

АКТУАЛЬНІ ПИТАННЯ ОРГАНІЗАЦІЇ ПЕРИНАТАЛЬНОЇ ДОПОМОГИ В УКРАЇНІ

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ORGANIZING THE WORK OF THE DONOR
BREAST MILK BANK AT THE LVIV
PERINATAL CENTER IS AN EXPERIENCE
THAT MOTIVATES FURTHER DEVELOPMENT

Summary

Human milk is considered the primary source of nutrition for breastfed infants and is justifiably regarded as the «gold standard.» Errors in feeding breastfed infants negatively affect not only the child's physical health but also their functional capacities. No substitute for human milk can compete with the presence of biologically active substances inherent to the mother-child symbiosis.

However, in the medical care of premature infants and ill full-term neonates, situations arise when human milk is unavailable, even though it is critically needed by the child. In such cases, the best alternative to maternal breast milk is pasteurized donor human milk, which is made accessible through the Donor Human Milk Bank at the Lviv Regional Perinatal Center. In this public healthcare institution, a complete cycle of neonatal care for newborns is successfully implemented in accordance with modern, internationally recognized standards. One example of contemporary, evidence-based standards for feeding newborns – who, for various reasons, cannot be fed maternal human milk – is the operation of the Donor Human Milk Bank. Its equipment and functioning, with the support of the Polish Human Milk Banks Association, meet the highest global standards.

Information about the activities of the Human Milk Bank is disseminated to pregnant women through thematic lectures at the Academy of Parenthood. There, a personalized approach is successfully implemented for each pregnant woman, potential donor of breast milk, as well as for each woman who has delivered a live child. Active and substantive advisory work with potential donors serves as a guarantee for increasing the number of women willing to donate. The selection of donors and the operation of the Donor Human Milk Bank are conducted in accordance with the provisions of the clinical guideline «Collection, Storage, Transportation, Processing, and Banking of Donor Human Milk,» which was approved at the national level in Ukraine in 2022.

Since the inception of the Donor Human Milk Bank in December 2022, a total of 1254 liters of donor human milk have been collected from 127 donor women. The longest donation period lasted 11 months, during which one donor collected 50 liters of human milk. The highest amount of donor human milk collected from a single donor in one month was 55 liters.

Donor milk has most frequently been used for infants in the post-intensive care unit as well as for the care of premature infants and ill full-term newborns. Overall, about one-quarter of the infants born at the perinatal center have received donor human milk annually since December 2022.

Looking ahead, the Lviv Perinatal Center plans to meet the demand for donor human milk in all neonatology departments throughout the Lviv region that provide comprehensive medical care for both premature and full-term newborns. The establishment and expansion of a network of Donor Human Milk Banks may play a strategically important role in ensuring the provision of donor human milk to needy newborns during the current wartime situation in Ukraine and amid a severe demographic crisis.

Key words: Premature Infants; Newborn; Human Milk; Donor Human Milk; Donor Human Milk Bank.

Infancy represents the most critical phase in a child's life, as it is during this period that structural differentiation occurs and the primary regulatory mechanisms, including the central nervous system, are established following intrauterine life.

Errors in nutrition and care during infancy can have irreversible consequences, as they cannot be rectified in later stages of adulthood.

Breast milk is universally recognized as the optimal source of nutrition for infants. It is safe, pure, and contains antibodies that protect against numerous common childhood illnesses. Breast milk fulfills the energy and nutritional requirements of infants during the first months of life, providing over half of their nutritional needs in the latter half of the first year and up to one-third during the second year.

The absence of breastfeeding can lead to deficiencies in critical immunological components, such as anti-inflammatory substances, antibodies, and white blood cells [2].

Research indicates that breastfed children exhibit higher levels of cognitive development, lower rates of overweight and obesity, and a reduced risk of developing diabetes later in life [4].

However, preterm infants and sick full-term newborns are particularly vulnerable to disease and mortality, often missing out on the life-saving benefits of breast milk.

For these newborns, breast milk from their own mother is the first best option for feeding, but due to a number of reasons, temporary or absolute contraindications on the part of the mother to breastfeeding, it is impossible to meet the nutritional needs of the child with mother's

breast milk, then the next best option is donation of women's milk.

In other words, in cases where a child cannot be fed with its own mother's milk, the best alternative is to feed it with donor human milk. According to the recommendations of the World Health Organization (WHO), the American Academy of Pediatrics and the United Nations Children's Fund (UNICEF), *donor human milk is the best alternative food* for newborns and infants *after* mother's milk [3].

Pasteurized donor human milk may be prescribed in the following situations and cases:

- the mother is absent due to divorce, illness, death, or abandonment;
- Mothers infected with HIV, human T-cell lymphotropic virus type I or II, untreated brucellosis, Ebola virus disease, or breast cancer with double mastectomy
- Mothers who need medications that are contraindicated during breastfeeding, such as amiodarone, chemotherapy or antineoplastic agents, chloramphenicol, ergotamine, gold salts, phenindione, radioactive pharmaceuticals, retinoids, tetracyclines (use for more than 3 weeks) and certain psychotropic drugs
- Mothers who use phencyclidine, cocaine, and cannabis may be potential candidates for long-term neurobehavioral developmental disorders in their infants. At the same time, it is necessary to weigh the potential risk-benefit ratio in cases of maternal drug dependence and the development of neonatal abstinence syndrome in her child. It is in the case of neonatal abstinence syndrome that breastfeeding reduces the clinical manifestations of the latter [1].
- lesbian, gay, bisexual and transgender (LGBT) couples, foster and other non-lactating parents;
- mothers who do not have enough breast milk in the first days after childbirth, despite lactation support [4].

In accordance with the recommendations of the evidence-based clinical guideline «Collection, storage, transportation, processing and banking of donor human milk», which is a regulatory industry standard approved by the State Expert Center of the Ministry of Health of Ukraine, the target categories for the administration of donor human (breast) milk are:

- prematurely born children
- infants with very low and extremely low birth weight;
- other high-risk newborns, serious condition;
- children born at term to mothers who have a serious condition after childbirth, additional interventions that delay or prevent lactation;
- children deprived of parental care in the first 3 days of life;
- children preparing for surgery;
- absence of mother's milk, its shortage or the presence of contraindications to breastfeeding [6]
- Donor milk is a bridge to breastfeeding with positive clinical and psychological benefits for both mother and child [7]
- donor milk is of great importance for newborns born prematurely, with low birth weight for their gesta-

tional age, low birth weight, diseases or complications during childbirth, and for those who require hospitalization [8].

International studies consistently demonstrate that pasteurized donor milk provides superior nutritional and immunological benefits compared to formula, significantly reducing infectious complications in preterm and low-birth-weight infants. A systematic review revealed that the use of pasteurized donor milk reduced the incidence of necrotizing enterocolitis by 46% compared to formula feeding in preterm or low-birth-weight infants. Additionally, the consumption of donor milk was associated with a 19% reduction in sepsis risk for every 10 ml/kg of milk consumed daily by very low-birth-weight infants during the first 28 days of life [5, 7, 8].

Breast milk banks are an integral part of the modern system of postnatal care, especially if children require long-term treatment or breastfeeding by their biological mother is difficult. Thanks to milk banks, preterm infants can be fed exclusively breast milk from the first minutes of life.

It is important to integrate women's milk banks into existing medical facilities to expand global access to the use of donor milk for infant feeding [7].

What is a breast milk bank?

A **breast milk bank** is a high-tech institution whose activities include

- collecting breast milk from mothers who produce more than their children need.
- processing and storage of breast milk.
- feeding babies who, for medical or other reasons, cannot receive it temporarily or for a long time.

The modern breast milk bank was opened at the Lviv Perinatal Center on December 19, 2022, during the period when Ukraine was at war. The breast milk bank was opened with the support of the Lviv Regional Military Administration (Photo 1).

The information and technical component of the Bank's project and staff training were made possible with the assistance of the Association of Breastmilk Banks of Poland. The Bank operates in accordance with the Clinical Guideline «**Collection, Storage, Transportation, Processing and Banking of Donor Human Milk**» approved in Ukraine in 2022 [6].

The operation of the breast milk bank is one of the high-tech areas of the Lviv Perinatal Center's work. The bank is equipped with all the necessary equipment that meets the highest modern international standards. These include special refrigerators with a temperature indicator, freezers for storing milk, ultrasonic homogenizers for analyzing milk, pasteurizers, and other equipment. The Bank's work is highly computerized.

The Lviv Perinatal Center has implemented a full cycle of neonatal care in accordance with international standards within one institution through the following departments

- anesthesiology and intensive care of newborns;
- post-intensive care of newborns and nursing of premature infants from 500 grams
- postnatal care for newborns;
- medical rehabilitation of prematurely born and young children



**Photo 1. Director of the Lviv Regional Clinical Perinatal Center M. Malachynska
Head of the Breast Milk Bank at the Lviv Oblast Perinatal Center O. Shlemkevych
Breastfeeding consultants of the Lviv Oblast Clinical Perinatal Center L. Zhuk, I. Pylypiv, H. Pigan, A. Farat**

Pregnant women will receive information about the activities of the Breast Milk Bank at thematic lectures of the Parenting Academy (photos 2;3), which are regularly held by leading specialists of the Lviv Perinatal Center for

pregnant women and their partners during their preparation for childbirth. After the birth of the child, breastfeeding consultants work with each new mother. At the same time as providing counseling to mothers, they search for and recruit donors.



Photo 2. A. Farat conducts a breastfeeding consultation



Photo 3. O. Shlemkevych gives a lecture for expectant mothers on «How to ensure successful breastfeeding»

Who can become a milk donor?

Donor recruitment usually occurs during the postpartum period among women who have been and remain under gynecological/obstetric and lactation care. Donors are mostly mothers who have consciously chosen breastfeeding as a way of feeding their child, know its benefits for the child and, for altruistic reasons, want to provide optimal nutrition for other children. Today, the donors of the Breast Milk Bank are mostly mothers who gave birth at the Lviv Perinatal Center. Thanks to the spread of information about the Bank's activities, mothers who gave birth in other maternity hospitals began to express their desire to become donors.

An interesting fact is that donors are often women who have given birth to a child prematurely, a low birth weight, a sick child, and fed him or her with donor milk. With the support of breastfeeding consultants, they established

lactation and later expressed a desire to share their own milk.

Milk donation is possible during the first 12 months of breastfeeding.

Interesting facts about the work of our breast milk donors (photo 4) [9]:

- 1254 liters of donated breast milk have been collected by the Bank since its launch in December 2022 and 1194 liters have been distributed
- total number of donors is 127;
- longest period of donation by one woman – 11 months – 50 liters of milk;
- largest amount of milk collected from one donor – 79 liters in 5 months;
- the largest amount of milk from a donor in one month – 55 liters.



Photo 4. Breast milk donors

How does the Breast Milk Bank work?

In the Breast Milk Bank, donor milk is collected, tested, processed and prescribed by a doctor to children who need it. The entire process is carefully controlled at every stage (from the examination of female donors, research on the composition and microbiological purity of donor milk, pasteurization to ensure microbiological safety and preservation of maximum nutritional value, and compliance with storage conditions). The duration of donated breast milk use is also determined by doctors, taking into account the lactation capacity

of the biological mother, the severity of the infant's condition, etc.

The premises of the Breast Milk Bank consist of a laboratory room equipped with modern equipment for testing, pasteurization, freezing and storage of milk, and a room for interviews, donor consultations, and for expressing breast milk by mothers of children in the perinatal center's departments. The equipment of the laboratory room includes a pasteurizer, a transport trolley, a laminar flow box, a milk composition analyzer, a refrigerator with a freezer, a place for milk portioning and composition testing.



**Photos 5; 6. Breast milk bank laboratory
I. Pylypiv pasteurizes milk**



**Photo 7. Room for consultations
O. Shlemkevych consults a donor**

Before using donor milk, the Breast Milk Bank consultants take the following steps:

1. **Screening of donors.** Contact of a potential donor with a Breast Milk Bank consultant, who conducts a survey on the woman's health status, past or present diseases, medications, diet and lifestyle. A healthy woman who has excess breast milk and is willing to share it can become a donor.

2. **Serological examination of the donor** to exclude infections: hepatitis B and C, HIV and syphilis.

3. **Providing the donor with the necessary information** on the rules of milk expressing, proper storage, adequate

freezing of milk and its transfer to the Breast Milk Bank.

4. **Milk is collected** at the Lviv Perinatal Center or delivered from the donor to the Bank.

5. **Investigation of the composition and microbiological purity of donor milk, its pasteurization.**

Qualitative analysis of the milk composition is carried out on an analyzer, which determines fats, proteins, carbohydrates and calories.

Pasteurization involves heating milk to a temperature of 62.5 °C to eliminate microorganisms.



Photo 8. Milk before and after pasteurization

1. Storage

Milk is frozen and then stored at a temperature of –18 to –20 °C in laboratory-type freezers for no more than 3 months (Photo 9).

During the first meeting of the breastfeeding consultant with the donor, a questionnaire is filled out regarding her health and lifestyle, and the terms of cooperation are discussed. Each donor has her own number – an identifier. It is needed for the information that is placed on the bottle of milk after pasteurization.

The donor is provided with a set of tools necessary for expressing milk. The kit includes: a breast pump, bottles

for storing milk, individual disposable kits for expressing milk. When a certain amount of milk has been collected, a courier delivers the expressed milk from the donor to the Breast Milk Bank in a thermal bag at a certain temperature.

Subsequently, the milk is tested for bacteriological purity before and after pasteurization, and pasteurization is performed to ensure microbiological safety and preservation of maximum nutritional value. The quality composition of milk is also determined. After pasteurization, the milk is stored in the freezer until it is dispensed.



Photo 9. Refrigerators where donor milk is stored

2. Delivery of donor milk to neonatal

Milk is allowed to be used after its quality is confirmed in accordance with the clinical guideline «Collection, storage, transportation, processing and banking of donor human milk» approved in Ukraine in 2022.

The decision to prescribe milk from the Bank is made by a doctor in consultation with the Bank's consultants, with the consent of the mother and father of the child to feed the child with donor milk (Photo 10).

The future goals of the Lviv Perinatal Center's Breast Milk Bank are to:

1. Attracting more donors to the Breast Milk Bank.
2. Providing more children born at the Lviv Perinatal Center with donor breast milk, if needed.
3. With the increase in reserves, donor milk from the Breast Milk Bank can be used to meet the needs of newborns in other medical institutions in Lviv.



Photo 10. Children in the neonatal intensive care unit with neonatal surgery who are fed with donor breast milk

Every year, about 1000 of all newborns at the Lviv Perinatal Center are preterm infants with low and extremely low birth weight. They, as well as sick full-term babies, are the first to receive donor milk. Donor milk can also be given to children who, for certain reasons, are temporarily unable to feed on their own mother's milk. The largest amount of donor milk was received by children in the neonatal intensive care unit and preterm infants.

In the future, the Lviv Perinatal Center plans to supply donor breast milk to maternity hospitals in Lviv and neighboring regions.

Thus, thanks to the uninterrupted functioning of the Lviv Perinatal Center's breast milk bank, preterm and full-term infants who, for some reason, cannot receive breast milk from their own mothers, have the opportunity to optimally meet their nutritional and biologically active needs with the best food product – donor human (breast) milk.

The experience of the effective operation of the Lviv Perinatal Center's breast milk bank can serve as an excellent example for the establishment of new donor breast milk banks in different regions of Ukraine.

Promoting the creation of a network of breast milk banks in Ukraine at the state level will help to make a significant contribution to the preservation of the full

healthy development of newborns and infants in our country, which has become especially important in times of war and a deep demographic crisis in Ukraine.

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ОРГАНІЗАЦІЯ РОБОТИ БАНКУ ДОНОРСЬКОГО ГРУДНОГО МОЛОКА ЛЬВІВСЬКОГО ПЕРИНАТАЛЬНОГО ЦЕНТРУ – ДОСВІД, ЩО МОТИВУЄ ДО ПОДАЛЬШОГО РОЗВИТКУ

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Резюме.

Основним видом їжі для немовлят грудного віку, її «золотим стандартом», аргументовано вважається людське молоко. Допущені помилки у вигодовуванні дітей грудного віку залишають негативний вплив не тільки на фізичне здоров'я організму дитини, але й на його функціональні можливості. Жодний замінник людського молока не може позмагатися із вмістом біологічно активних речовин, спорідних із симбіозом «мати-дитина».

Однак в медичному процесі виходжування передчасно народжених немовлят, хворих доношених новонароджених виникають ситуації, коли людське молоко є недоступне, при тому, що воно вкрай необхідне дитині. В таких випадках найкращою альтернативою материнського грудного молока є пастеризоване донорське грудне молоко, завдяки існуванню Банку донорського грудного молока є доступним у Львівському обласному перинатальному центрі. У цьому державному закладі охорони здоров'я успішно реалізується повний цикл надання неонатальної допомоги новонародженим відповідно до сучасних, найкращих світових стандартів. Одними із зображень сучасних науково-обґрунтованих стандартів вигодовування новонароджених дітей, які з різних причин не можуть вигодовуватись материнським людським молоком є функціонування Банку донорського людського молока, оснащення і робота якого, за сприяння Асоціації Банків грудного молока Польщі відповідає найвищим світовим стандартам.

Поширення інформації про діяльність Банку грудного молока вагітні жінки отримують на тематичних лекціях Академії батьківства. Там успішно реалізується персоналізований підхід до кожної вагітної, потенційної донорки грудного молока, а також до кожної жінки, що народила живу дитину. Активна, змістовна консультативна робота з потенційними донорками людського молока слугує запорукою збільшення кількості бажаючих жінок бути донорами. Відбір донорок і забезпечення роботи Банку грудного донорського молока проводиться відповідно до положень клінічної настанови «Збирання, зберігання, транспортування, обробка та банкінг донорського жіночого молока», затвердженої на державному рівні в Україні у 2022 році.

Від початку роботи Банку донорського грудного молока з грудня 2022 року було зібрано 1254 л донорського грудного молока від 127 жінок-донорок. Найдовший період донорства склав 11 міс. За цей період донорка збрала 50 л людського молока. А найбільша кількість донорського людського молока від однієї донорки за 1 міс склала 55 л.

Найчастіше донорське молоко використовувалося для дітей відділення постінтенсивного догляду новонароджених і виходжування передчасно народжених і хворих доношених новонароджених дітей. Загалом, близько ¼ частина дітей, народжених в перинатальному центрі щороку, починаючи з грудня 2022 року отримували донорське людське молоко.

У планах на перспективу Львівський перинатальний центр має забезпечення потреб у донорському людському грудному молоці усі відділення неонатологічного профілю Львівської області, що надають повний обсяг медичної допомоги передчасно народженим і доношеним новонародженим. Стратегічно важливу роль у забезпеченні донорським людським молоком здоров'я потребуючих новонароджених в часи воєнного сьогодення в Україні та глибокої демографічної кризи може відіграти створення і відкриття мережі Банків донорського людського молока.

Ключові слова: передчасно народжені немовлята; новонароджений; людське молоко; донорське людське молоко; банк донорського людського молока.

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