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# THE RELEVANCE OF BREASTFEEDING: A SYSTEMATIC REVIEW

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**ABSTRACT**

Human milk is uniquely superior for infant feeding and represents the perfect example of individualization in Pediatrics. Human milk is not a uniform body fluid but a secretion of the mammary gland of changing composition. Foremilk differs from hindmilk, and colostrum is strikingly different from transitional and mature milk. Milk changes with time of day and during the course of lactation. Extensive research has demonstrated health, nutritional, immunologic, developmental, psychological, social, economic and environmental benefits of human milk. Breastfeeding results in improved infant and maternal health outcomes in both the industrialized and developing world. Some specific topics will be discussed such as the preventive effect of human milk on infections, overweight, obesity and diabetes, malignant disease, neurodevelopmental outcomes, reduction of necrotizing enterocolitis. Important health benefits of breastfeeding and lactation are also described for mothers. Finally, contraindications to breastfeeding and supplementation of breastfed infants are presented. Interventions to promote breastfeeding are relatively simple and inexpensive. Infant feeding should not be regarded as a lifestyle choice but rather as a basic health issue.

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# INTRODUCTION

Human milk is species-specific and all substitute feeding preparations differ markedly from it, making human milk uniquely superior for infant feeding (1). Human milk is not a uniform body fluid but a secretion of the mammary gland of changing composition. Foremilk differs from hindmilk, and colostrum is strikingly different from transitional and mature milk. Milk changes with time of day and during the course of lactation. Human milk consists of nutrients, such as proteins, lipids, carbohydrates, minerals, vitamins and trace elements that are of paramount importance to fulfill the nutritional needs of young infants and ensure normal growth and development (2). Compared to bovine milk, human milk comprises less total protein (8-10 g/l), but this is of higher biological value and the proteins of the human milk consist of the right balance of caseins and whey proteins covering nutritional as well as functional needs reflected by a specific postprandial response (3). Human milk of healthy mothers is also characterized by the optimal ratio of n-3 and n-6 long chain polyunsaturated fatty acids (PUFAs). These are constituents of triglycerides and phospholipids, forming complex structures important for

The major carbohydrate in human milk is the disaccharide lactose. In addition to lactose, human milk also contains monosaccharides (mainly glucose and galactose) and over 130 different oligosaccharides. Human milk contains large amounts (10-12 g/l) of neutral and acidic oligosaccharides with complex molecular structures affecting the gut microbiota and the developing immune system, while cow's milk contains only traces (6, 7). Human milk also includes numerous immune-related components such as sIgA, leukocytes, lysozyme, lactoferrin, interferon-γ, nucleotides, cytokines and others. Several of these compounds offer passive protection in the gastrointestinal tract and to some extent in the upper respiratory tract preventing adherence of pathogens to the mucosa and thereby protecting the breastfed infant against invasive infections. Human milk also consists of essential fatty acids, enzymes, hormones, growth factors, polyamines and other biologically active compounds which may play an important role in the health benefits associated with breastfeeding. Human milk has optimal nutritional value and beneficially affects absorption and metabolism, development of the gut microbiota and maturation, risk of infections and allergies, development of the brain and the eye (8). Therefore, human milk is a truly functional food as it does not only provide nutrients, but also bioactive components which offer

both short-term and long-term benefits as regards to health and development (9). Extensive research using improved epidemiologic methods and modern laboratory techniques documents diverse and compelling advantages for infants, mothers, families and society from breastfeeding and use of human milk for infant feeding (10). These advantages include health, nutritional, immunologic, developmental, psychological, social, economic and environmental benefits.

**Infant outcomes:** The positive effects of breastfeeding on the infant and the mother have been noticed in both the developed and the developing countries. In fact, data indicate that breastfeeding can save lives in countries with poor conditions or hygiene. It has been estimated that 1.3 to 1.45 million deaths in 42 high-mortality countries could be prevented by increased levels of breastfeeding (11, 12). In a recent analysis of the health consequences of child undernutrition, it was estimated that suboptimal breastfeeding was responsible for 1.4 million child deaths and 44 million disability-adjusted life years, equivalent to 10% of the disability-adjusted lifeyears in children younger than 5 years (13). The improved health outcomes of breastfeeding in developed countries have been emphasized in studies that compare breastfeeding and infant formula. The most comprehensive publication on this subject that one can refer to is the report titled Breastfeeding and Maternal and Infant Health Outcomes in Developed Countries issued by the Evidence-based Practice Centers of the Agency for the Healthcare Research and Quality (AHRQ) of the US Department of Health Human Services (14, 15).

**Health benefits**: Prevention of infections The preventive effect on infections is by far the most important health benefit in relation to breastfeeding. Human milk feeding decreases the incidence and/or severity of a wide range of infectious diseases. The risk of hospitalization for lower respiratory tract infections in the first year is reduced 72% if infants breastfed exclusively for more than 4 months (14, 16). Infants who exclusively breastfed for 4 to 6 months had a fourfold increase in the risk of pneumonia compared with infants who exclusively breastfed for more than 6 months (17). The severity (duration of hospitalization and oxygen requirements) of respiratory syncytial virus bronchiolitis is reduced by 74% in infants who breastfeed exclusively for 4 months compared with infants who never or only partially breastfed (18). Any breastfeeding compared with exclusive commercial infant formula feeding will reduce the incidence of otitis media (OM) by 23% (14). Also, any breastfeeding is associated with a 64% reduction in the incidence of nonspecific gastrointestinal tract infections, and this effect lasts for 2 months after cessation of breastfeeding (14, 16). Last, human milk has been shown to be protective against necrotizing enterocolitis (NEC) by down-regulating the damaging inflammatory reaction. A recent study comparing preterm infants fed human milk exclusively with those fed human milk supplemented with cow-milk formula showed a 77% decrease in NEC (19).

**Other health outcomes:** Some studies suggest decreased rates of sudden infant death syndrome (SIDS) in the first year of life. Meta-analyses with a clear definition of breastfeeding and adjusted for confounders and other known risks for SIDS note that breastfeeding is associated with a 36% reduced risk of SIDS (14, 20).

**Immune protection:** Regarding allergies, exclusive breastfeeding for 3 to 4 months can result in a lower incidence of asthma, atopic dermatitis and eczema (27% in a low risk population and up to 42% with positive family history) (14). Whatever this protective effect, women with a family history of allergy should breastfeed their infants like everyone else, and, in this targeted population, exclusive breastfeeding is recommended until the age of 6 months. There is a reduction of 52% in the risk of developing celiac disease in infants who were breastfed at the time of gluten exposure (22). In general, there is a connection between increased duration of breastfeeding and reduced risk of celiac disease when measured as the presence of celiac antibodies. Breastfeeding is associated with a 31% reduction in the risk of childhood inflammatory bowel disease. That is considered to be the result of an interaction between the immunoglobulating effect of human milk and the genetic susceptibility of the infant (23).

**Overweight obesity and diabetes:** Numerous studies have investigated whether or not breastfeeding can reduce the risk of obesity. It seems that with any breastfeeding there is a 15% to 30% reduction of obesity rates in adolescence and adulthood. Therefore, the first step of any national campaign aiming to combat obesity should be the support of breastfeeding (14, 26, 27). Some studies also suggest reduction in incidence of insulin – dependent (type 1) (up to 30% for infants who exclusively breastfed for 3 months) and non insulin dependent (type 2) diabetes mellitus (40%, possibly reflecting the long-term positive effect of breastfeeding on weight control and feeding self regulation) (14, 24, 25).

**Malignant disease:** Breast milk may have a role in the prevention of malignant disease by stimulating or modulating the immune response and promoting its development in early life (16). This protection of having been breastfed for 6 months or longer includes a 20% lower risk for acute lymphatic leukemia and a 15% lower risk for acute myeloid leukemia (28).

**Neurodevelopmental outcomes**: Available evidence suggests that breastfeeding may be associated with a small but measurable advantage in cognitive development that persists into adulthood. Although the effect size of cognitive benefits may not be of major importance for an individual, it could provide a significant advantage on a population basis (2).

**Preterm infants:** The evidence demonstrates that breastfeeding is associated with a reduced risk of NEC and sepsis. This indicates that human milk contributes to the development of the preterm infant's immature host defence. The benefits of feeding human milk to preterm infants are realized not only in the neonatal intensive care unit (NICU) but also in the fewer untreated brucellosis. Regarding mothers who have herpes simplex lesions on a breast, their infant may feed from the other breast. Mothers who develop varicella 5 days before through 2 days after delivery should be separated from their infants, but their expressed milk can be used for feeding. In 2009 the CDC recommended that mothers acutely infected with H1N1 influenza should temporarily be isolated from their infants until they are afebrile, but they can provide expressed milk for feeding. It is also not recommended that mothers who are infected with human immunodeficiency virus (HIV) breastfeed their infants (35). Finally, breasfeeding is not advised for mothers who are using drugs of abuse, who are receiving antimetabolites or chemotherapeutic agents or have had exposure to radioactive materials (for as long as there is radioactivity in the milk) (36).

Breastfeeding is not contraindicated for infants born to mothers who are hepatitis B surface antigen-positive, mothers who are infected with hepatitis C virus (persons with hepatitis C virus antibody or hepatits C virus-RNA-positive blood (36) and mothers who are seropositive carriers of cytomegalovirus (CMV) (not recent converters if the infant is term). There is a possibility, though, that CMV acquired from mother's milk may be associated with a late-onset sepsis-like syndrome in the extremely low birth weight (birth weight < 1,500 g) preterm infant. Although not associated with long-term abnormalities, such a syndrome may warrant antiviral therapy (37). Tobacco smoking by mothers is not a contraindication to breastfeeding, but healthcare professionals should advise all tobacco-using mothers to avoid smoking within the home (36). Breastfeeding mothers should avoid the use of alcoholic beverages, because alcohol is concentrated in breast milk and its use can inhibit milk production. An occasional celebratory single, small alcoholic drink is acceptable, but breastfeeding should be avoided for 2 hours after the drink (38). For the great majority of newborns with jaundice and hyperbilirubinemia, breastfeeding can and should be continued without interruption (39). Supplementation of breastfed infants Vitamin D deficiency/insufficiency and rickets has increased in all infants as a result of decreased sunlight exposure secondary to changes in lifestyle, dress habits and use of topical sunscreen preparations. It has been suggested that in order to ensure adequate concentrations of vitamin D, all breastfed infants should receive an oral supplement of vitamin D, 400 U per day, after leaving hospital (40).

Food sources of iron and zinc should be initiated at about 6 months of age. In addition, oral supplementation with iron drops before 6 months may be necessary. When it comes to premature infants, a multivitamin and oral iron supplements are recommended until they have a varied diet and both their growth and hematologic status are satisfactory. Current situation and the challenge Estimates on the prevalence of breastfeeding in Europe were reported in 2003 (41). The rate of any breastfeeding at 6 months was more than 50% in only 6 countries. As for the United States, although breastfeeding initiation rates have increased steadily since 1990, exclusive breastfeeding initiation rates have shown little or no increase over that same period of time. In general, the available data show that breastfeeding rates and practices fall short of those considered desirable by many professional organizations and scientific societies. Therefore, the real challenge is a major conceptual change in the organization of the hospital services for the mother and infant dyad and the implementation of a health policy supporting breastfeeding in order to increase the rate of initiation of breastfeeding as well as the duration of exclusive breastfeeding and partial breastfeeding. WHO and UNICEF have published the "Ten Steps to Successful Breastfeeding" which provide a template for developing a uniform hospital policy for support of breastfeeding (42). According to them, a written breastfeeding policy that is routinely communicated to all health care staff must exist. All health care staff must be trained in the skills necessary to implement this policy. All pregnant women should be informed about the benefits and management of breastfeeding, they should be helped to initiate breastfeeding within the first hour of birth and to maintain lactation even if they are separated from their infants. Also, newborn infants should not be given any food or drink other than breast milk, unless medically indicated. Rooming-in should be practiced to allow mothers and infants to remain together 24 h a day.

No artificial nipples or pacifiers to breastfeeding infants. Breastfeeding should be encouraged on demand and the establishment of breastfeeding support groups, to which mothers must be referred to on discharge from hospital, should be fostered. In 2009, the AAP adopted the Ten Steps program, which has been shown to enhance all aspects of successful breastfeeding such as rates, initiation, duration and exclusivity (42, 43). In the same direction, the Baby-Friendly Hospital Initiative is WHO/UNICEF program that awards Baby Friendly status to hospitals meeting standards of breastfeeding promotion and support outlined in the Ten Steps. The goal of this initiative is to make hospital-wide changes that institutionalize breastfeeding support and promotion. Pediatricians can play an instrumental role in the creation of an optimal breastfeeding environment. They ought to promote breastfeeding as the norm for infant feeding, become knowledgeable in the principles and management of lactation and breastfeeding, develop skills necessary for assessing the adequacy of breastfeeding and support training and education for medical students, residents and postgraduate physicians in breastfeeding and lactation. They should promote hospital policies that are compatible with the WHO/UNICEF "Ten Steps to Successful Breastfeeding", collaborate with the obstetric community to develop optimal breastfeeding support programs and coordinate with community-based health care professionals and certified breastfeeding counselors to ensure uniform and comprehensive breastfeeding support.

**Environmental contaminants**: Exposure to environmental chemicals has become a serious public health issue because of their possible toxic impact. Biomonitoring of breast milk, which is used as an indicator of environmental pollution, reveals residues of organohalogen compounds such as polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and coplanar polychlorinated biphenyls (PCBs), of pesticides like DDT, of other contaminants such as mercury, lead and cadmium and of radioiodine 131 (44, 45). The existence of such chemicals in human milk is a shocking reality and human milk may be compromised by them. However, the detection of any environmental chemical in breast milk does not necessarily mean that there is a serious health risk for breastfed infants. No adverse effect has been clinically or epidemiologically demonstrated as being associated solely with consumption of human milk containing background levels of environmental chemicals (46). Furthermore, it has been shown that breastfeeding can offset the possible harmful effects of exposure to chemicals. In a study by Charnley and Kimbrough the researchers mention that: "Breastfed infants have higher exposures than formula-fed infants, but studies consistently find that breast-fed infants perform better on developmental neurologic tests than their formula-fed counterparts supporting the well-recognized benefits of breast feeding" (47). Also, the concern related to potential danger from intake of excessive mercury or other contaminants is counterbalanced by the neurobehavioral benefits of an adequate DHA intake from human milk and can be significantly reduced by avoiding the intake of large predatory fish. (eg. swordfish and mackerel) (48). In conclusion, health milk is an irreplaceable immunological resource and its health benefits still far outweigh the potential negative effects attributed to the presence of environmental contaminants. It is imperative, though, that the level of contaminants in the environment and the mother's diet should be reduced. The existence of chemical residues in human milk should not be a reason to limit

breastfeeding, but the evidence base for strengthening legislation to phase out or reduce contaminants. Comparing biomonitoring results between countries with and without laws for decreased use of chemicals show great difference. In Europe, for example, the general down ward trend in the level of persistent organic pollutants already indicates a continuing decline in exposure as measures to reduce emissions have been implemented.

**Conclusion**

Research and practice have shown that breastfeeding and human milk can offer significant nutritional and nonnutritional benefits to the infant and the mother and lay the foundations for optimal infant, child and adult health as well as child development. Therefore, the support of breastfeeding should be seriously viewed as a major public health issue. Interventions to reinforce breastfeeding are relatively simple and inexpensive. The enthusiastic support and involvement of pediatricians and system wide-support such as the Baby Friendly Hospital can be effective in promoting breastfeeding. Furthermore, strong legislation should be enacted to review and restrict the use of chemical substances found in breast milk, so that the confidence in this low tech life saver is not undermined in any way.

# REFERENCES


1. Hambraeus, Forsum E, Lönnerdal B. Nutritional aspects of breast milk and cow's milk formulas. In: Hambraeus L, Hanson L, MacFarlane H. Symposium on Food and Immunology. Stockholm: Almqvist and Wiksell,1975.
2. Agostoni C, Braegger C, Decsi T, Kolacek S, Koletzko B, Michaelsen KF, Mihatsch W, Moreno LA, Puntis J, Shamir R, Szajewska H, Turck D, van Goudoever J; ESPGHAN Committee on Nutrition. Breast feeding: A Commentary by the ESPGHAN Committee on Nutrition. J Pediatr Gastroenterol Nutr. 2009;49(1):112-25.
3. Moro G, Minoli I, Boehm G, Georgi G, Jelinek J, Sawatzki G. Postprandial plasma amino acids in preterm infants: influence of the protein source. Acta Paediatr. 1999;88(8):885-9.
4. Harzer G, Haug M, Dieterich I, Gentner PR. Changing patterns of human milk lipids in the course of the lactation and during the day. Am J Clin Nutr. 1983;37(4):612-21.
5. Szabó E, Boehm G, Beermann C, Weyermann M, Brenner H, Rothenbacher D, Decsi T. Fatty acid profile comparison in human milk sampled from the same mothers at the sixth week and the sixth month of lactation. J Pediatr Gastroenterol Nutr. 2010;50(3):316-20.
6. Stahl B, Thurl S, Zeng J, Karas M, Hillenkamp F, Steup M, Sawatzki G. Oligosaccharides from human milk as revealed by matrix-assisted laser desorption/ionization mass spectrometry. Anal Biochem. 1994;223(2):218-26.
7. Boehm G, Stahl B. Oligosaccharides In: Mattila-Sandholm T. Functional dairy products. Cambridge: Woodhead Publishers, 2003.
8. Stahl B. The Relevance of Human Milk Research today. In: 44th Annual Meeting of ESPGHAN, Italy 2011.
9. Lonnerdal B. Breast milk components – effects of maternal diet, genetics and region. In: 44th Annual Meeting of ESPGHAN, Italy 2011.
10. Kramer MS, Chalmers B, Hodnett ED, Sevkovskaya Z, Dzikovich I, Shapiro S, Collet JP, Vanilovich I, Mezen I, Ducruet T, Shishko G, Zubovich V, Mknuik D, Gluchanina E, Dombrovskiy V, Ustinovitch A, Kot T, Bogdanovich N, Ovchinikova L, Helsing E; PROBIT Study Group (Promotion of Breastfeeding Intervention Trial). Promotion of Breastfeeding Intervention Trial (PROBIT): a randomized trial in the Republic of Belarus. JAMA. 2001;285(4):413-20.
11. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS; Bellagio Child Survival Study Group. How many child deaths can we prevent this year? Lancet. 2003;362(9377):65-71.
12. Lauer JA, Betrán AP, Barros AJ, de Onís M. Deaths and years of life lost due to suboptimal breast-feeding among children in the developing world: a global ecological risk assessment. Public Health Nutr. 2006;9(6):673-85
13. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, Mathers C, Rivera J; Maternal and Child Undernutrition Study Group. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet. 2008;371(9608): 243-60.
14. Ip S, Chung M, Raman G, Chew P, Magula N, DeVine D, Trikalinos T, Lau J. Breastfeeding and maternal and infant health outcomes in developing countries. Evid Rep Technol Assess (Full Rep). 2007;(153):1-186.
15. American Academy of Pediatrics, Section on Breastfeeding. Breastfeeding and the use of human milk. Pediatrics. 2012;129(3):e827-41.
16. Ip S, Chung M, Raman G, Trikalinos TA, Lau J. A summary of the Agency for Healthcare Research and Quality's evidence report on breastfeeding in developed countries. Breastfeed Med. 2009;4(Suppl 1):S17-30.
17. Chantry CJ, Howard CR, Auinger P. Full breastfeeding duration and associated decrease in respiratory tract infection in US children. Pediatrics. 2006;117(2):425-32.
18. Quigley MA, Kelly YJ, Sacker A. Breastfeeding and hospitalization for diarrheal and respiratory infection in the United Kingdom Millenium Cohort Study. Pediatrics. 2007;119(4):e837-42.
19. Sullivan S, Schanler RJ, Kim JH, Patel AL, Trawöger R, KiechlKohlendorfer U, Chan GM, Blanco CL, Abrams S, Cotten CM, Laroia N, Ehrenkranz RA, Dudell G, Cristofalo EA, Meier P, Lee ML, Rechtman DJ, Lucas A. An exclusively human milk-based diet is associated with a lower rate of necrotizing enterocolitis than a diet of human milk and bovine milk-based products. J Pediatr. 2010;156(4):562-7.e1.
20. Alm B, Wennergren G, Norvenius SG, Skjaerven R, Lagercrantz H, Helweg-Larsen K, Irgens LM. Breast feeding and the sudden infant death syndrome in Scandinavia, 1992-95. Arch Dis Child. 2002;86(6):400-2.
21. Greer FR, Sicherer SH, Burks AW; American Academy of Pediatrics Committee on Nutrition; American Academy of Pediatrics Section on Allergy and Immunology. Effects of early nutritional interventions on the development of atopic disease in infants and children: the role of maternal dietary restriction, breastfeeding, timing of introduction of complementary foods, and hydrolyzed formulas. Pediatrics. 2008;121(1):183-91.
22. Akobeng AK, Ramanan AV, Buchan I, Heller RF. Effect of breast feeding on risk of coeliac disease: a systematic review and metaanalysis of observational studies. Arch Dis Child. 2006;91(1):39-43.
23. Barclay AR, Russell RK, Wilson ML, Gilmour WH, Satsangi J, Wilson DC. Systematic review: the role of

breastfeeding in the development of pediatric inflammatory bowel disease. J Pediatr. 2009;155(3):421-6.
24. Rosenbauer J, Herzig P, Giani G. Early infant feeding and risk of type 1 diabetes mellitus – a nationwide population-based casecontrol study in pre-school children. Diabetes Metab Res Rev. 2008;24(3):211-22.
25. Das UN. Breastfeeding prevents type 2 diabetes mellitus: but, how and why? Am J Clin Nutr. 2007;85(5):1436-7.
26. Centers for Disease Control and Prevention (CDC). Vital signs: hospital practices to support breastfeeding – United States, 2007 and 2009. MMWR Morb Mortal Wkly Rep. 2011;60(30):1020-5.
27. Owen CG, Martin RM, Whincup PH, Smith GD, Cook DG. Effect of infant feeding on the risk of obesity across the life course: a quantitative review of published evidence. Pediatrics. 2005;115(5):1367-77.
28. Rudant J, Orsi L, Menegaux F, Petit A, Baruchel A, Bertrand Y, Lambilliotte A, Robert A, Michel G, Margueritte G, Tandonnet J, Mechinaud F, Bordigoni P, Hémon D, Clavel J. Childhood acute leukemia, early common infections, and allergy: The ESCALE Study. Am J Epidemiol. 2010;172 (9):1015-27.
29. Furman L, Taylor G, Minich N, Hack M. The effect of maternal milk on neonatal morbidity of very low-birth-weight infants. Arch Pediatr Adolesc Med. 2003;157(1):66-71.
30. Meinzen-Derr J, Poindexter B, Wrage L, Morrow AL, Stoll B, Donovan EF. Role of human milk in extremely low birth weight infants' risk of necrotizing enterocolitis or death. J Perinatol. 2009;29(1):57-62.
31. Labbok MH. Effects of breastfeeding on the mother. Pediatr Clin North Am. 2001;48(1):143-58.
32. Kramer MS, Kakuma R. The optimal duration of exclusive breast feeding: a systematic review. Adv Exp Med Biol. 2004;554:63-77.
33. Agostoni C, Decsi T, Fewtrell M, Goulet O, Kolacek S, Koletzko B, Michaelsen KF, Moreno L, Puntis J, Rigo J, Shamir R, Szajewska H, Turck D, van Goudoever J; ESPGHAN Committee on Nutrition. Compementary feeding: a commentary by the ESPGHAN Committee on Nutrition. J Pediatr Gastroenterol Nutr. 2008;46(1):99-110.
34. Ball TM, Wright AL. Health care cost of formula-feeding in the first year of life. Pediatrics. 1999;103(4 Pt 2):870-6.
35. American Academy of Pediatrics. Human Milk. In: Pickering LK. Red Book: 2003 Report of the Committee on Infectious Diseases. 26th ed. Elk Grove Village, IL: American Academy of Pediatrics, 2003.
36. American Academy of Pediatrics, Committee on Drugs. Transfer of drugs and other chemicals into human milk. Pediatrics. 2001;108(3):776-89.
37. Kurath S, Halwachs-Baumann G, Müller W, Resch B. Transmission of cytomegalovirus via breast milk to the prematurely born infant: a systematic review. Clin Microbiol Infect. 2010;16(8):1172-8.
38. Anderson PO. Alcohol and breastfeeding. J Human Lact. 1995;11:321-3.
39. American Academy of Pediatrics, Subcommittee on Hyperbilirubinemia. Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. Pediatrics. 2004;114(1):297-316.
40. Wagner CL, Greer FR; American Academy of Pediatrics Section on Breastfeeding; American Academy of Pediatrics Committee on Nutrition. Prevention of rickets and vitamin D deficiency in infants, children, and adolescents. Pediatrics. 2008;122(5): 1142-52.
41. Cattaneo A, Yngve A, Koletzko B, Guzman LR; Promotion of Breastfeeding in Europe project. Protection, promotion and support of breast-feeding in Europe: current situation. Public Health Nutr. 2005;8(1):39-46.
42. World Health Organization United Nations Children's Fund. Protecting, Promoting and Supporting Breastfeeding: the Special Role of Maternity Services. Geneva: World Health Organization, 1989.
43. Philipp BL, Merewood A, Miller LW, Chawla N, MurphySmith MM, Gomes JS, Cimo S, Cook JT. Baby-friendly hospital initiative improves breastfeeding initiation rates in a US hospital setting. Pediatrics. 2001;108(3):677-81.
44. Friends of the Earth Europe. Toxic inheritance. 2005. http://www. foeeurope.org/toxic-inheritance-report, last access: September 2012.
45. Van Leeuwen FXR, Malisch R. Results of the third round of the WHO-coordinated exposure study on the levels of PCBs, PCDDs and PCDFs in human milk. Organohalogen Compounds. 2002;56:311-6.
46. World Health Organization. Biomonitoring of human milk for persistent organic pollutants (POPs). 2009. http://www.who.int/ foodsafety/chem/pops_biomonitoring/en/index.html, last access: September 2012.
47. Charnley G, Kimbrough RD. Overview of exposure, toxicity and risks to children from current levels of 2,3,7,8-terachlorodibenzop-dioxin and related compounds in the USA. Food Chem Toxicol. 2006;44(5):601-15.
48. Koletzko B, Cetin I, Brenna JT; Perinatal Lipid Intake Working Group; Child Health Foundation; Diabetic Pregnancy Study Group; European Association of Perinatal Medicine; European Association of Perinatal Medicine; European Society for Clinical Nutrition and Metabolism; European Society for Paediatric Gastroenterology, Hepatology and Nutrition, Committee on Nutrition; International Federation of Placenta Associations; International Society for the Study of Fatty Acids and Lipids. Dietary fat intakes for pregnant and lactating women. Br J Nutr. 2007;98(5):873-7.

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