

Pre-
conception

Conception



270 days

9 months pregnancy



365 days

1st birthday



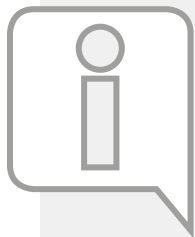
365 days

2nd birthday



Why the first 1000 days of life matter

The first 1000 days of life – the period between conception and a child's 2nd birthday – are a unique window of opportunity to support child development and long-term health. This critical period of time has an enormous short- and long-term impact on the health and wellbeing of unborn babies, infants, and young children, as well as on the pregnant and lactating women.^{1,2} Environmental factors and nutrition during this 1000 day-window can have positive effects on a baby's growth, brain development, digestive tract, metabolism, and immune system. For this reason, a well-balanced diet with essential nutrients in optimal amounts during early life plays a crucial role in programming future health.



During pregnancy, the baby is also exposed to environmental factors such as nutrition or toxic and hazardous agents that the mother is exposed to. These factors, including maternal health

status and disorders such as obesity and diabetes, can alter foetal metabolism, growth, hormonal response, gene expression, and other variables with an impact on lifelong health - which is called **early developmental programming of adult health**. This may influence the child's risk of stunting, obesity, allergies, diabetes, cardiovascular, and skeletal diseases in later life.

Pre-conception

Before getting pregnant, women should pay attention to several recommendations:³



- Healthy lifestyle including regular physical activity
- No alcohol and nicotine consumption
- Control of chronic conditions such as diabetes and hypertension
- Screening, treatment, and prevention of infectious diseases
- Getting all required immunisations



- Approaching and maintaining a healthy body weight



- Healthy, balanced diet rich in vegetables, fruits, protein, sea fish, and essential fats, low in sugar, sweets, and saturated fats
- Supplementation of folic acid and potentially other nutrients to prevent child birth defects

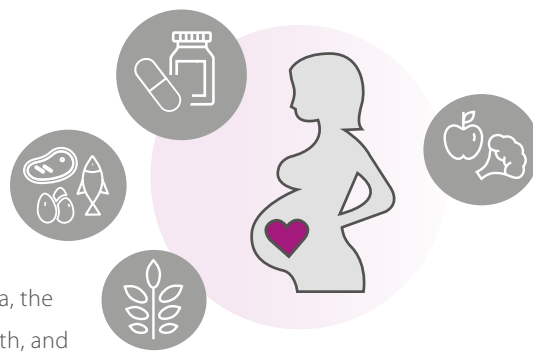
During pregnancy

Balanced diet and nutrient supplements

The energy requirement during pregnancy is often overestimated in the belief that pregnant and breastfeeding women need to "eat for two". In fact, the energy requirement is only minimally increased during pregnancy - it is about 10% (~ 200-250 kcal/day) higher at the end of pregnancy.⁴ This corresponds to only one slice of whole grain bread and an apple, for example. However, the needs for several micronutrients in pregnant women increases much more than energy needs. Therefore, attention should be paid to a balanced diet providing adequate essential nutrients (e.g. rich in vegetables, fruits, fish, whole grain, and milk products) and targeted nutrient supplementation as recommended by the attending physician.⁵ The approach can be summarised by the motto "Think for two – but don't eat for two".

Critical nutrients that often require special attention

- Iron, iodine, calcium, zinc, magnesium
- Vitamins (Folic acid/folate, vitamins A, B₆, B₁₂, C, D, E)
- Omega-3 fatty acids, e.g. docosahexaenoic acid (DHA)



Ensuring adequate nutrient intakes may reduce the risk of maternal anemia, the incidence of preterm birth, low birth weight, the risk of miscarriage, stillbirth, and pre-eclampsia. Additionally, they are also crucial for the baby's growth, bones, visual, and brain development.^{6,7}

Healthy lifestyle in pregnancy

Protective factors



- Healthy, balanced diet (e.g. vegetables, fruits, whole grain foods, sea fish twice a week)
- Moderate weight gain (depending on pre-pregnancy weight)
- Regular moderate physical exercise, such as hiking, swimming, running/walking or yoga
- Regular prenatal care visits
- Good work-life balance
- Sufficient amount of clean water

Risk factors



- Alcohol and nicotine consumption
- Passive smoking
- Certain illnesses, such as gestational diabetes or pre-eclampsia
- Exposure to high levels of psychosocial stress
- Excessive caffeine consumption (no more than 2 cups of coffee or 4 cups of black tea/day, no "energy drinks")
- Raw animal products (meat, fish, meat, fish, also smoked fish, or eggs, unpasteurised milk, raw cheese)
- Sugared drinks and juices, high intakes of sugar/sweets
- Specific medication use

Vegetarian or vegan diets

A carefully selected mixed vegetarian diet that contains milk and eggs can generally support the nutrient needs of a pregnant woman and a child, but the risk for some nutrient deficiencies (e.g. iron, iodine, zinc, DHA) and their consequences for the baby are higher. Families adhering to a lacto-ovo vegetarian diet should seek medical counselling and advice and, if appropriate, consider the use of nutrient supplements, e.g. a supplement with (vegetarian) DHA if no sea fish is consumed, and with iodine. Following a vegan diet (exclusion of all animal products) for a longer period of time has very high risks of not meeting the essential nutrient needs (e.g. vitamin B₁₂) of the developing child. Pregnant and breastfeeding women and children following a vegan diet need to take a supplement with vitamin B₁₂, (vegan) DHA, and preferably other critical nutrients such as iodine, iron, and zinc. Pregnant and lactating women who wish to follow any form of restrictive diets for themselves or their children should seek advice from a registered dietician and a physician.⁸

Infancy: 0 - 6 months

Breastfeeding period

Breast milk is the best and first choice for the nutrition of babies and should be initiated immediately after birth. It is recommended to exclusively breastfeed (no other food, formula, or water) babies for at least four to six months.^{8,9} The composition of breast milk is optimally adapted to the needs of the growing baby and helps to:

- Support immunity and protect from gastrointestinal and respiratory infections
- Support optimal neurodevelopment
- Reduce the risk for later development of obesity and other non-communicable diseases such as diabetes

In addition, breastfeeding promotes the emotional bonding between mother and baby and may contribute to risk reduction for maternal breast cancer, ovarian cancer, and obesity. Whenever mothers are not or not yet able to breastfeed their baby, quality controlled donor milk and infant formula are alternative options.^{5,10-12}

Healthy lifestyle during breastfeeding and in parenthood

As long as the mother has a balanced diet, her breast milk generally provides the nutrients required for healthy growth and development of the baby in adequate amounts. Exceptions are the vitamins K and D which must be supplemented. Supplementation of fluoride reduces the risk of dental caries.¹³ However, breastfeeding women have an increased need for several micronutrients (e.g. iodine, vitamins, and the omega-3-fatty acid DHA), and a healthy lifestyle and balanced diet are important during breastfeeding. Therefore, the recommendations for a healthy lifestyle during pregnancy generally apply for breastfeeding women as well.

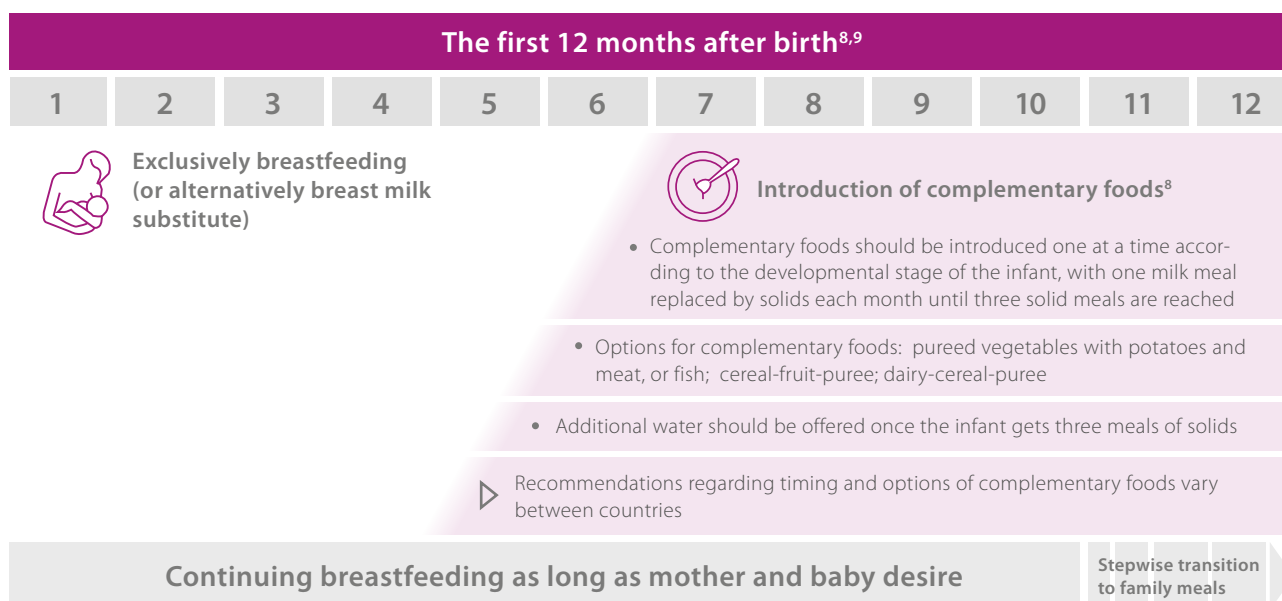
Recommendations for breastfeeding women

- Continued healthy, balanced diet and an adequate water intake
- Limited caffeine consumption
- No nicotine and alcohol consumption
- No passive smoking: friends and family should be asked to smoke outside
- Proper hand washing for parents and children

Baby- and toddlerhood: 6 - 24 months

Complementary feeding

Appropriate complementary foods (i.e. solid foods and liquids other than breast milk or infant formula) should be initiated not before the beginning of the 5th month (17 weeks) and not after the beginning of the 7th month (26 weeks) – while continuing breastfeeding as long as mother and baby desire.⁸ As all babies develop at a different pace, parents should pay attention to developmental signs to know when the baby is ready for solid foods.



Complementary feeding should include a wide variety of flavours and foods, especially vegetables, fruits, whole grains, proteins, and animal-source foods to cover the nutritional needs of the growing child. Furthermore, iron rich foods (e.g. meat), as well as fish once or twice a week are recommended. Nutrient-poor foods that contain excessive sugar, fat, or salt should be avoided. Spoon feeding is very important for age-appropriate development. To provide adequate nutrition and promote healthy eating habits in infants, cultural practices, maternal preferences, and available foods have to be taken into account.⁸

Foods and beverages to be avoided⁸

- Cow's milk in the first year of life (small amounts of cow's milk can be mixed with food from six months)
- Sugar-sweetened beverages, fruit juices, and sweet infant teas
- Honey, that is not fully pasteurised, should be avoided in the first year of life

Supplements in the first year of life⁹

- Supplementation of vitamin K is recommended for protection against bleeding
- Vitamin D and fluoride protect the baby's bones and teeth

About EFCNI

The European Foundation for the Care of Newborn Infants (EFCNI) is the first pan-European organisation and network to represent the interests of preterm and newborn infants and their families. It brings together parents, healthcare experts from different disciplines, and scientists with the common goal of improving long-term health of preterm and newborn children by ensuring the best possible prevention, treatment, care, and support.

For more information, visit us at www.efcni.org

Special thanks to Prof Berthold Koletzko for his support and advice.

The factsheet "Why the first 1000 days of life matter" is kindly supported by DSM and Nestlé Nutrition Institute.

References:

1. Hanson MA et al. International Journal of Gynecology and Obstetrics. 2015;131(S4): 213-253.
2. Koletzko B et al. Ann Nutr Metab. 2017;70:161-169.
3. Snyder TM in: The Biology of the First 1,000 Days. 2018;423-438.
4. Koletzko B et al. Dtsch med Wochenschr. 2012;137(24): 1309-1314.
5. World Health Organization. Essential nutrition actions: improving maternal, newborn, infant and young child health and nutrition. 2013.
6. Bhutta ZA et al. The Lancet. 2013 Aug 3;382(9890):452-77.
7. Christian P et al. Int J Epidemiol. 2013 Oct;42(5):1340-55.
8. ESPGHAN Committee on Nutrition. Journal of Pediatric Gastroenterology and Nutrition. 2017 Jan;64(1):119-32.
9. Prell C, Koletzko B. Deutsches Ärzteblatt International. 2016;(113):435-44.
10. Rebhan B et al. Acta Pædiatrica. 2009 Jun 1;98(6):974-80.
11. Horta BL, World Health Organization. Evidence on the long-term effects of breastfeeding: systematic reviews and meta-analyses. 2007.
12. Agostoni C et al. J Pediatr Gastroenterol Nutr. 2010 Jan;50(1):85-91.
13. Kühnisch J et al. Clin Or Investig. 2017;21(7):2283-2290.