

Opinion

Pros and Cons of Donor Breast Milk Versus Formula Milk for Premature and LBW Babies

Vernando Yanry Lameky^{1,*}, Nastain Abubakar Pattimura² and Bazrul Makatita²¹Jurusan Keperawatan, Universitas Kristen Indonesia Maluku, Indonesia²Jurusan Keperawatan, STIKes Pasapua Ambon, Indonesia**Article history**

Received: 07 May 2024

Revised: 08 June 2024

Accepted: 09 June 2024

Published Online: 29 June 2024

***Correspondence:**

Vernando Yanry Lameky

Address: Jurusan Keperawatan, Universitas Kristen Indonesia Maluku 97129, Indonesia.

Email: deanvanesa23@gmail.com**How to cite this article:** Lameky VY, Pattimura NA, Makatita B. Pros and Cons of Donor Breast Milk Versus Formula Milk for Premature and LBW Babies. *Health Dynamics*, 2024, 1(6), 187-190. <https://doi.org/10.33846/hd10602>**Copyrights:** © 2024 by the authors. This is an open access article under the terms and conditions of the Creative Commons Attribution – NoDerivatives 4.0 International (CC BY-ND 4.0) license (<https://creativecommons.org/licenses/by-nd/4.0/>).**ABSTRACT**

Feeding premature and low birth weight (LBW) babies requires careful consideration due to their heightened vulnerability. Donor breast milk offers essential nutrients, antibodies, and beneficial bacteria, reducing the risk of infections and promoting healthy gut microbiota. However, accessibility and cost constraints pose challenges for many families. Formula milk provides a convenient alternative but lacks the immune-boosting properties of breast milk and may increase the risk of digestive problems and metabolic diseases later in life. Informed decision-making is crucial, considering both short-term benefits and long-term risks. Further research and support are needed to ensure optimal nutrition for premature and LBW babies, empowering parents and healthcare providers alike.

Keywords: Premature babies; low birth weight babies; donor breast milk; formula milk

INTRODUCTION

Premature babies and low birth weight (LBW) babies can be caused by various factors, including maternal health conditions, multiple pregnancies, and environmental factors.⁽¹⁾ Despite advances in technology and medical care, premature and LBW babies still have a higher risk of experiencing health problems and developmental delays.⁽²⁾ Proper nutrition plays an important role in the growth and development of premature and LBW babies, especially the nutritional needs that must be met to promote healthy weight and overall well-being. Breast milk is often recommended as the best source of nutrition for premature and LBW babies, as it provides essential nutrients and antibodies that can help protect against infection.⁽³⁾ If breastfeeding is not possible, special formula milk can be used to ensure the baby receives the nutrients necessary for growth and development.⁽⁴⁾ In addition, some premature babies require additional nutrition through a feeding tube or intravenous fluids to meet their increased energy and nutritional needs.⁽⁵⁾ Premature babies have a higher risk of malnutrition and growth problems, so healthcare providers need to monitor their diet and growth closely.

Special formula milk or breast milk is needed to meet the specific needs of premature babies, and adjustments are made as the baby grows and develops.⁽⁶⁾ Close collaboration between healthcare providers, parents, and nutritionists

is essential to ensure premature babies receive the best nutrition to support their growth and development.⁽⁶⁾ In choosing between donor breast milk and formula milk for premature babies, special nutritional needs and directions from the health care provider must be taken into account.

ADVANTAGES OF DONOR BREAST MILK

Donor breast milk is the best choice for providing nutrition to premature babies because its nutritional content is rich in protein, fat and vitamins. More than just a substitute for formula, donor breast milk contains antibodies that protect premature babies from infection and disease and reduce the risk of complications in the vulnerable early stages of life. Research showed that premature babies who received donor breast milk had a lower risk of necrotizing enterocolitis, a serious intestinal condition that can be life-threatening.⁽⁷⁾ Therefore, donor breast milk has a significant impact on the health of premature babies, confirming the importance of breast milk in neonatal care.

In addition to providing essential nutrients, donor breast milk also supports the development of healthy gut microbiota. Gut microbiota plays an important role in digestion, nutrient absorption, and immunity.⁽⁸⁾ By providing donor breast milk which is rich in various beneficial bacteria, it can support the formation of optimal gut microbiota in premature babies. Not only does this help reduce the risk of infections and complications, but it is also associated with better long-term health, including a reduced risk of chronic disease later in life. Therefore, donor breast milk provides important benefits for the health and development of premature babies, not only in terms of nutrition.⁽⁹⁾ Premature babies who receive donor breast milk have lower rates of sepsis and infection compared to babies who receive formula milk.⁽⁹⁾ This is important to prevent serious complications and long hospital stays and to reduce the risk of necrotizing enterocolitis.⁽¹⁰⁾ Research in neonatal intensive care units shows that donor breast milk can significantly reduce sepsis and necrotizing enterocolitis compared with formula milk.⁽¹¹⁾

CHALLENGES AND LIMITATIONS OF DONOR BREAST MILK

Premature babies who receive donor breast milk have shorter hospital stays and lower rates of chronic lung disease compared to babies who receive formula milk.⁽¹²⁾ The immune-boosting properties of breast milk have also been proven to reduce the risk of infection in premature babies, having a positive impact on overall health. One of the challenges many parents of premature babies face is the availability and accessibility of donor breast milk. Even though breast milk has many benefits, not all mothers can produce sufficient amounts of breast milk due to various factors such as stress, illness, or medical conditions.⁽¹³⁾ The high cost of donor breast milk can be a significant burden for families experiencing financial difficulties.⁽¹⁴⁾

These conditions can force families to make difficult decisions regarding child care, which can ultimately compromise health outcomes. To overcome these challenges, more support and resources need to be allocated to ensure equitable access to donor breast milk for all premature babies who need it.^(15,16)

ADVANTAGES OF FORMULA

Formula milk provides a convenient alternative for parents who do not have access to donor breast milk or cannot produce breast milk in sufficient quantities to meet the special needs of premature babies. Its ease of use is a practical solution for busy parents, especially those returning to full-time work, as there is no need to pump or breastfeed on demand.⁽¹⁷⁾ This is a useful solution for parents who have premature babies who require special attention and a feeding schedule that is not easily achieved through breastfeeding.

Apart from its ease of use, formula milk provides flexibility in the feeding schedule.⁽¹³⁾ With formula, parents can easily prepare bottles in advance or on the go, allowing for shared feeding responsibilities and facilitating consistent attendance. The availability of formula milk at nearby stores or pharmacies makes it a suitable option for families who do not have access to donor breast milk or face medical challenges with breastfeeding.

In addition, one of the advantages of giving formula milk is the lower risk of contamination compared to using donor breast milk.⁽¹⁸⁾ The formula is produced in sterile conditions and can be safely

prepared according to the instructions on the package, providing peace of mind for parents who are concerned about the safety of their baby's food. This is especially important for mothers who cannot breastfeed and want to avoid the risk of contamination of donor breast milk. By using formula milk, you can be assured that your baby is getting safe and reliable nutrition without the risk of contamination.

CHALLENGES AND LIMITATIONS OF FORMULA

The lack of antibodies and other beneficial components found in breast milk can potentially weaken the baby's immune system and increase the risk of infection and disease. Breast milk contains antibodies and other beneficial components that help protect babies from disease and promote overall health and development. On the other hand, formula milk does not provide the same benefits, making it a less-than-optimal choice for some parents. Additionally, the cost of formula milk can be expensive, especially for families on a limited budget. It can create a financial burden for parents who may already be struggling to make ends meet.

Formula feeding has been linked to an increased risk of digestive problems and allergies in babies because it does not contain the same antibodies and immune-boosting properties as breast milk. Research shows that babies who are given formula milk experience more conditions such as colic, constipation and food allergies compared to babies who are given breast milk.⁽¹⁹⁾ This can be a worry for parents who want to ensure their baby's overall health and well-being.

Research also shows that formula-fed babies may have an increased risk of developing metabolic diseases later in life, such as obesity, type 2 diabetes, and cardiovascular disease.⁽²⁰⁾ This is due to the difference in nutritional composition between breast milk and formula milk and the potential long-term effects of formula milk on metabolism and hormone regulation. Therefore, parents need to consider these potential risks when deciding on the best feeding options for their baby's long-term health.

CONCLUSION

These findings highlight the importance of proper nutrition for premature and low birth weight

(LBW) babies to support their growth and development. Donor breast milk is the best choice because it is rich in nutrients and protective antibodies, significantly reducing the risk of necrotizing enterocolitis, sepsis, and other infections. However, the availability and high cost of donor breast milk present challenges that need to be overcome to ensure equitable access for all premature infants.

Formula milk offers a practical and accessible alternative, especially for parents who cannot produce enough breast milk or do not have access to donor breast milk. Despite its convenience and lower risk of contamination, the formula does not have the immune-boosting properties of breast milk. It may pose a higher risk of long-term digestive problems, allergies, and metabolic diseases. These potential drawbacks underscore the importance of making informed decisions regarding infant nutrition and the need for ongoing research to optimize formula composition.

Healthcare providers, parents, and nutritionists must work together to design a nutritional plan that meets the specific needs of each premature infant, thereby ensuring short- and long-term health outcomes. Policymakers and healthcare systems should prioritize initiatives that increase the availability and affordability of donor breast milk, such as funding human milk banks and providing financial support to families in need. By addressing these challenges and supporting informed decision-making, we can improve the health and development of premature and low birth weight infants, ultimately improving their quality of life and reducing healthcare costs associated with long-term complications.

Funding Information

No funds received for this study.

Conflict of Interest

The authors declare no conflict of interest.

REFERENCES

1. Stylianou-Riga P, Kouis P, Kinni P, Rigas A, Papadouri T, Yiallourous PK, et al. Maternal socioeconomic factors and the risk of premature birth and low birth weight in cyprus: a case-control study. *Reprod Health*. 2018;15(1):1–8. <https://doi.org/10.1186/s12978-018-0603-7>
2. Matute SED, Pinos CAS, Tupiza SM, Brunherotti MAA, Martinez EZ. Maternal and neonatal variables associated with premature birth and low birth weight in a tertiary

- hospital in Ecuador. *Midwifery*. 2022;109:103332. <https://doi.org/10.1016/j.midw.2022.103332>
3. Sánchez C, Franco L, Regal P, Lamas A, Cepeda A, Fente C. Breast Milk: A Source of Functional Compounds with Potential Application in Nutrition and Therapy. *Nutrients*. 2021;13(3):1026. <https://doi.org/10.3390/nu13031026>
 4. Martin CR, Ling PR, Blackburn GL. Review of Infant Feeding: Key Features of Breast Milk and Infant Formula. *Nutrients*. 2016;8(5):279. <https://doi.org/10.3390/nu8050279>
 5. Su BH. Optimizing Nutrition in Preterm Infants. *Pediatr Neonatol*. 2014;55(1):5–13. <https://doi.org/10.1016/j.pedneo.2013.07.003>
 6. Chowdhury R, Manapurath R, Sandøy IF, Upadhyay RP, Dhabhai N, Shaikh S, et al. Impact of an integrated health, nutrition, and early child stimulation and responsive care intervention package delivered to preterm or term small for gestational age babies during infancy on growth and neurodevelopment: study protocol of an individually randomized controlled trial in India (Small Babies Trial). *Trials*. 2024;25(1):1–14. <https://doi.org/10.1186/s13063-024-07942-z>
 7. Silano M, Milani GP, Fattore G, Agostoni C. Donor human milk and risk of surgical necrotizing enterocolitis: A meta-analysis. *Clinical Nutrition*. 2019;38(3):1061–6. <https://doi.org/10.1016/j.clnu.2018.03.004>
 8. Arbolea S, Saturio S, Suárez M, Fernández N, Mancabelli L, De Los Reyes-Gavilán CG, et al. Donated Human Milk as a Determinant Factor for the Gut Bifidobacterial Ecology in Premature Babies. *Microorganisms*. 2020;8(5):760. <https://doi.org/10.3390/microorganisms8050760>
 9. Bertino E, Giuliani F, Baricco M, Di Nicola P, Peila C, Vassia C, et al. Benefits of donor milk in the feeding of preterm infants. *Early Hum Dev*. 2013;89(SUPPL2):S3–6. <https://doi.org/10.1016/j.earlhumdev.2013.07.008>
 10. Menon G, Williams TC. Human milk for preterm infants: why, what, when and how? *Arch Dis Child Fetal Neonatal Ed*. 2013;98(6):F559–62. <https://doi.org/10.1136/archdischild-2012-303582>
 11. Altobelli E, Angeletti PM, Verrotti A, Petrocelli R. The Impact of Human Milk on Necrotizing Enterocolitis: A Systematic Review and Meta-Analysis. *Nutrients*. 2020;12(5):1322. <https://doi.org/10.3390/nu12051322>
 12. Kim EJ, Lee NM, Chung SH. A retrospective study on the effects of exclusive donor human milk feeding in a short period after birth on morbidity and growth of preterm infants during hospitalization. *Medicine (United States)*. 2017;96(35). <https://doi.org/10.1097/MD.00000000000007970>
 13. Lyons KE, Ryan CA, Dempsey EM, Ross RP, Stanton C. Breast Milk, a Source of Beneficial Microbes and Associated Benefits for Infant Health. *Nutrients*. 2020;12(4):1039. <https://doi.org/10.3390/nu12041039>
 14. Kimani-Murage EW, Wanjohi MN, Kamande EW, Macharia TN, Mwaniki E, Zerfu T, et al. Perceptions on donated human milk and human milk banking in Nairobi, Kenya. *Matern Child Nutr*. 2019;15(4):e12842. <https://doi.org/10.1111/mcn.12842>
 15. Cao W, Çelik M, Ergun Ö, Swann J, Viljoen N. Challenges in service network expansion: An application in donated breastmilk banking in South Africa. *Socioecon Plann Sci*. 2016;53:33–48. <https://doi.org/10.1016/j.seps.2015.10.006>
 16. Vizzari G, Morniroli D, Ceroni F, Verduci E, Consales A, Colombo L, et al. Human Milk, More Than Simple Nourishment. *Children*. 2021;8(10):863. <https://doi.org/10.3390/children8100863>
 17. Lindberg N, Berglund AL. Mothers' experiences of feeding babies born with cleft lip and palate. *Scand J Caring Sci*. 2014;28(1):66–73. <https://doi.org/10.1111/scs.12048>
 18. Peters MDJ, McArthur A, Munn Z. Safe management of expressed breast milk: A systematic review. *Women and Birth*. 2016;29(6):473–81. <https://doi.org/10.1016/j.wombi.2016.05.007>
 19. Boué G, Cummins E, Guillou S, Antignac JP, Le Bizec B, Membré JM. Public health risks and benefits associated with breast milk and infant formula consumption. *Crit Rev Food Sci Nutr*. 2018;58(1):126–45. <https://doi.org/10.1080/10408398.2016.1138101>
 20. Cheshmeh S, Nachvak SM, Hojati N, Elahi N, Heidarzadeh-Esfahani N, Saber A. The effects of breastfeeding and formula feeding on the metabolic factors and the expression level of obesity and diabetes-predisposing genes in healthy infants. *Physiol Rep*. 2022;10(19):e15469. <https://doi.org/10.14814/phy2.15469>