea to get your water tested, since well water usually has more nitrates than city water.

To prepare beef for baby, cook 4 oz lean ground grass-fed organic beef in a pan with broth on low heat to 160 F⁶, then let it cool a bit and pop it all into the food processor, blender or baby food mill. If you need to add more liquid when pureeing, add broth or water. Adding a little baked sweet potato helps it become smooth in texture. This yields enough for about two days. If you want to cook up a whole pound at once, do so and then take out enough for today and tomorrow, and put the rest into the freezer. When using frozen baby food, defrost in the frig, re-heat it to 165 F, cool to serving temp, serve it, and throw the rest of the reheated food away. If you are using stew meat, be sure to cook it until it falls apart, so it will puree easily. Meat prepared in a stew is ideal for pureeing since it is usually soft and tasty.

Egg yolk contains more iron and about the same zinc content as lean ground beef, so it's a comparable alternative to beef, as are lamb, bison, elk or deer. Be sure to only purchase USDA Government Inspected Meats. It is recommended that only the egg yolk is served to children under 12 months old and is best served to babies warmed, but still runny. Hard-boil an egg 3-4 minutes, or cook sunny side up on low heat until white is solid but yolk is not. The yolk is the part of the egg with iron and zinc in it, so it is the most nutritious part of an egg for infants. Some people find their baby prefers egg yolk mixed with a bit of pureed liver, which is even higher in iron and zinc content than beef. Other people find their baby doesn't seem to like liver at all unless it's mixed with sweet potato or other sweet food. You can experiment to see what your baby likes. Keep in mind that, just like older kids, the first couple times

you try a food it may not be accepted well. Keep offering the food every day without any pressure to eat it and eventually your baby may learn to accept and like it. It may take up to seven times or more of offering a food before baby decides to swallow any, so keep the initial portions rather small, cultivate a positive outlook and put a smile on your face. Remember that playing with food at this age is the first step toward actually eating it.

You may have a vegetarian family in your care, who wants their baby to eat vegetarian as well. This is one that takes a bit more thought. Because vegetarian foods rich in zinc, such as milk, oats, and crimini mushrooms, tend to be low in iron. Whereas iron-rich vegetable foods, such as lentils and soybeans, have a form of iron which is not absorbed as well as heme/meat iron, and don't have as much zinc. Vegan infants, who aren't eating any meat, eggs or dairy foods, might need to take supplements of vitamins B-12 and zinc, in addition to the vitamin D supplements recommended for all breastfed infants⁷. Preparing vegetarian baby food is simple: just cook the dry beans until soft and then grind them in a baby food mill, food processor or blender.

After a week of giving a iron- and zinc-rich food by itself, one can add a vitamin C source to help increase iron and zinc absorption. Pureed mango is a good choice: smooth textured, very tasty and loaded with vitamin C. One mango peeled and cut up into the blender yields about 3/4 cup puree. You can kill any pathogens present in the fruit by heating the puree on the stove to 180 F and then cool to a feeding temp of less than 120 F. Since 3/4 cup is way more than one infant would probably eat over two days, it is best to take out a couple Tbsp to use today, then freeze the rest in small portions, thawing only one or two at a time, depending on how much your infant is eating at one sitting. Avocado, banana or baked sweet potato are other easy-to-mash choices to serve with meat, but are not as high in vitamin C as mango. The American Academy of Pediatrics no longer restricts which fruits and vegetables to puree and serve infants over 6 months, so you could use oranges or grapefruits pureed as a vitamin C source for infants; However citrus is harder to puree smoothly because of the section membranes. Parents of infants at high risk for developing food allergies, who have siblings or parents with food allergies, should consult their allergist regarding when to introduce various foods.

Adding other puree foods:

Once your baby is consuming iron and zinc-rich foods twice a day, plus a vitamin C-rich food at both those times, and wants more food, it's time to add other things. Don't stop feeding the iron- and zinc-rich foods, and vitamin C source, just add to them. Feed the same new food for 2 or 3 days before introducing another new food, so if they develop a rash, you know what might be causing it. Having a baby food mill is nice because you can generally use it to smash almost anything your toddlers and preschoolers are about to eat. An exception is firm meats like sausage, which don't seem to grind well in baby food mills.

Adding lumpy and finger foods:

At around 8½ months, baby is ready for soft lumpy foods like small curd cottage cheese or lentil soup. Once your baby can bring things to their mouth while sitting up, you can begin adding finger foods. The average age when a child can eat finger foods without gagging is 8½ months⁸, but some can master lumpy and finger foods as early as 5 months and some aren't ready until 15 months. Well-cooked green peas with their skins popped sitting on the high chair tray are a great finger food. They contribute nutrition and provide practice with fine motor skills, as well as a sense of independence, without a choking hazard. They can also help keep baby's hands busy while you try to get a spoon to their mouth. Other handy finger foods are diced baked sweet potato, slightly mashed baked beans, and small pieces of very soft pulled shreds of meat.

Food Safety Reminders when preparing baby food:

- Wash hands, food, and equipment before using to make baby food.
- Be sure to thoroughly cook foods being served to baby, bringing meat temp to 160 F, poultry temp to 165 F⁹, fruit puree temp to 180 F.
- It is best to avoid heating baby food in the microwave, because, just like baby bottles, microwave heating can cause hot spots and over- or under-heating. If you must, be sure to use microwave-safe dishes, and stir the food during and after heating.
- Make sure temp is below 120 F before serving.
- Never add honey or corn syrup to baby food, or feed to baby, because they may contain spores of botulism, which older people can handle, but babies cannot.
- Once baby has finished eating, throw away any left-over food in the dish - do not save it for another feeding. That's why, whether you are feeding from a homemade baby food container or commercial baby food jar it is best to pour some into another dish and feed from the dish - that way the leftovers still in the jar can be saved for later today or tomorrow.

Included are a couple of baby food recipes, and there are plenty of others out there.

Try: www.weelicious.com and wholesomebabyfood.momtastic.com

¹Grimshaw KE, et al. Diet and food allergy development during infancy: Birth cohort study findings using prospective food diary data. J Allergy Clin Immunol 2013 July S0091-6749(13)00912-3.

²Ghisolfi J, et al, Nutrient intakes of children aged 1-2 years as a function of milk consumption, cow's milk or growing-up milk. Public Health Nutr. 2013 Mar;16(3):524-534.

³Krebs NE, et al. Comparison of complementary feeding strategies to meet zinc requirements of older breastfed infants. Am J Clin Nutr. 2012 Jul;96(1):30-35.

⁴Krebs NE, et al. Effects of different complementary feeding regimens on iron status and enteric microbiota in breastfed infants. J Pediatr 2013 Aug;163(2):416-423.

⁵Barcenilla A, Pryde SE, et al. Phylogenetic Relationships of butyrate-producing bacteria from the human gut. Appl Environ Microbiol 2000 April;66(4):1654-1661.

⁶USDA Food Safety and Inspection Service. Ground Beef and Food Safety information sheet

⁷Mangels AR and Messina V. Considerations in planning vegan diets: infants. J Am Diet Assoc 2001 June;101(6):670-7.

⁸Carruth BR and Skinner JD. Feeding behaviors and other motor development in health children (2-24 months). J Am Coll Nutr 2002; 21(2):88-96.

⁹USDA Food Safety and Inspection Service – The Color of Meat and Poultry Information Sheet, July 2013

Meat as a First Complementary Food for Breastfed Infants for Improved Zinc and Iron Status



Objective

Assess the feasibility and effects of consuming either pureed beef or iron-fortified infant cereal as the first complementary food for infants.

Summary

Breast milk gives 9-month-old infants just 10 percent of the iron and zinc they need. Therefore iron-fortified cereal is often recommended to prevent iron deficiency. However, this solution does not account for infants' zinc needs. Nancy F. Krebs, M.D., M.S. and her team at the University of Colorado School of Medicine conducted research to identify foods that infants would accept and that would help meet their iron and zinc needs. They found that pureed meat was accepted by infants and improved their zinc and iron levels. Published in the February 2006 *Journal of Pediatric Gastroenterology and Nutrition* ("Meat as a first complementary food for breastfed infants: Feasibility and impact on zinc intake and status"), this study adds to a growing body of evidence encouraging pureed meat as a first food.

Method

In the randomized-feeding trial, 88 exclusively breastfed infants were fed either pureed beef or iron-fortified infant cereal as their first complementary food from 5 to 7 months of age. After that time, all food choices were left to the parents' discretion. But, until then, infants in the beef and cereal groups exclusively ate beef or cereal, respectively. Measures of zinc and iron status were taken at 9 months, and dietary, anthropometric and developmental data were taken up to 12 months.

Key Findings

The study found that giving pureed beef to infants as their first complementary food is both practical and a better way to improve zinc intake than using iron-fortified cereals.

- At 5 and 7 months, infants in the pureed beef group had significantly higher zinc and protein intake, while infants in the fortified-cereal group had significantly higher iron intake at 7 months.
- Infants accepted both the cereal and pureed meat, but at 7 months, infants in the meat group were consuming 90 percent of the Estimated Average Requirement (EAR) for zinc. Those in the cereal group were getting less than half of the EAR.
- Adjusting for variables, the only significant difference between the beef and cereal groups was the increase in head circumference during the 7- to 12-month interval for the beef group. Intakes of both zinc and iron at 7 months were predictors of head growth.
- By 9 months, 2 months after the intervention concluded, there were no differences in iron and zinc intake, but protein was still somewhat higher for the meat group.



Meat: A Smart First Food

Iron and zinc are important for the growth and development of infants and young children. Inadequate consumption of these nutrients can have long-lasting negative effects on children's learning, behavior and development. Breastfed infants 9 months of age and older get just 10 percent of the iron and zinc they need from breast milk, so they must rely on complementary foods for these nutrients. A study in the February 2006 *Journal of Pediatric Gastroenterology and Nutrition* found that the modest intake of zinc from the typical early complementary foods before 7 months (cereals, fruits and vegetables) provides only 30% of the EAR. Introducing babies 5 months or older to pureed beef while they continued to breastfeed was an effective way to provide the iron and zinc they need.

Why are Iron and Zinc Important for Infants?

Because most breastfed infants 6 months of age and older don't get enough iron and zinc, the Institute of Medicine (IOM) has identified iron and zinc as "priority nutrients." The IOM and the American Academy of Pediatrics encourage the introduction of complementary foods rich in iron and zinc, such as beef, to ensure that breastfed infants consume adequate amounts of these important nutrients.



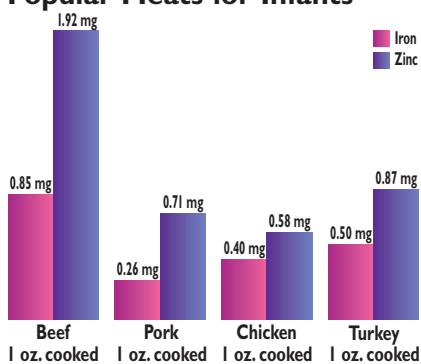
Iron

A child's growth and development depends on iron, which helps to make red blood cells that carry oxygen from the lungs to muscles and the brain. **Studies show that inadequate iron intake can have long-term consequences on learning, attention span and behavior.** Most babies are born with enough iron stores for the first 6 months of life; after 6 months, infants need a diet rich in iron to meet their needs. Animal products provide heme iron, a different form of iron than the non-heme iron found in plant and fortified foods. Heme iron is best absorbed by the body. As children progress through the feeding stages, serving beef along with plant and iron-fortified foods helps children absorb more of the non heme iron than if they ate these foods alone.

Zinc

Zinc is essential for growth and development. It is involved in the creation of DNA and helps the body break down carbohydrates, fats and proteins so they can be used for energy. Zinc boosts immunity and also helps the body heal wounds and maintain normal blood glucose levels. **Research suggests that zinc also has a role in improving recall skills, reasoning and attention.** The zinc content of breast milk gradually decreases over time, so it's important to introduce foods rich in zinc when infants progress to solid foods. Animal and plant foods supply zinc, but as with iron, zinc is better absorbed from meat and other animal products. Beef is the number one food source of zinc in the American diet.

Iron and Zinc Content of Popular Meats for Infants



Sources:

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3. The Institute of Medicine. *WIC Food Packages: Time for a Change*. December 2005.
4. American Academy of Pediatrics. *Pediatric Nutrition Handbook*. Fifth Edition. American Academy of Pediatrics. 2004.
5. Mahan LK, Escott-Stump S. *Krause's Food, Nutrition, & Diet Therapy, 11th Edition*. Saunders/Elsevier. 2004.
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7. U.S. Department of Agriculture, Agricultural Research Service. 2006. USDA Nutrient Database for Standard Reference, Release 19. Nutrient Data Laboratory Home Page, <http://www.ars.usda.gov/ba/bhnrc/ndl>. Beef, NDB No: 13364; Pork, NDB No: 10093; Chicken, NDB No: 05126; Turkey, NDB No: 05168.

HOW MUCH IRON AND ZINC DO CHILDREN NEED?

Age	Iron Recommended Dietary Allowance/Adequate Intake*	Zinc Recommended Dietary Allowance/Adequate Intake*
0-6 months	0.27 mg/day	2 mg/day
7-12 months	11 mg/day	3 mg/day
1-3 years	7 mg/day	3 mg/day
4-8 years	10 mg/day	5 mg/day

*= Adequate Intake (AI). RDAs and AIs may both be used as goals for individual intake. RDAs are set to meet the needs of almost all individuals in a group. For healthy breastfed infants, the AI is the mean intake.



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Making Your Own Baby Food

MAKING YOUR OWN BABY FOOD FROM FAMILY FOODS

- ✓ usually costs less
- ✓ allows the baby to get used to the family foods

MAKE IT:

1. Keep it clean when preparing, storing, heating, or serving baby food.
 - ✓ Wash hands with hot water and soap
 - ✓ Wash all equipment in hot, soapy water. Rinse under hot running water and air dry.
2. Select foods without added salt, sugar, fat or spices. Prepare fruits and vegetables by washing, peeling, and removing seeds. Meats should have bones, skin and visible fat removed.
3. Cook food until tender:
 - ✓ by baking
 - ✓ by boiling in a little water
 - ✓ by steaming
4. Using a food grinder, blender, fork, resealable plastic bag, or potato masher to mash the food or force the food through a strainer until it is smoother. Add liquids such as cooking water, juice, or formula until food is of the correct thickness (babies 4-6 months old need thinner food).

STORE IT:

1. In the refrigerator:
 - ✓ Cover the food tightly and keep cooked fruits and vegetables no longer than 3 days; raw fruits and cooked meats only 2 days.
2. In the freezer
 - ✓ Fill sections of an ice cube tray with the prepared baby food or take several tablespoons of food and make “dollops” of food on a cookie sheet.
 - ✓ Cover the ice cube tray or cookie sheet with wax paper and freeze until solid.
 - ✓ Label and date freezer-safe plastic bags.
 - ✓ Remove cubes or “dollops” from freezer, place in labeled plastic bags, and return to freezer. The food will keep up to two months.

SERVE IT:

1. Refrigerated baby food:
 - ✓ Place amount of food needed in a serving dish (return remaining food to refrigerator.)
 - ✓ Heat the food in the serving dish until warm.
 - ✓ **Throw away what the baby does not eat.**
2. Frozen baby food:
 - ✓ Thaw frozen cubes or “dollops,” covered, **in the refrigerator.**
 - ✓ Heat food to 165° Fahrenheit, cool before feeding. Test temperature on your wrist.
 - ✓ **Throw away what the baby does not eat.**

This material was funded by USDA's Food Stamp Program. The Food Stamp Program provides nutrition assistance to people with low income. It can help you buy nutritious foods for a better diet. To find out more, contact your county social services office. Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Glen Whipple, Director, Cooperative Extension Service, University of Wyoming, Laramie, Wyoming 82071. Persons seeking admission, employment, or access to programs of the University of Wyoming shall be considered without regard to race, color, religion, sex, national origin, disability, age, political belief, veteran status, sexual orientation, and marital or familial status. Persons with disabilities who require alternative means for communication or program information (Braille, large print, audiotape, etc.) should contact their local UW CES Office. To file a complaint, write the UW Employment Practices/Affirmative Action Office, University of Wyoming, P.O. Box 3434, Laramie, Wyoming 82071 3434



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