

Nutrition for the lactating mother

Except in malnourished communities, there is little evidence that dietary calories, protein, fat, water, or anything else have a consistent effect on milk volume. Regular and fairly frequent suckling is the well established stimulus.

Some constituents in the milk are affected by the mother's intake.

(1) Fatty acid pattern, vitamin A, thiamin, riboflavin, biotin, folate, vitamin B-12, and vitamin C are affected, especially downwards if the mother's diet is deficient.

(2) Zinc, iron, fluoride, and vitamin D may be responsive in some circumstances, but more research is needed.

(3) Protein, lactose, total fat content, calcium—that is, the major proximate constituents of milk—do not appear to be affected.

(4) Specific proteins in the mother's diet might be excreted intact in small amounts and an allergic (IgE) reaction occasionally occurs in the baby.

(5) Most chemicals enter the mother's milk, so it is essential that the mother check with her obstetrician before using any medicines or nutritional supplements. Caffeine can cause the infant to be irritable. Alcohol in excess, tobacco, and illegal drugs can be very harmful . Milk production is reduced in heavy smokers.

(6) The fat-soluble environmental contaminants, polychlorinated biphenyls, dry cleaning solvents, and organochlorine insecticides (DDT, etc), are stored in adipose tissue and excreted in the cream of breast milk (though the DDT group is fairly innocuous in man).

Most of the nutrients come along with the extra calories; lactating women usually have a good appetite and if this is satisfied by a mixed diet the nutrients that need watching (because there is little excess in the diets of non-lactating women) are calcium, iron, folate, and vitamin D. The extra

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calcium can come from a pint of milk or two cartons of yoghurt. Calcium metabolism changes during lactation. There is some loss of bone density, which is apparently not prevented by calcium supplements. These changes are reversed when lactation ceases. There is no evidence that women who have breast fed have increased incidence of osteoporosis.

Iron supplements may be advisable, and vitamin D supplements are recommended for any mother whose vitamin D status is in doubt (such as Asian mothers eating a wholly vegetarian diet). Folate deficiency incurred during pregnancy may first show as anaemia in the puerperium. Zinc is secreted in the milk but studies show increased zinc absorption during lactation.

There is no need to stop breastfeeding when returning to work; a breast pump can be used to express milk for feedings when the mother is not available. Breast milk will keep 8 to 10 hours at room temperature , 8 days in the refrigerator, 3 to 4 months in the refrigerator freezer, and 12 months in a deep freezer. Previously frozen milk must be used within 24 hours after defrosting in the refrigerator. Breast milk should not be heated in the microwave or directly on the stove. Those methods of heating breast milk will kill its immune-enhancing ability.

Calorie Requirements during Lactation

The mother's calorie requirement increases during lactation. The caloric requirement depends on the amount of milk produced. Approximately 85 calories are required to produce 100 ml of milk. During the first 6 months, average daily milk production is 750 ml , and for this the mother requires approximately an extra 640 calories a day. During the second 6 months, when the baby begins to eat food in addition to breast milk, average daily

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milk production slows to 600 ml ,and the caloric requirement is reduced to approximately 510 extra calories a day.

The Food and Nutrition Board suggests an increase of 500 calories a day during lactation. This is less than the actual need because it is assumed that some fat has been stored during pregnancy and can be used for milk production. The precise number of calories the mother needs depends on the size of the infant and its appetite and on the size and activities of the mother. Each 28ml of human milk contains 20 calories.

If the mother's diet contains insufficient calories the quantity of milk can be reduced, as seen in many third world countries. Thus, lactation is not a good time to go on a strict weight loss diet. There will be some natural weight loss caused by the burning of the stored fat for milk production.

Nutrition for the Preterm Infants

Optimal nutrition is critical in the management of pre-term infants. Breast milk or fortified breast milk is considered ideal for the pre-term infant. Human milk fortifiers can be added to breast milk for the pre-term infant to provide additional calories, protein, zinc, calcium, phosphorous, and folic acid. Powdered formula can be used to fortify breast milk once the infant is discharged home.

Breast milk provides many advantages to pre-term infants in the form of growth factors, immunity to infection, support for the developing gastrointestinal tract, and enhanced calcium and phosphorus profiles. Breastfed babies have a lower incidence of ear infections, diarrhea, allergies, and hospital admissions. Breastfed babies receive immunities from their mothers for the diseases

When a baby becomes ill, the bacteria causing the illness is transmitted to the mother while the baby is breastfeeding; the mother's immune system

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will start making antibodies for the baby. Infants who are formula fed should receive specialized pre-term formulas in the nursery and be discharged on pre-term follow-up formulas to allow continued growth and improvement in bone mineral density during the first year of life.

Iron should be supplied to human milk-fed pre-term babies at 1 month of age (2 mg/kg/day) until one year. All infants who are breast-fed should be supplemented with vitamin D (400 IU/kg/day) to support bone formation. Pre-term infants are at high risk for rickets of prematurity due to inadequate calcium intake early in life. Therefore, alkaline phosphatase, calcium, and phosphorous levels should be monitored.

Nutrition for the Term Infant

The WHO and the American Academy of Pediatrics (AAP) strongly recommend exclusive breastfeeding infants for the first 6 months of life. Many mothers will require support to successfully breastfeed their infants.

Advantages of Breastfeeding

Human milk is unique in its components and dynamic nutrient composition. Composition changes throughout lactation and provides a higher protein, more digestible mixture for pre-term infants . Human milk contains the omega-3 fatty acids arachidonic acid (ARA) and docosahexanoic acid (DHA) which are essential for visual function and neurodevelopment in infants. Carbohydrates, in the form of lactose and oligosaccharides, are easily digested.

Calcium and phosphorus, though present in lower levels than in cow's milk formulas, are more bioavailable in breast milk to support bone growth. Other micronutrients are adequate to meet the infant's nutritional needs until age 6 months when iron-fortified infant cereal should be introduced. Human

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milk contributes to the maturation of the gastrointestinal tract and provides a host of bioactive factors, including secretory IgA, lactoferrin, lysozyme, nucleotides, all supporting the immunity of the child.

Even so, there are some cautions that should be stated regarding breastfeeding.

Women who are infected with HIV should not breastfeed. A second area of caution involves a breastfeeding mother who is a strict vegetarian or a vegan. Several cases have been reported in the literature of infants with vitamin B12 deficiency who were breast-fed by vitamin B12 deficient mothers with an extended history of vegan diets. Infants of vegan mothers should be monitored for signs of vitamin B12 deficiency which include lethargy, failure to thrive, developmental delay, or macrocytic anemia.

ADVANTAGES OF BREASTFEEDING FOR THE

A- Mother

- Promotes optimal maternal–infant bonding
- Simulates uterine contractions to help control postpartum bleeding and regain prepregnant uterus size
- Is readily available and requires no mixing or dilution
- Is less expensive than purchasing bottles, nipples, sterilizing equipment, and formula.
- Decrease risk of breast and ovarian cancer and type 2 diabetes .
- Reduces postpartum bleeding and delays resumption of menstruation.
- Conserves iron stores by prolonging amenorrhea
- Improves bone density and reduces risk for hip fracture
- Reduces risk of postpartum depression

B- Infant

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- Increases bonding with mother
- Optimal “natural” nutrition that contains no artificial colorings, flavorings, preservatives, or additives
- Safe and fresh
- Reduces risk of acute otitis media, nonspecific gastroenteritis, severe lower respiratory tract infections, and asthma
- Enhances immune system
- Protects against allergies and intolerance
- Promotes better tooth and jaw development than bottle feeding because the infant has to suck harder
- Associated with higher IQ and school performance through adolescence
- Reduces the risk of chronic diseases, such as obesity, type 1 and 2 diabetes, heart disease, hypertension, hypercholesterolemia, and childhood leukemia, Crohn’s disease and lymphoma.
- Reduces risk for infant morbidity and mortality

FACTORS AFFECTING MILK SECRETION

A- MATERNAL FACTORS

- Stress / Anxiety (may decrease production and milk ejection reflex);
- Separation of mother and child (eg, return to work, school);
- Hormonal imbalance (thyroid gland, polycystic ovary syndrome, diabetes type 1 or 2);
- New pregnancy;
- Insufficient breast tissue (tube-shaped breasts);
- Surgery to the breast or nipple;

- Mother who does not wake up (drugs, alcohol, medication);
- Breast injury/bad breastfeeding position;
- Misuse of the teat (less efficient stimulation);
- Poor nutrition of the mother (less than 1500 calories per day).

B- INFANT FACTORS

- Baby refusing the breast (rapid flow, flat nipple, large nipple);
- Baby sleeping for long periods or that does not wake up (jaundice, prematurity, certain medication);
- Long periods between feedings (baby does not wake up at night);
- Weak suction (premature baby, sick baby, trisomy 21);
- Short tongue frenulum.

The consequence of insufficient milk production is that the baby will not gain weight normally. It is therefore important to refer to a physician or a nutritionist. A healthcare professional will be able to identify the cause of insufficient milk production, and thus to better advise breastfeeding women. Additional resources for breastfeeding support are also available.