

Dietary guidelines for the breast-feeding woman

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Abstract

Sociodemographic and economic changes in Spain have played a role in the choice of infant feeding as more and more women enter the workforce. Nevertheless, the prevalence of breast-fed-only infants at 6 weeks remains fairly high, at 65.5% in 1999, although there is a sharp decline by 3 and 6 months postpartum. Achieving adequate nutritional status for lactation principally begins during pregnancy, as this constitutes the biological stage for accumulating nutrient stores. The benefits of breast-feeding for the mother and infant are presented, along with nutrition and dietary guidelines for the nursing woman. Apart from dietary considerations, special attention should be paid to encouraging a positive attitude and environment for breast-feeding success.

Keywords
Breast-feeding
Dietary guidelines
Food guide
Nutrition requirements

Lactation is defined as the period of the newborn infant's life in which breast-milk is the primary source of nourishment. Breast-milk is the food that provides the infant with all of the necessary elements to meet nutritional needs. Mammalian milk is characterised by its inclusion of all nutritive substances in the exact proportions and balance unique to each species. Such is the case with human milk¹.

Until the 19th century, when mothers were no longer able or preferred not to raise their offspring, the practice of using wet nurses was widespread. These women would breast-feed not only their own children but also those of other mothers, so that these infants would continue receiving breast-milk. Although archaeological artefacts show the existence of utensils similar to modern-day baby bottles, it is widely accepted that the appearance of industrially prepared infant formula milk is a contemporary phenomenon. These preparations are elaborated using derivatives of mammalian milk other than humans', principally that of cows.

The possibilities offered by today's modern technology have made a plethora of products available to the consumer. Some of these artificial formulas are, without a doubt, indispensable in specific cases. However, when no definite contraindication for breast-feeding exists, mother's milk is clearly superior and specific for human infants².

In Spain, many sociodemographic as well as economic changes have occurred in the past decades. The role of women has also been affected, as seen by their increased participation in the labour force and subsequent changes. Although, in general, limited data are available for patterns in infant feeding practices, a study carried out

in Madrid demonstrated that Spain followed the general decline in breast-feeding incidence that took place in Western countries in the 1960s and 1970s, with a subsequent upwards trend that continues to the present³. Figure 1 shows more recent national trends in infant feeding practices. Breast-feeding prevalence appears to have improved at 6 weeks, 3 months and 6 months. However, this does not negate the phenomenon of a sharp decline of exclusive breast-feeding by 6 months (65.5% at 6 weeks, 43.8% at 3 months and 21.2% at 6 months) with a concomitant increase in breast-milk substitutes^{4,5}. This could be explained by the fact that, in Spain, the percentage of women in the workforce has increased from 28% in 1986 to 39%, and that paid maternity leave consists of a period of four months⁶.

Human milk

Breast-milk is the ideal food for newborn infants and, as such, respecting an individual's freedom of choice, constitutes the preferred method of infant feeding. Studies show that breast-fed infants have fewer problems with infectious and non-infectious diseases, and experience milder cases of respiratory and ear infections as well as diarrhoea than non-breast-fed babies⁷. The specificity of breast-milk's components for the human infant makes it the ideal food for meeting nutrient needs for growth and development. This can be seen, for example, in its lower total protein and casein content when compared with cow's milk, which makes human milk more digestible and less demanding for infants' immature kidneys⁸. Other studies suggest that the lower weight gain pattern seen in breast-fed infants in the first year of life, accompanied by

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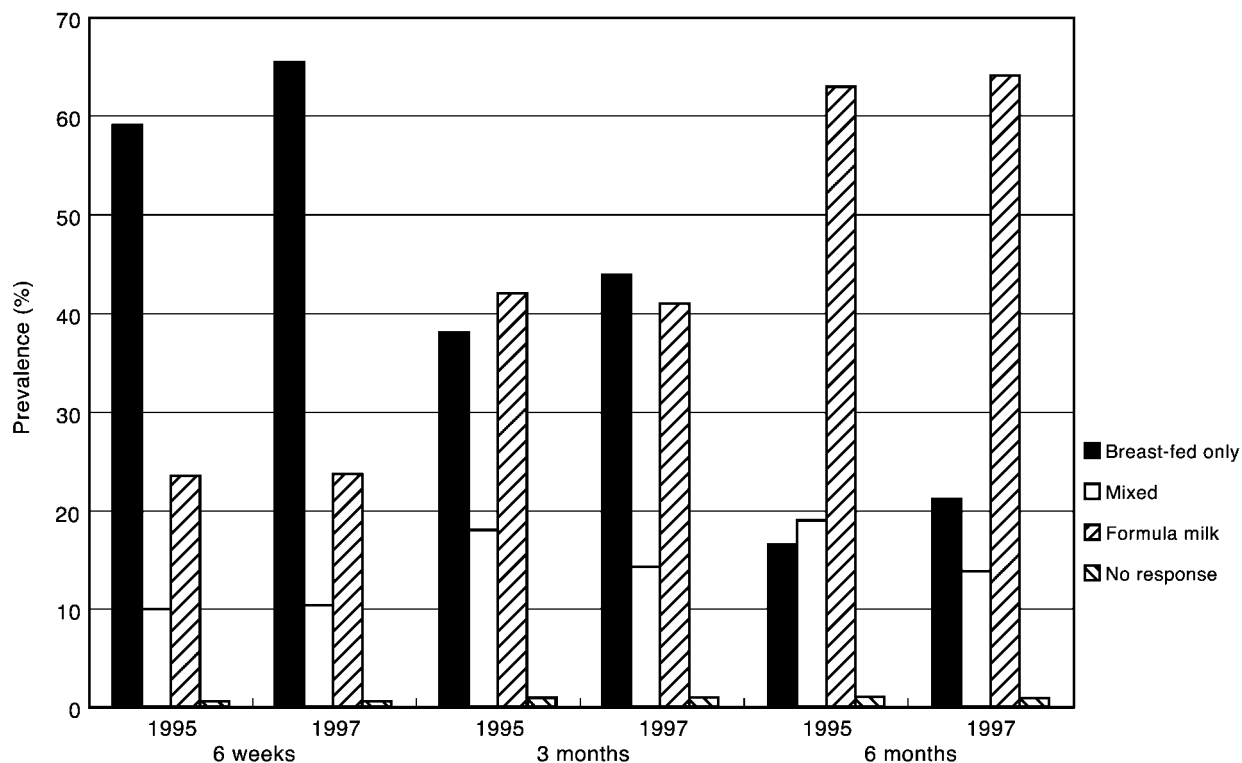


Fig. 1 Breast-feeding prevalence in Spain^{4,5}

normal activity and development, may lead to less overweight and obesity in childhood and adulthood^{9–11}.

Further evidence has demonstrated that breast-feeding may have beneficial effects on reduced chronic disease risk and enhanced development. Recent studies show potential relationships between breast-feeding and decreased risk for celiac disease, inflammatory bowel disease, type 1 and 2 diabetes, childhood cancer and allergic disorders/asthma^{12–22}. Other investigators provide stimulating evidence for a positive association between breast-milk and cognitive evolution, particularly for the long-chain polyunsaturated fatty acids (PUFAs) found in human milk and their role in infant brain growth and development^{23–26}.

A nursing mother also benefits from breast-feeding. The increased level of the hormone oxytocin promotes expulsion of the placenta, minimises postpartum blood loss, and facilitates a more rapid uterine involution²⁷. Psychological benefits may also be manifested, such as increased self-esteem, and enhanced bonding between mother and infant^{28–30}. Additionally, breast-feeding can save several hundred dollars (US) from the costs of purchasing infant formula milk, even factoring in expenditures for breast pump equipment and increased food requirements of the breast-feeding mother³¹. A cost-benefit study has demonstrated a 20% reduction in medical care expenditures for fully breast-fed babies as compared with babies who have never been breast-fed³².

The multitude of advantages of breast-feeding for the

infant (nutritional, immunological and psychological) and nursing woman (physiological, psychological and emotional) makes nursing a gratifying experience for both mother and child. Additional factors such as the convenience of nursing, in that human milk is hygienic, readily available and without the need for preparation or heating, as well as being economical, reinforce breast-milk's position as the food of choice for infants.

Breast-feeding

Both mother and child participate in the act of nursing, and consequently breast-feeding success depends on the two of them. Women who, during pregnancy, have the desire and conviction to nurse can achieve it with sufficient support and encouragement. It is vitally important that their diet is adequate to meet the specific needs favouring milk production that will satisfy the nutrient requirements of the newborn. Another critical factor is the infant's suckling capacity, thus stimulating the initial secretion in the form of colostrum, which in turn evolves into mature breast-milk³³.

Successful breast-feeding begins during pregnancy, involving both a nutritional factor for building nutrient reserves in the preparation for nursing, as well as a psychological component, which takes into account the desire and willingness to breast-feed. These are essential elements in order to achieve breast-feeding goals, and as

Table 1 Recommended energy and nutrient intakes for the Spanish population (revised 1998; Department of Nutrition, Complutense University of Madrid³⁹)

	Women 20–39 years	Pregnancy		Lactation	
		2nd half	Adolescent	Adult	Adolescent*
Energy	2300 kcal 9623 kJ	+250 kcal +1046 kJ	+300 kcal +1300 kJ	+500 kcal +2092 kJ	+500 kcal +2100 kJ
Protein (g)	41	+15	+30	+25	+20
Calcium (mg)	800	+600	–	+700	–
Iron (mg)	18	18	–	18	–
Iodine (µg)	110	+25	–	+45	–
Zinc (mg)	15	20	–	25	–
Magnesium (mg)	330	+120	–	+120	–
Thiamine (mg)	0.9	+0.1	+0.4	+0.2	+0.5
Riboflavin (mg)	1.4	+0.2	+0.3	+0.3	+0.5
Niacin equivalents (mg)	15	+2	+2	+3	+5
Vitamin B ₆ (mg)	1.6	+2	+0.6	+1.5	+0.5
Folic acid (µg)	200	+200	+400	+100	+100
Vitamin B ₁₂ (µg)	2	2.2	+1.0	2.6	+1.0
Vitamin C (mg)	60	80	+20	85	+40
Vitamin A, retinol equivalents (µg)	800	800	+200	1.300	+400
Vitamin D (µg)	5	10	+5	10	+5
Vitamin E (mg)	12	+3	+2	+5	+3

* National Research Council, USA (1990).

such, appropriate personal and environmental surroundings should be considered and encouraged.

Protein and lipid reserves accumulated during pregnancy are of special importance as they constitute an indispensable condition for optimal milk production, which is not obtained if meeting nutrient recommendations occurs postpartum. As is well known, two hormones orchestrate human milk production: prolactin, which acts on mammary glands; and oxytocin, the release of which is stimulated by the infant's suckling and thus promotes the necessary contractions for milk secretion³⁴.

The World Health Organization (WHO) in their 45th World Health Assembly (May 1992) adopted the *Innocenti Declaration* in order to promote the practice of breast-feeding. More recently, in 1998, its Division of Child Health and Development published The Baby Friendly Hospital Initiative that includes 'The Ten Steps to Successful Breastfeeding'. Steps 2, 3 and 10 of this important document are worth highlighting³⁵:

- Step 2 – Train all health care staff in skills necessary to implement this policy.
- Step 3 – Inform all pregnant women about the benefits and management of breast-feeding.
- Step 10 - Foster the establishment of breast-feeding support groups and refer mothers to them on discharge from the hospital or clinic.

Health professionals play a vital role in supporting the nursing mother and should be aware of their influence towards promoting breast-feeding initiation and success. The practice of lactation, as other processes in life, needs to be learned and is not innate knowledge for the first-time breast-feeder³⁶.

Nutritional needs of the breast-feeding woman

As in pregnancy, the nursing mother first needs to focus on meeting her nutritional requirements as well as the extra physiological demands³⁷. According to Fernández Ballart³⁸, 'key determinants at this stage are the composition and volume of secreted milk along with the nutritional status of the mother at the onset of this phase'.

The energy required to produce 1 litre of milk is estimated as around 700 kcal. As a consequence, current recommendations include increasing intake above the pre-pregnant requirements by 500 kcal day⁻¹. Increased energy demands should be met in order to ensure coverage of other nutrient requirements as outlined in Table 1³⁹. To this end, servings are increased from food groups that are more apt to provide nutrient as well as caloric adequacy.

Nutritional needs of the breast-fed infant

The quantity and quality of milk produced by a nursing woman depends on a variety of determinants, ranging from nutritional factors, emotional state and the infant's ability to suckle. Insufficient or inadequate food intake increases the fatigue common in postpartum women. Mothers of newborns often have to reorganise their personal and family life, adapt to fewer hours of sleep due to the frequency of nursing required at the onset of breast-feeding and deal with the often self-imposed pressure of their ability to 'be a good mother', especially with first-born children.

A breast-fed infant's nutritional requirements can be entirely met exclusively by breast-feeding during the first six months of life. At this time, solid foods should be

Table 2 Recommended food servings/portion sizes and their nutrient contributions

Food group	Female adult	Pregnant woman	Breast-feeding woman	Main food sources	Principal nutrients
Breads and cereals	3–6	4–5	4–5	Bread, pasta, rice, legumes, cereals, potatoes, etc.	Carbohydrates (complex), vitamins (B group) and fibre
Vegetables	2–3	2–4	2–4	Wide variety based on seasonal availability Include salads daily	Vitamins, minerals, water and fibre
Fruit	2–3	2–3	2–3	Wide variety based on seasonal availability	Vitamins, minerals, water and fibre
Dairy products	2–4	3–4	4–5	Milk, fermented milk products & cheese (low-fat products preferred)	Proteins, fats and calcium
Protein foods	1½–2½	2½	2½	Meat, poultry, fish, eggs Legumes, nuts and cereals	Proteins (of varying biological value) Lipids (of vegetable or animal origin) Vitamin B ₁₂ , iron and fibre
Added fats	3–5	4	4	Preferably olive and/or seed oils	Lipids, vitamin E
Water	>2	4–6	6–8 glasses	Tap and bottled water, herbal teas and non-alcoholic beverages with low sugar content	Water

progressively introduced into the diet, supplemented by breast-milk or infant formula. As the period of lactation may last a significant length of time, it is important for the nursing woman to adequately plan her diet to meet nutritional requirements⁴⁰.

Dietary recommendations

Dietary guidelines for the breast-feeding women encompass principles that also apply towards achieving a balanced diet: variety, balance, as well as being pleasurable and adequate to meet needs. To this end it is recommended to include these basic food groups on a daily basis: grains and cereals, fruits, vegetables, dairy products and protein foods. It is also critical to ensure an adequate state of hydration in the form of healthy beverages to optimise milk production. Table 2 outlines the food groups and daily servings recommended for adult women and breast-feeding mothers.

Food and nutrient equivalents

Dietary recommendations in the form of servings or portions are utilised internationally. This constitutes the most practical system as it takes into account common household measures and allows for establishing equivalents among distinct foods with similar nutrient composition. The Program of Alimentation and Nutrition (PAN 1.0) contains much of this data with specific foods for Spain, which also expresses content in common household measures as well as in grams⁴¹.

Daily meal plans

As in pregnancy, dietary guidelines should also include a series of practical suggestions. These include eating small, frequent meals, with each meal including the maximum

number of food groups. Encouraging nursing women to drink fluids in abundance is also advised, which include water and other healthy beverages. The mother should watch for favourable or adverse reactions after feeding that could be related to her preceding food intake. If she is overweight, the diet should be adapted in such a way that meeting nutritional needs would not be jeopardised. For an underweight mother who has difficulty consuming the recommended intakes, enriched foods or food supplements should be considered, especially in the case of calcium.

Special considerations

Pregnancy and lactation constitute a period of life in which popular beliefs and practices abound, and even though some may have historical explanations that are more or less plausible, others should be demystified and placed in a current context. For example, mothers should be reminded that not one specific food in and of itself increases milk production, but rather the adequate combination of foods in their totality.

It is known that breast-milk can vary in taste, colour and can even affect the infant's digestive function. This is due to the composition of the mother's diet and the inclusion of the following foods: artichokes, onions, asparagus, turnips, leeks, garlic, peppers, vegetables (from the cabbage family) and legumes. However, before automatically eliminating these foods from the diet, it is recommended to observe the infant's reactions after feeding, as responses vary widely and may not even occur. In the case of children who have a family history of allergies, it may be prudent for the mother to avoid foods that are known to be potential allergens such as berries, tropical fruits, chocolate, fatty fish, cow's milk and eggs^{42,43}.

Maternal milk is a mammary secretion and, as such, one

must keep in mind that milk glands eliminate certain substances that may later be excreted in milk. Examples of such substances include alcohol, nicotine and compounds from a variety of medications. Therefore it is prudent to recommend abstaining from alcohol and tobacco, as well as non-prescribed medications, during lactation. For mothers unwilling or unable to stop smoking, breast-feeding is still recommended as its benefits outweigh the disadvantages of nicotine exposure. Finally, it is advisable to limit caffeine and caffeine-containing products to two cups or less per day, as hyperactivity, fussiness and colic have been reported in some infants whose mothers are regular drinkers of caffeine-containing beverages⁴⁴.

The period after lactation

After pregnancy, delivery and lactation, it is recommended to slowly return to one's normal eating pattern as the supplementary nutritional demands produced by these physiological changes are no longer present. Certain habits are worth maintaining, especially the focus on consuming complex carbohydrates, vegetables and fruits, water and the predominance of vegetable versus animal fats. The intake of dairy products and protein foods should be reduced. Very often the periods of pregnancy and breast-feeding are the best times to restructure pre-existing inadequate eating habits. Positive changes would not only benefit the mother but also the rest of the family as well as the newborn, having far-reaching effects into the future: childhood, adolescence and adulthood.

Conclusion

The nutritional status of the breast-feeding woman is of vital importance. However, adequate nutrition clearly begins during pregnancy, the biological cycle that is specific for the accumulation of reserves. This can only be achieved with adequate and personalised dietary counselling which orients food intake to cover nutritional needs specific for each physiological condition. In summary, it is worth pointing out that this solid nutritional base for nursing should be reinforced by the mother's predisposition and attitude, the adequate suckling of the newborn and the support of her partner and/or family. With all of these facilitating conditions, breast-feeding is guaranteed to be a success.

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