

OVERVIEW**Purpose**

This literature review establishes an evidence base for policies that limit the impact of formula marketing on mothers' breastfeeding initiation, duration, and exclusivity. The benefits of breastfeeding are well-documented in the literature (see breastfeeding literature review), including improved health outcomes for mother and infant, as well as broader economic and environmental benefits.

Methodology

This review includes findings from academic studies and "grey literature" from prominent public health or advocacy organizations such as the World Health Organization (WHO) or Public Citizen. There was no exclusion criterion around publishing year since important findings have been published over the last three decades as formula marketing has proliferated and evolved. Not included in this review is an abundance of non-peer-reviewed popular literature on this topic (usually as a piece of the wider discussion on increasing breastfeeding rates).

Roadmap

This literature review includes the following sections:

1. Impact of formula on breastfeeding rates
2. Cost of formula
3. Formula marketing in hospitals
4. Formula marketing in doctors' offices and health clinics
5. Limitations of the existing research

Breastfeeding Rates and the Effect of Marketing Efforts by Formula Companies

Breastfeeding rates in the US are suboptimal and the literature explores the ways in which increasingly aggressive and prevalent formula marketing impacts these rates.

- *Six months exclusive breastfeeding*: All major medical organizations recommend exclusive breastfeeding for the first six months, followed by continued breastfeeding for the first year and beyond, with the gradual introduction of appropriate complementary foods to the infant's diet beginning around six months of age.¹²³⁴⁵ Yet the CDC's Breastfeeding Report Card finds that, of infants born in 2011, only 49% were breastfeeding at 6 months.⁶
- *Increasing marketing aggressiveness and saturation*: In the 80s, formula marketing shifted from "ethical" promotion (so-called because of the focus on gaining a physician-to-parent recommendation for a brand of infant formula) to increasing levels of direct-to-consumer promotion.⁷ Analysis of infant formula magazine advertisements from 2007 to 2012, for example, established a high proportion of advertisements per page in two popular US parenting magazines, and observed a significant increase in infant formula advertisement prevalence beginning in 2009.⁸

- *Targeted audience:* Although formula manufacturers agree that breastfeeding is best, they market infant formula as an alternative for mothers who do not exclusively breastfeed.⁹
- *Specialized product marketing:* As the US birth rate levels off, growth in the domestic infant formula market is primarily being driven by price increases rather than by increased volume of sales. Formula manufacturers have responded by creating new, higher-priced product lines and additives with specific health claims, such as special formulations for “fussy babies” or “gas.”¹⁰
- *Social media marketing:* Infant formula manufacturers have established a social media presence primarily through Facebook pages, interactive features on their own Web sites, mobile apps for new and expecting parents, YouTube videos, sponsored reviews on parenting blogs, and other financial relationships with parenting blogs. Violations of the World Health Organization’s International Code of Marketing of Breast-milk Substitutes (the Code) as well as promotional practices unforeseen by the Code were identified. These practices included enabling user-generated content that promotes the use of infant formula, financial relationships between manufacturers and bloggers, and creation of mobile apps for use by parents. An additional concern identified for Code enforcement is lack of transparency in social media-based marketing.¹¹

Formula marketing, especially in the form of free samples to new mothers at hospitals, has been shown to decrease rates of breastfeeding. And although it is less examined in the literature, research indicates that formula marketing particularly harms the breastfeeding rates of vulnerable or underserved women.

- *Influence on expecting mothers:* Most women decide how they will feed their baby by the last trimester of pregnancy and information given during prenatal care is influential.¹² The literature demonstrates that advertising and provider attitudes impact women’s choice of infant-feeding methods.
- *Decreased confidence:* Formula marketing decreases mothers’ confidence in their ability to breastfeed, especially when the marketing is provided by health care practitioners and institutions. Participants in a 2013 study reported that formula advertisements conveyed an expectation of failure with breastfeeding, and that formula is a solution to fussiness, spitting up, and other normal infant behaviors. Participants reported that the advertisements were confusing in terms of how formula-feeding is superior, inferior, or the same as breastfeeding. This confusion was exacerbated by an awareness of distribution by health care practitioners and institutions, suggesting provider endorsement of infant formula.¹³
- *Print and websites:* A 2013 study found that mothers exposed to print or online formula information are more likely to intend to use formula or to intend to use formula earlier, and are less likely to initiate breastfeeding.¹⁴
- *Toddler milk advertisement:* Advertisements for toddler milk appear to function as indirect advertising for infant and follow-on formula. Women surveyed in a 2010 study responded that they clearly understood toddler milk advertisements to be promoting a range of products that included infant and follow-on formula and accepted their claims uncritically (even though these claims contradicted public health messages about breastfeeding and health risks associated with formula feeding).¹⁵
- *Vulnerable populations:* A 1983 randomized study found that mothers who received a formula sample packet upon hospital discharge were less likely to still be breastfeeding at one month and more likely to have introduced solid foods by two months. These trends became more

significant in three vulnerable subgroups: less educated mothers, women in their first pregnancy, and mothers who had been ill postpartum.¹⁶

Cost of Formula

Although formula was originally produced for infants who did not have access to breast milk, formula is now hygienically produced, widely known, and marketed to almost all women. Today, infant formula is a large and profitable industry.

- *Few players in large market:* A 2011 report from the USDA Economic Research Service found that in 2007, the infant formula market accounted for \$3.5 billion in sales. And in 2008, just three companies made up 98 percent of the market share: Abbott (Similac) at 43 percent, Mead Johnson (Enfamil) at 40 percent, and Nestle (Gerber Good Start) at 15 percent.¹⁷
- *Significant expenditures on marketing:* A 2006 GAO report also found that as of 2004, annual formula company expenditures for TV, print, and radio ads amounted to \$46 million.⁹

Increasing the rates of breastfeeding has been shown to benefit the overall US economy and individual families.

- *Savings to US economy:* A 2010 study found that if 90 percent of families in the United States breastfed babies exclusively for six months, savings to the economy could amount to \$13 billion. If 80 percent of families met the six month exclusive breastfeeding goal, \$10.5 billion could be saved. The study conducted cost analysis (including direct and indirect costs) on all pediatric diseases for which the Agency for Healthcare Research and Quality reported risk ratios that favored breastfeeding.¹⁸

Families also benefit from not spending on formula, as well as the potential healthcare and productivity costs that may stem from not breastfeeding.

- *Lost savings for families:* A 2006 GAO report states that the USDA has calculated a minimum of \$3.6 billion savings in health care costs and indirect costs, such as parents' lost wages, if breastfeeding increased to meet these Healthy People goals.⁹ Based on the price of formula at Walgreens.com in November 2011 and average consumption of 30 oz. of formula per day, Public Citizen found that breastfeeding saves families the costs of formula (\$800 to \$2800 per year).¹⁹
- *Lost savings due to discharge packs:* A 1985 study found that brand name formulas that are distributed in hospital "discharge bags" are up to 66 percent more expensive than store brands. Despite this, mothers who start using one brand of formula are likely to stick with it in the long run.²⁰ According to the Ban the Bags toolkit, if mothers continue using the brand name formulas given for "free" in discharge bags, it will cost at least \$700 extra per year.²¹ A 2013 study found that marketing formula through health professionals may also decrease mothers' willingness to switch formula to a less costly brand.²²

Formula Marketing in Hospitals

Formula marketing in hospitals is still widespread, especially in the form of commercial discharge bags containing free samples of infant formula. New mothers who receive these samples are more likely to stop breastfeeding sooner than those who don't receive these samples.

- *Influence of hospital modeling*: A 1985 study found that the hospital staff and routines exerted a stronger influence on mothers' infant-feeding practices by nonverbal teaching (the hospital "modeling" of infant formula products) than by verbal teaching (counseling supporting breast-feeding).²⁰
- *Breast pumps in discharge packs*: One easily implemented, low-cost intervention to increase breastfeeding is including a breast pump in discharge packages. A 1992 study found that women who received a discharge pack containing a breast pump and no infant formula continued exclusive breast-feeding for longer than women whose discharge pack included formula.²³
- *Shortened exclusive breastfeeding*: Oregon Pregnancy Risk Assessment Monitoring System (PRAMS) data, analyzed in a 2008 study, found that almost two thirds of women who initiated breastfeeding in the hospital reported having been given discharge packs by hospital staff. These women were more likely to have a shorter period of exclusive breastfeeding.²⁴ In a 1992 study, gift packs given to low-income Hispanic mothers were associated with decrease in exclusive breastfeeding during the first three weeks postpartum.²⁵
- *Shortened non-exclusive breastfeeding*: A 2000 review of nine randomized controlled trials found that giving commercial hospital discharge packs (with or without formula) reduces the number of women exclusively breastfeeding at all times but has no significant effect upon whether mothers will terminate non-exclusive breastfeeding any earlier.²³
- *Non-exclusive and exclusive breastfeeding*: A 1996 study found that women breastfed longer when they did not receive formula in the hospital, were not given discharge packs containing formula and/or coupons, and roomed-in more than 60 percent of the time.²⁶ Contrary to the findings of most of the literature, a 1997 randomized clinical trial found that the content of the hospital discharge package (formula and breast pump, versus only breast pump) did not affect whether the mother engaged in exclusive or non-exclusive breast-feeding.²⁷ Another study from 2013 found no significant correlations between formula samples (from the hospital, physician's office, or mail) and exclusive or non-exclusive breast-feeding at one month.²⁸

Hospitals are responding to pressure to limit formula marketing, especially in the form of free samples to mothers who have just given birth. Although far from universally adopted, ending formula marketing in hospitals is gaining increasing acceptance as best practice in hospitals where women give birth.

- *Changing practices*: A 2013 report from Public Citizen and Ban the Bags found that the vast majority of the U.S. News and World Report's 2013-14 "Best Hospitals" have ended or substantially limited formula marketing to new mothers. Most of these top-ranked hospitals have stopped distributing formula company-sponsored discharge bags with formula samples, the most common form of formula marketing.²⁹
- *Fewer discharge packs*: The CDC's 2009 National Survey of Maternity Care Practices in Infant Nutrition and Care found that only 34.2 percent of all hospitals do not give patients infant formula discharge packs. Of this subgroup, 91.5 percent of birth centers do not distribute these discharge packs, contrasted with only 26.1 percent of private hospitals and 28 percent of government hospitals.³⁰

Formula Marketing in Doctors' Offices and Health Clinics

Many healthcare providers allow formula samples and other marketing materials to reach patients visiting their offices.

- *Marketing in prenatal practice settings:* A 2006 study of obstetric care providers in Iowa found that free formula samples and pamphlets on formula samples were readily available in 73 percent of family practitioner offices, 54 percent of OB/GYN offices, and 36 percent of nurse midwife offices, concluding that little promotion of breastfeeding occurs in most prenatal practice settings.³¹
- *Marketing in physician offices:* Surveying physician office practices in 1997 showed that the majority of offices accepted and routinely distributed publications and products that do not "protect, promote, and support" breastfeeding. Many of these publications actually contained outdated recommendations about breastfeeding and some outright contravened the Code. And although those offices with policies in place were less likely to distribute commercial pamphlets, few offices actually set policy for selecting infant feeding resources.³²

Breastfeeding duration and exclusivity are reduced when samples and other formula industry marketing materials are distributed in doctors' offices.

- *Decreased rates of breastfeeding:* A 2000 randomized study found that women who receive formula company materials have been found to be more likely to stop breastfeeding before hospital discharge and before two weeks (although it was not found to impact breastfeeding initiation or long-term duration.) Subgroup analysis found that women with uncertain goals or who set shorter goals for breastfeeding exclusivity were particularly affected by the presence of formula industry materials at prenatal visits.³³

Formula Marketing in WIC

Formula marketing does effectively reach WIC mothers, who are major consumers of infant formula, partly due to widespread state noncompliance with rules against using the WIC trademark in promotional materials.

- *Marketing through WIC:* A 2006 GAO report found that while WIC and non-WIC breastfeeding rates fell short of most national goals, rates were substantially lower for WIC infants. Although formula marketing targets non-WIC mothers, it also reaches WIC mothers. Some of these marketing efforts use the trademarked WIC acronym in promotional materials. Although the USDA's Food and Nutrition Service (FNS) requires states to restrict this practice in their WIC contracts, most states do not.⁹
- *Lower breastfeeding rates in WIC:* A majority of studies looking at free formula samples at hospital discharge found lower breastfeeding rates among both WIC and non-WIC mothers.⁹ Prenatal WIC participation is associated with a greater likelihood of providing babies infant formula rather than breast milk after birth.³⁴

WIC is the nation's largest purchaser of formula, accounting for 60 percent of total sales,¹⁰ and provides free formula to enrolled mothers. WIC's rebate system also creates a conflict of interest between the program and formula companies.

- *WIC rebates and formula marketing:* Although breastfeeding promotion is part of WIC's mandated work, formula companies have leveraged WIC as a promotional vehicle. To contain costs, federal law requires state WIC programs to procure infant formula using a competitive

bidding system, awarding a sole-source contract to the firm offering the lowest net price (wholesale price minus the rebate bid). The rebate money (typically about 85 percent of the wholesale price, which reduces WIC food costs by about \$2 billion a year)¹⁰ constitutes a substantial portion of WIC's budget. This money can only be used to expand the program's reach, which also dovetails with companies' interest in reaching broader consumer base of potential formula purchasers.¹²

- *Decreasing savings:* Although the rebate system currently allows WIC to serve an additional two million participants, the increased price that the formula industry imposes on "new" products has begun to erode the savings that this procurement system has historically achieved.¹⁰
- *Confusion among WIC participants:* The California WIC Association published a report stating that new formula marketing undermines participants' understanding of the superiority of breastfeeding by increasingly positioning formula as equivalent to breast milk. This kind of marketing causes confusion among WIC participants using infant formula about whether WIC provides "breast milk in a can."¹⁰
- *Marketing violations:* In each state, one formula manufacturer gives WIC significant price rebates in exchange for exclusive rights to provide its brand of formula to all WIC participants in the state. Many states go further and violate the USDA's Food and Nutrition Service restrictions by allowing formula manufacturers to use the trademarked WIC acronym in their printed materials, who often specify implied WIC endorsements of products as "WIC approved" and/or "WIC eligible."¹²
- *Equity in WIC:* WIC is intended to serve low-income women, infants, and children who are at nutritional risk, and reaches almost half of all US infants. It widely supplies participants with free formula despite the evidence base showing, with limited exceptions, breast milk has been shown to be nutritionally superior to formula. Given that WIC provides more than half of the formula that is used in the US but serves less than half the infants, WIC infants are more likely to get formula than those not in WIC. This means that low-income infants, who already face low breastfeeding rates, are disproportionately targeted through the government to use infant formula.

Gaps in the Literature

There is a wide range of literature analyzing the effects of formula marketing on new mothers, much of it focused on hospital discharge samples. There are opportunities for additional studies with broader marketing practice research, population diversity, and more rigorous methodology.

- *Consistent modeling at hospitals:* Research has found that hospital "modeling" of the use of formula had greater influence on mothers than did verbal instruction that discouraged formula use.²⁰ Future studies might explore the effectiveness of new ways of supporting mothers who desire to breastfeed by designing innovative hospital routines to model breastfeeding rather than feeding by infant formula.
- *Discharge packs*
 - *Systemic review of hospital discharge packs:* Since the early 1980s, there have been many studies, of varying quality and conclusions, and of fairly different populations, on the impact of discharge packs on breastfeeding. A systemic review of them all would help add clarity to the literature. This would be especially helpful to contextualize the

minority of studies that have indicated no statistical association between breastfeeding duration and discharge packs.²⁷²⁸

- *“Freebie” appreciation in discharge packs:* Some studies grouped women into those who received discharge packs and those who did not. Because of the popularity of the discharge packs (often formula company-produced diaper bags containing infant-feeding information and formula samples as well as similar pregnancy information to all obstetric patients at their first prenatal visit),³³ participants in any future study should receive packs of similar subject content, monetary value, and aesthetic appeal. This would eliminate the formula promotion element but preserve the enjoyment from gaining new baby supplies and information.
- *Other forms of formula marketing:* While the literature is fairly settled that mothers who receive formula samples in hospital are less likely to breastfeed exclusively and more likely to breastfeed for shorter durations, it is still unclear how other forms of advertising (e.g., television ads, formula coupons, or commercially produced literature on infant feeding) impact breastfeeding rates.
- *Variation in measuring breastfeeding rates and intent:* Studies range in how they measure rates of breastfeeding, including different periods of duration and exclusivity. Many do not specify whether the mothers used breast pumps, or what role breast pumps play (especially when given as alternatives to formula samples at discharge) in increasing breastfeeding rates. Some do not state whether the mothers intended to breastfeed before encountering formula marketing.
- *Need for more diverse subjects:* Although studies have analyzed breastfeeding rates for underserved groups such as low-income Hispanic women²⁵, more information is needed to understand how they compare to peer groups and how interventions can be more equitably targeted. Future studies are needed with greater socioeconomic and racial diversity in the study population. Women with uncertain or relatively short breast-feeding goals may be even more prevalent in populations such as low-income women or women with lower educational attainment.³⁵

Works cited

1. Lawrence M. Gartner Jane Morton, MD, Ruth A. Lawrence, MD, Audrey J. Naylor, MD, DrPH, Donna O'Hare, MD, Richard J. Schanler, MD, Arthur I. Eidelman MD. Breastfeeding and the Use of Human Milk. *Pediatrics*. 2005;115:496-506.
2. Breastfeeding, Family Physicians Supporting (Position Paper) -- AAFP Policies. <http://www.aafp.org/about/policies/all/breastfeeding-support.html#Appendix> 4: AAFP Policies Related to Breastfeeding. Accessed December 16, 2014.
3. Statements ABM. Position on breastfeeding. *Breastfeed Med*. 2008;3(4):267-270. doi:10.1089/bfm.2008.9988.
4. The Surgeon General's Call to Action to Support Breastfeeding. <http://www.surgeongeneral.gov/library/calls/breastfeeding/calltoactiontosupportbreastfeeding.pdf>. Accessed October 23, 2014.
5. Global Strategy for Infant and Young Child.
6. CDC. Breastfeeding Report Card. 2014.
7. Cutler BD, Wright RF. The U.S. infant formula industry: is direct-to-consumer advertising unethical or inevitable? *Health Mark Q*. 2002;19(3):39-55. doi:10.1300/J026v19n03_04.
8. Basch CH, Shaffer EJ, Hammond R, Rajan S. Prevalence of infant formula advertisements in parenting magazines over a 5-year span. *J Pediatr Nurs*. 28(6):e28-e32. doi:10.1016/j.pedn.2013.07.001.
9. GAO. BREASTFEEDING Some Strategies Used to Market Infant Formula May Discourage Breastfeeding; State Contracts Should Better Protect against Misuse of WIC Name. 2006;(February).
10. California WIC Association. Concerns About Infant Formula Marketing and Additives. 2010.
11. Abrahams SW. Milk and social media: online communities and the International Code of Marketing of Breast-milk Substitutes. *J Hum Lact*. 2012;28(3):400-406. doi:10.1177/0890334412447080.
12. Kaplan DL, Graff KM. Marketing breastfeeding--reversing corporate influence on infant feeding practices. *J Urban Health*. 2008;85(4):486-504. doi:10.1007/s11524-008-9279-6.
13. Parry K, Taylor E, Hall-Dardess P, Walker M, Labbok M. Understanding women's interpretations of infant formula advertising. *Birth*. 2013;40(2):115-124. doi:10.1111/birt.12044.

14. Zhang Y, Carlton E, Fein SB. The association of prenatal media marketing exposure recall with breastfeeding intentions, initiation, and duration. *J Hum Lact*. 2013;29(4):500-509. doi:10.1177/0890334413487256.
15. Berry NJ, Jones S, Iverson D. It's all formula to me: women's understandings of toddler milk ads. *Breastfeed Rev*. 2010;18(1):21-30. <http://www.ncbi.nlm.nih.gov/pubmed/20443436>. Accessed December 13, 2014.
16. Bergevin Y, Dougherty C, Kramer MS. Do infant formula samples shorten the duration of breastfeeding? *Lancet*. 1983;1(8334):1148-1151. <http://www.ncbi.nlm.nih.gov/pubmed/6133166>. Accessed December 17, 2014.
17. Oliveira V, Smallwood D. WIC Contract Brand. 2011;(124).
18. Bartick M, Reinhold A. The burden of suboptimal breastfeeding in the United States: a pediatric cost analysis. *Pediatrics*. 2010;125(5):e1048-e1056. doi:10.1542/peds.2009-1616.
19. Public Citizen. Infant Formula Marketing in Healthcare Facilities. <http://www.citizen.org/Page.aspx?pid=5383>. Accessed December 16, 2014.
20. Reiff MI, Essock-Vitale SM. Hospital influences on early infant-feeding practices. *Pediatrics*. 1985;76(6):872-879. <http://www.ncbi.nlm.nih.gov/pubmed/4069855>. Accessed December 16, 2014.
21. Ban the Bags Tool Kit. :1-17.
22. Huang Y, Labiner-Wolfe J, Huang H, Choiniere CJ, Fein SB. Association of health profession and direct-to-consumer marketing with infant formula choice and switching. *Birth*. 2013;40(1):24-31. doi:10.1111/birt.12025.
23. Donnelly A, Snowden HM, Renfrew MJ, Woolridge MW. Commercial hospital discharge packs for breastfeeding women. *Cochrane database Syst Rev*. 2000;(2):CD002075. doi:10.1002/14651858.CD002075.
24. Rosenberg KD, Eastham C a, Kasehagen LJ, Sandoval AP. Marketing infant formula through hospitals: the impact of commercial hospital discharge packs on breastfeeding. *Am J Public Health*. 2008;98(2):290-295. doi:10.2105/AJPH.2006.103218.
25. Snell BJ, Krantz M, Keeton R, Delgado K, Peckham C. The association of formula samples given at hospital discharge with the early duration of breastfeeding. *J Hum Lact*. 1992;8(2):67-72. <http://www.ncbi.nlm.nih.gov/pubmed/1605843>. Accessed December 17, 2014.
26. Wright A, Rice S, Wells S. Changing Hospital Practices to Increase the Duration of Breastfeeding. *Pediatrics*. 1996;97(5):669-675. <http://pediatrics.aappublications.org/content/97/5/669>. Accessed December 17, 2014.

27. Dungy CI. Hospital Infant Formula Discharge Packages. *Arch Pediatr Adolesc Med.* 1997;151(7):724. doi:10.1001/archpedi.1997.02170440086015.
28. Thurston A, Bolin JH, Chezem JC. Infant formula samples: perinatal sources and breast-feeding outcomes at 1 month postpartum. *J Perinat Neonatal Nurs.* 27(4):353-358. doi:10.1097/JPN.0b013e3182a99e7a.
29. Public Citizen. Top Hospitals' Formula for Success: No Marketing of Infant Formula.
30. CDC National Survey of Maternity Practices in Infant Nutrition and Care (mPINC)–2009. 2009. http://www.cdc.gov/breastfeeding/data/mpinc/data/2009/tables5_1a-5_2a.htm.
31. Dusdieker LB, Dungy CI, Losch ME. Prenatal office practices regarding infant feeding choices. *Clin Pediatr (Phila).* 2006;45(9):841-845. doi:10.1177/0009922806294220.
32. Valaitis RK, Sheeshka JD, O'Brien MF. Do consumer infant feeding publications and products available in physicians' offices protect, promote, and support breastfeeding? *J Hum Lact.* 1997;13(3):203-208. <http://www.ncbi.nlm.nih.gov/pubmed/9341412>. Accessed December 17, 2014.
33. Weitzman M. Office Prenatal Formula Advertising and Its Effect on Breast-Feeding Patterns. *Pediatrics.* 1997;99(3):296-303.
34. Ziol-Guest KM, Hernandez DC. First- and second-trimester WIC participation is associated with lower rates of breastfeeding and early introduction of cow's milk during infancy. *J Am Diet Assoc.* 2010;110(5):702-709. doi:10.1016/j.jada.2010.02.013.
35. Ryan AS, Zhou W. Lower breastfeeding rates persist among the Special Supplemental Nutrition Program for Women, Infants, and Children participants, 1978-2003. *Pediatrics.* 2006;117(4):1136-1146. doi:10.1542/peds.2005-1555.