

JOURNAL FOR NICU & MATERNITY CARE

# Beginnings



## MILK BANKS IN EUROPE

**Creating synergies  
for better care**

## HANDLE WITH CARE

**How to standardise  
breast milk management**

## INCREASING THE DOSE

**Quality improvement  
for more milk in the NICU**

MILK BANKS

# Donor milk is not a luxury!

IT IS PART OF GUIDELINE-COMPLIANT NUTRITIONAL THERAPY FOR PREMATURE BABIES

An interview with EMBA board member and neonatologist Prof. Daniel Klotz about why every perinatal centre should consider establishing a milk bank and how donor milk can support breastfeeding rates.



**Prof. Daniel Klotz**  
EMBA board member, founding member milk bank network Baden-Württemberg/Germany; Department of Neonatology and Paediatric Intensive Care Medicine, Protestant Hospital Bethel Foundation, University Hospital OWL, Bielefeld University, Bielefeld, Germany

**Dr Klotz, why should every large hospital with a perinatal centre in Europe consider setting up a donor milk bank?**

If, despite optimal support through breastfeeding and lactation management, there is not enough own mother's milk available, then donor milk from milk banks is the ideal replacement food. This is uniformly recommended by the World Health Organisation and many medical associations worldwide.

**A mother's own milk is perfectly suited to the needs of a newborn. What can donor milk contribute to help the infant thrive?**

Premature infants who are fed with donor milk instead of formula have a significantly lower risk of developing a very serious gastrointestinal inflammation known as NEC, which often leads to lifelong intestinal problems or even death. Studies have repeatedly confirmed that a diet of donor milk protects against this disease. At the same time, there is evidence that donor milk nutrition can protect premature babies from infections and a specific eye disease. Donor milk is also better tolerated than breast milk substitutes, so digestion also benefits.

**What do you answer critics who claim that milk banks are an expensive luxury?**

Imagine there was a drug that could halve the

incidence of a certain serious event leading to death or severe disability. Would the use of this drug be considered a luxury? No. Donor milk is not a luxury! Rather it is part of guideline-compliant nutritional therapy for premature babies. When it comes to costs, there are very different systems for donor milk within Europe. In some countries the cost is reimbursed. In other cases the hospital has to pay for it. Good treatment costs money.

**Does EMBA offer precise guidelines for the organisation and operation of a milk bank? Where do national regulations come in?**

EMBA has formulated basic requirements for the establishment and operation of milk banks, some of which have been incorporated into various national guidelines. However, the structure and function of a milk bank always depend on local circumstances and needs vary greatly, both nationally and internationally. At the same time, there is no real scientific evidence for many procedural aspects. Therefore, in addition to national guidelines and country-specific mandatory legal provisions, good clinical practice plays a key role in the operation of a milk bank.

**In your personal experience, what are the challenges of setting up a donor milk bank?**

Setting up a milk bank is a lengthy process. The obstacles to implementation often lie in the details. There are many stakeholders and everyone has to be involved. Our experience was that many employees were able to identify with the 'Donor Milk Bank Project' and that it found supporters at all levels, be it in the areas of nursing, technology or administration. This was ultimately the key to our success.

**How are donated breast milk samples analysed and processed to ensure their safety and nutritional quality?**

Every step of the process, from the recruitment of the donor to the distribution of the donor milk to premature infants, is set out in writing in procedural instructions and all employees are trained accordingly. Once the donor has been approved, we carry out microbiological tests on every batch of donor milk before we pasteurise it. Each batch is given a code so that it can be traced at any time and a reserve sample is taken and stored for six months. The milk is stored frozen at -25°C for a maximum of six months before it is released. Thanks to our network, we have a very high turnover of almost 1000 litres per year. Continuous quality management and regular training complement the well-rehearsed processes.

**You mention the network of donor milk banks that you have set up in your region. How does this co-operation work in practice?**

The aim of our network is to provide all small premature babies in our federal state with donor milk if required. Participating hospitals offer mothers from their region the opportunity to donate their milk. The donated milk is then stored frozen in the participating clinics. As one of currently two central hubs in our federal state, we release the mothers for donation after a blood test, collect the milk from the participating hospitals, analyse and process the milk and then

store it. When it is required, the hospitals can retrieve the milk. By bundling the time-consuming steps in two hubs and taking over the entire logistics and tracking of the milk, we lower the threshold for smaller hospitals to use donor milk. To finance this system, we pass on some of the costs to our network members.

**How can we ensure that donor milk is not just 'another product from the fridge'? Can milk banks support breastfeeding rates?**

Basically, donor milk should always be seen as a substitute nutrition. Its use is therefore not a quality criterion per se, but an instrument to achieve our actual goal: healthy children who are breastfed on discharge. This is why breastfeeding and lactation management always comes first. The aim of a milk bank is to be used as rarely as possible. Studies show that mothers start lactating better and breastfeed more often when donor milk is available as a substitute. It is unclear whether this is because staff in hospitals with access to milk banks are more concerned with the topic of breastfeeding and lactation, or whether mothers of premature infants perceive the "bridging effect" of donor milk as relieving and therefore start lactating better. It is probably due to a combination of several factors.

## CONTENT

02	<b>Milk bank potential</b> How to set up successful donor milk management
04	<b>Increasing the dose</b> New standards for more mother's milk
12	<b>Best case</b> How to support long-term breastfeeding success
14	<b>Biological nurturing</b> A way to minimise early breastfeeding issues?
16	<b>Handle with care</b> Warming and thawing breast milk with Calesca
18	<b>Safe Storage</b> Guidelines for at home
19	<b>Local News</b>

## IMPRESSUM

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INCREASING

# The dose



HOW TO IMPROVE THE AVAILABILITY OF OWN MOTHER'S MILK  
IN THE HOSPITAL AND BEYOND

High dose and long exposure to own mother's milk significantly impacts the subsequent health outcomes of infants.<sup>1,2</sup> This is especially true for children born prematurely and/or with health issues – yet often timely availability of that healthy dose of liquid gold is not a given. The good news: Research shows that standardised interventions and implementation of evidence-based care make all the difference here and lead to optimal results.

**6 indicators to take into account to get the mother's lactation – and the provision of own mother's milk to the infant – right from the start.**

## I INFORMED DECISION

Supporting the feeding of their vulnerable infant with own mother's milk (OMM) is a decision, parents must consciously make. However, an informed decision can only be made when mothers and families have access to standardised, reliable information to guide their choices. Parents should therefore be provided with consistent, evidence-based information around lactation and infant feeding from as early as possible. When mothers are informed and understand that their milk is an essential medical intervention, that no one else can provide to their infant, they almost always decide to express milk. In addition, mothers consistently report stronger commitment if they understand the evidence-based value of their milk.<sup>3-8</sup>

NICU families in particular often experience a state of shock, despair and helplessness. Discussions with medical staff regarding the critical value of OMM can change their outlook to one of hope and a new sense of purpose. In a study at Rush University Medical Center in the US, after being guided through the information, 98% of mothers chose to pump – although 50% had intended to feed formula before.<sup>3</sup> Most recently, Prof. Sven Wellmann at KUNO Klinik St. Hedwig, Krankenhaus Barmherzige Brüder in Regensburg /Germany, found equally impressive results in a similar study (see page 12/13).

### GET IT RIGHT

- ✓ **Provide parents with early information** on the importance and benefits of OMM.
- ✓ **Educate all professionals and make sure communication is consistent** across all departments to avoid confusion.



## II TIME TO FIRST EXPRESSION

Early breast stimulation is proven to have a positive impact on future milk supply and subsequent feeding outcomes. According to WHO guidelines, skin-to-skin and breastfeeding should happen within the first hour of birth.<sup>9</sup> If breastfeeding is not (yet) possible or effective, the breast should be stimulated by double pumping with an electric pump, ideally within the first three hours of birth, no later than six hours. This timely activation of a mother's milk supply is critical, as it is a one-time event that is either achieved to its full potential – or not. Without appropriate – proactive! – lactation support, mothers of vulnerable infants who

cannot yet stimulate the breast effectively, are at high risk for delayed secretory activation (milk 'coming in') and sub-optimal milk production. On the other hand, mothers who cannot breastfeed but use a double electric pump for stimulation and pump early are more likely to continue pumping at six weeks – and they are more likely to still be breastfeeding/expressing at discharge.<sup>4,10-14</sup>

In short:  
The early initiation of pumping means more OMM for infants in the long-term.

## THE IMPACT OF SYMPHONY'S INITIATE PROGRAM



### GET IT RIGHT

- ✓ **Facilitate early double expression (ideally still in the delivery suite!)** with a double electric hospital pump with initiation technology.
- ✓ **Help the mother find the right breast shield size** and assemble her pump sets.
- ✓ **Assist her** with her first expressions.  
For support you can access step-by-step instructions in several languages via the Medela Symphony Hub at [medela.com/symphony-hub](http://medela.com/symphony-hub)
- ✓ **Make sure to set appropriate expectations** and check in with her regularly.

## III FREQUENT EXPRESSION

Frequent expression is of great importance during the first 14 days after birth to initiate and build adequate milk volumes for future milk supply. The hormonal changes after birth play a crucial role: In the first days after birth, the fall in progesterone and the rise in prolactin as well as breast stimulation are the physiological triggers for the onset of significant milk production (milk 'coming in') between 24 and 72 hours. When the infant is not able to breastfeed, mothers should be supported to express at least eight or more times in 24 hours, including once during

the night to make use of the additional increase in prolactin secretion during that time.<sup>10</sup> When milk is removed frequently, the breasts are drained effectively to build an adequate milk supply by day 14. In turn, if milk removal is infrequent in this early post-birth period, a delay in the onset of milk coming in can occur and milk volumes are highly likely to remain permanently lower than required.<sup>15,16</sup>

### GET IT RIGHT

- ✓ **Make sure the mother has access** to a pump and accessories whenever she needs them.
- ✓ **Provide mothers with a pumping log** to track daily sessions and milk volumes.
- ✓ **Provide clear guidance.** Specify at least one pump session between 00:00 and 07:00 a.m. (no break longer than five hours!)



PUMP DEPENDENT MOTHERS WHO HAVE MILK VOLUMES THAT ARE LOWER THAN 150ML/DAY ON DAY 4 POST BIRTH ARE AT >9x GREATER ODDS OF LOW MILK SUPPLY<sup>15</sup> AND >7x GREATER ODDS OF FORMULA FEEDING AT NICU DISCHARGE AND BEYOND.<sup>17</sup>

# IV TIME TO MILK COMING IN

As stated before, any delay in milk coming in is linked to risks of low milk volumes and a shortened duration of lactation.<sup>18,19</sup> Milk coming in normally occurs between 24 - 72 hours after birth.<sup>20</sup> Subjectively, mothers report this event with a feeling of breast fullness, tender breasts and emotional tearfulness. Objectively, in pump-dependent mothers, this is the time they first achieve a total expressed volume of  $\geq 20$  ml

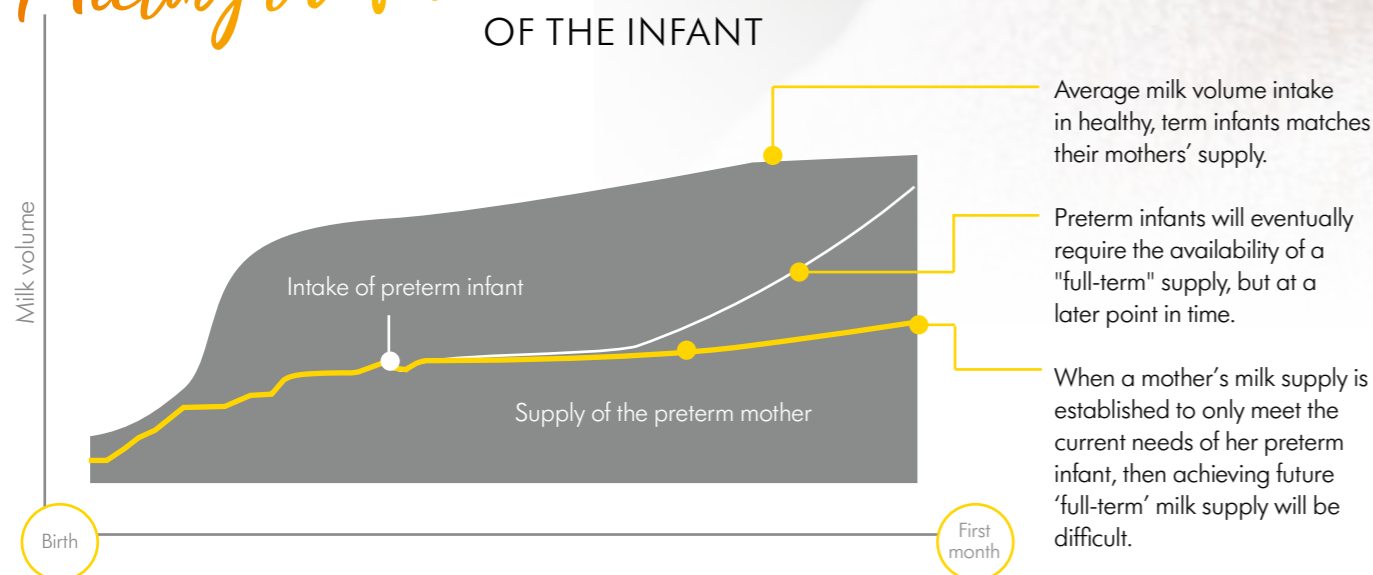
in one pumping session. Milk coming in beyond 72 hours is defined as delayed onset of lactation.<sup>20</sup> In fact, mothers with delayed onset of milk coming in have 60% higher odds of stopping breastfeeding at four weeks.<sup>18</sup> Furthermore, low milk volumes on day 4 are associated with an eight times higher chance of low milk supply at six weeks.<sup>15</sup>



## GET IT RIGHT

- ✓ **Identify mothers with risk factors** for delayed secretory activation, so your education and lactation support can be proactive and targeted.
- ✓ **Make sure of early activation of pumping**, as well as frequent pumping, if breastfeeding is not effective.
- ✓ **Track pump volumes!**

## Meeting the future needs OF THE INFANT



### RISK FACTORS FOR DELAYED LACTATION:

#### Antenatal

- Maternal obesity<sup>21,22,24</sup>
- Diabetes<sup>23,26</sup>
- Breast surgery<sup>25</sup>
- Primiparity<sup>23,26,28</sup>
- Induction of labour<sup>27,28</sup>
- Planned C-Section<sup>29</sup>



#### Postnatal:

- Unplanned C-section<sup>29</sup>
- Stressful or prolonged labour/birth; psychological stress/pain<sup>30-33</sup>
- Postpartum haemorrhage<sup>23,34</sup>
- Preterm or late preterm infant<sup>23,35</sup>
- Mother – infant separation<sup>36</sup>
- Delayed first breastfeeding episode<sup>37</sup>
- Supplementation within the first 48 hours<sup>23,28</sup>
- Low frequency of breastfeeding and/or expressing<sup>38,39</sup>
- Retained placenta products<sup>40</sup>



## COMING TO VOLUME

Coming to volume is defined as a total daily milk volume of  $> 500$  ml by day 14 post birth.<sup>41,42</sup> It indicates that milk supply is on track to meet the infant's long-term needs: Coming to volume by day 14 is the strongest predictor of feeding OMM at NICU discharge. Building milk supply in the first 14 days takes advantage of the high

levels of milk-production hormones<sup>43</sup>. That is also why one month post birth, it is more difficult to increase milk supply significantly.<sup>41,44</sup> Once the mother has come to volume, she should be assisted to achieve 700 ml or more daily to meet the daily intake needs of a healthy term-born infant.



## GET IT RIGHT

- ✓ **Always encourage double pumping.** It helps obtain up to 18% more milk with a higher fat content, in half the time.
- ✓ **Track daily milk volumes** so you may intervene immediately if problems arise.
- ✓ **Check regularly if the breast shields fit.** Comfort is important for a good milk flow.
- ✓ **Always adjust the pump to the highest comfortable vacuum level** to help remove more milk in less time.



## VI DOSE OF OWN MOTHER'S MILK



The dose of own mother's milk means the proportion (%) or amount (mL/kg/day) of oral feeds that is comprised entirely of OMM. OMM is a medical intervention in the NICU and works in a dose-response manner for prematurely born infants. Higher doses of own mother's milk (and the avoidance of bovine formula) are low-cost interventions that reduce the risk of many morbidities such as NEC and sepsis and are also shown to shorten the length of the

hospital stay.<sup>4, 45-53</sup> What is important, is to always track the volume of each dose of own mother's milk fed to the infant. Ideally, feeding logs should specify the relative composition and volume of each feed: How much was OMM, how much donor human milk (DHM) and how much formula. Donor milk should always be the preferred substitute for OMM, if available. (To this end, also read our interview on page 2 about milk banks!)

### GET IT RIGHT

- ✓ **Revise feeding policies and procedures** and ensure staff are informed.
- ✓ **Ensure early and frequent milk expression.** Don't forget to track!
- ✓ **Facilitate the use of DHM as a bridge** to avoid bovine formula if the availability of OMM is delayed.
- ✓ **Stipulate that feeding logs define the relative composition and volume of each feed:**  
OMM:DHM:Formula. Aim for all NICU infants to receive: 100% human milk (OMM/DHM) for the first 14 days and >50 ml/kg/day OMM (average daily dose) in the first 28 days.



THE NECESSARY STANDARDS ARE WELL DOCUMENTED: THE TRAINING OF HEALTHCARE STAFF, INFORMATION FOR PARENTS, THE AVAILABILITY OF BREAST PUMPS, EARLY DOUBLE PUMPING, THE ADMINISTRATION OF COLOSTRUM. BUT: IT ONLY COUNTS FOR THE PATIENT IF WE CONSISTENTLY IMPLEMENT THESE MEASURES!

Prof. Sven Wellmann, Head of Neonatology at KUNO Klinik St Hedwig, Krankenhaus Barmherzige Brüder, Regensburg, Germany

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### EVALUATE – EDUCATE – MEASURE

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# MOTIVATING, SUPPORTIVE COMMUNICATION FROM PROFESSIONALS IS ESSENTIAL!

What are the prerequisites for long-term breastfeeding success in late preterm infants?  
Prof. Sven Wellmann found clear answers in a prospective intervention study in Germany.

## Best case



**Prof. Sven Wellmann,**  
Head of Neonatology  
at KUNO Klinik  
St Hedwig, Krankenhaus  
Barmherzige Brüder,  
Regensburg, Germany

80 – 90% of all premature babies are born between 32 and 36 weeks of pregnancy as so-called moderate and late premature babies. At KUNO Klinik St. Hedwig, this affects around 300 children per year. Because they usually require little intensive care, this largest group of premature infants is often at risk of being overlooked in everyday clinical practice – yet they also urgently need support. These children miss four to eight crucial weeks of development in the womb – with not only short-term but also long-term consequences: The body weight and brain volume of premature babies born at 34 weeks' gestation are around 40% lower than those born at term and their organ maturation is incomplete! Around every second newborn in this group is also affected by a respiratory adaptation disorder, especially children after a caesarean section due to the inadequate removal of fluid from the baby's lungs.<sup>2,3</sup> These moderate and late preterm infants have an average neurological outcome that is about 6% worse after 18 months<sup>4</sup> and an increased

cardiometabolic and respiratory risk at the age of 3 –12 years.<sup>5,6</sup> We therefore asked ourselves the question: How can we best support these late preterm infants? What are the predictors of long-term breastfeeding success?

### Training makes the difference

Our intervention: a large-scale training campaign for mothers as well as our staff throughout the gynaecological and paediatric wards. All parents received a standardised information pack before and after birth. We put up posters – in the waiting area for birth registration, in the delivery room, on the wards – we distributed flyers and showed training videos, all with a uniform corporate identity. We used Neo-Milk\* as the sole source of information for parents and staff. We provided comprehensive training for midwives, nurses, doctors and all those who support mothers before and after birth. In order to ensure the availability of breast milk for all children and especially for premature infants, we also set up our own milk bank. The results

we measured were astonishing: 75% of the infants in this intervention group were fed with breast milk at the time of the German general check-up ("U4") at the age of 3–4 months. Before we started the intervention, this figure was only 48.5%. In addition, more than twice as many mothers in the intervention group had taken advantage of breastfeeding counselling.<sup>2</sup>

### The experience of self-efficacy

This shows how essential it is that we reach mothers early and comprehensively with information on the importance of breast milk and breastfeeding and provide them with ongoing counselling as informed professionals. A decisive success factor in our study was, among other things, that the mother produces at least 500 ml/day of breast milk on day 14 after the birth. In addition, the mother's early experience of self-confidence and self-efficacy in relation to breastfeeding (measured 14 days after birth) was an independent predictor of breast milk feeding at 3–4 months of age. To achieve this,

### THE INTERVENTION

- Comprehensive, early training campaign for (expectant) parents
- Comprehensive training of all staff (midwives, nurses, doctors)
- Implementation of a sole source of information ( Neo-Milk\*) with cross-ward visibility
- Establishment of a milk bank to ensure the availability of human milk for all children

### THE RESULT

**26,5%** more infants were fed breast milk after the intervention compared to before!

all recommendations must be implemented consistently: early information for the mother, early and regular expressing with a double pump, regular breastfeeding trials and consistent guidance by professionals with a standardised information platform.

### Caesarean section remains a slowing factor

Caesarean section delivery remains a challenge: Our study was able to show that caesarean section delivery has a negative impact on breast milk feeding at the time of the "U4" check-up. Special attention needs to be paid to the breastfeeding routine of new mothers. We need all staff to understand how important breast milk is for moderate and late preterm infants. This is the only way we can create the conditions for long-term breastfeeding success.

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# BEST Laid-back

## HOW BIOLOGICAL NURTURING MAY HELP PREVENT SORE NIPPLES AND EARLY BREASTFEEDING ISSUES

Pain is among the most common reasons why mothers stop breastfeeding early.<sup>1,2</sup>

While several breastfeeding positions can help, studies suggest that nature might have found the best way to start breastfeeding gently.

Newborns have innate reflexes and mothers react intuitively to their child's signals.<sup>3</sup> This can be seen particularly impressively immediately after birth: The so called biological nurturing or "laid-back breastfeeding" can be facilitated by uninterrupted skin-to-skin contact during the first hours after birth, when infants instinctively find their own way to the breast. It is the most natural way to start breastfeeding – and can be hugely beneficial as a preventative approach to reduce early breastfeeding problems like cracked or sore nipples at the same time.

### Encouraging natural reflexes

The "How to" is simple: By leaning back comfortably and well supported, the mother offers the baby the opportunity to lie on her chest. Infant reflexes help the newborn to lift its head and actively crouch and move towards the breast to grasp the nipple independently. Gravity ensures a close fit between the maternal breast and the infant's face. The infant takes the lead and the mother encourages and only supports it where necessary.<sup>3</sup> When renowned lactation specialist Suzanne Colson first started talking about this approach as "biological nurturing" in the 1990s and found it could not only give infants more control over how they feed but it may also help

relieve nipple pain and soreness, the general practice at the time was very different: Mothers would mostly be instructed to breastfeed in the cradle position, positioning both infant and breast as needed.

### Reduced risk of sore and cracked nipples

Colson's studies offered a revolutionized approach – that has been backed up by research since, most recently in an Italian study from 2020 and a Chinese meta-analysis from 2021: Both came to the conclusion, that the laid-back breastfeeding position significantly reduces the risk of sore and cracked nipples compared to traditional breastfeeding positions. The Italian study from 2020 involving 188 mother-infant pairs demonstrated that professional guidance on laid-back breastfeeding reduced the risk of sore nipples by around 40%. The effect was even more pronounced for sore, cracked nipples, where the risk was even reduced by 60%.<sup>4</sup> A Chinese meta-analysis came to similar conclusions in 2021. Including studies from the Asian region, the results showed that intuitive breastfeeding reduced the risk of painful nipples by around 75% and sore, cracked nipples by around 50%.<sup>5</sup> It may therefore be concluded that biological nurturing is an effective and simple breastfeeding position that makes it much easier to start breastfeeding – in the hospital and at home. Biological nurturing may also be helpful in cases of late preterm infants, hypotonic infants or those with oral peculiarities.

AS THE INFANT IS ABLE TO GRAB MORE BREAST TISSUE IN THIS POSITION, LATCH ON PROBLEMS ARE MINIMISED.

## BIOLOGICAL NURTURING ACCORDING TO SUZANNE COLSEN, 2012<sup>6</sup>:

1. The mother adopts a semi-upright/ semi-reclined position with the infant lying on her upper body.
2. The infant intuitively adopts a 'frog-like' position: arms and legs are bent; forearms, chest, stomach, thighs and lower legs are all in close contact with the mother's body.
3. The mother can give the infant some support by gently propping her hand under the infant's feet or bottom. The head remains free so that the infant can move towards the breast.
4. The infant grasps the nipple independently. Gravity supports positioning of the infant's mouth and jaw.

For more information about different breastfeeding positions, scan here.



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# Handle *with Care!*

## BREAST MILK MANAGEMENT THE EASY WAY

Thawing and warming breast milk for feeding it to the most vulnerable infants is a delicate discipline. Standardised practice and devices can help support feeding tolerances in infants and make life easier with safe routines for the staff.

### Preserving all benefits

Breast milk is medicine. Feeding premature and very low birth weight (VLBW) infants their own mother's milk, or, if this is not available, donor human milk, can significantly lower their risk for morbidities such as NEC<sup>1</sup> – if the unique properties of these life-giving drops are carefully preserved. Thawing and warming the milk in hot water, on a warming plate or even in the microwave is always subjective guesswork. Temperature control cannot be guaranteed, carrying the risk of damaging the fragile components of the milk, overheating and creating dangerous hotspots. Studies found that gentle forced dry heat is key to keeping all the important, living, bioactive and essential components such as proteins, lactoferrin, enzymes, immunoglobulins and vitamins, of stored human milk intact so that it remains as similar to fresh human milk as possible.<sup>2-7</sup>

### Preventing contamination

Some methods can also be a source of contamination with environmental pathogens. Hospital tap water for instance is a potential source of nosocomial infections from bacteria and other contaminants.<sup>8-12</sup> In some countries national (USA) or regional (UK) guidelines therefore even prohibit the use of water in the NICU. If breast milk is thawed at room temperature or in an incubator it might be exposed for too long or even mixed up.

### Getting the temperature right

Feeding delicate preterm infants can have its challenges. However, there is evidence that warming the milk to body temperature may promote greater feeding tolerance in very low-birth-weight preterm infants<sup>13,14</sup> and temperature can highly influence this: Feeding at body temperature had the least amount of gastric residuals and the greatest incidence of feeding tolerance, whereas preterm infants fed milk at cooler temperatures had the highest milk residuals and the greatest incidence of feeding intolerance.<sup>13</sup>

That is why a standardised, safe and easy-to-use device such as Medela's Calesca should be considered an essential item for all NICU or maternity wards to determine when breast milk is at the desired temperature.



# Calesca

## CONVENIENT WARMING AND THAWING OF HUMAN MILK



**STANDARDISED, QUICK AND ACCURATE.**  
For easy thawing and warming of breast milk.



**WATERLESS.**  
A completely dry system protects against water as a source of contamination.



**STABLE.**  
The temperature of warmed milk is maintained for up to 30 minutes.



**RELIABLE.**  
The alarm will sound when ready. It can also be muted as an option.



**FLEXIBLE.**  
Fits a variety of bottles and syringes. Either plastic or glass are safe.

More information on Calesca:



### TIP

#### USE CALESCA BY MEDELA AS A BUILDING BLOCK IN YOUR FAMILY-CENTERED CARE APPROACH

In the NICU, place Calesca directly next to the incubator to encourage families to be active participants in their baby's feeding, to build confidence and to encourage the feeding of breast milk as baby's primary source of nutrition.

**References:** 1 Johnson TJ et al. Neonatology. 2015; 107(4):271–276. 2 Donovan SM et al. J Pediatr Gastroenterol Nutr. 1991; 13:242–253. 3 Van Zoeren-Grobbe et al. Arch Dis Child. 1987; 62:161–165. 4 Wardell JM et al. Pediatr Res. 1984; 18(4):382–386. 5 Williamson S et al. Arch Dis Child. 1978; 53(7):555–563. 6 Czank C et al. Pediatr Res. 2009; 66(4):374–379. 7 Wills ME et al. Early Hum Dev. 1982; 7:71–80. 8 Molina-Cabrillana J et al. Am J Infect Control. 2013; 41(2):e7–e9. 9 Squier C et al. Curr Infect Dis Rep. 2000; 2(6):490–496. 10 Rutala WA et al. Infect Control Hosp Ep. 1997; 18(9):609–616. 11 Büyükyavuz BI et al. Jpn J Infect Dis. 2006; 59(4):213–215. 12 Anaissie EJ et al. Arch Intern Med. 2002; 162(1):1483–1492. 13 Dumm M et al. Adv Neonatal Care. 2013; 13(4):279–287. 14 Gonzales I et al. Neonatal Netw. 1995; 14(3):39–43.

# SAFE STORAGE @Home

WHILE THE SAFETY OF STORED BREAST MILK AT THE HOSPITAL IS GUIDED BY PROTOCOLS, MOTHERS NEED CLEAR INSTRUCTIONS WHEN PUMPING AT HOME. A GUIDELINE

Fresh milk contains live maternal cells and the highest amounts of nutrients, growth factors and many other protective components. Over time and with exposure to varying temperatures, these components decrease in potency, while the risk of bacterial contamination and growth of pathogens increases. This means separate recommendations are required for different temperatures and storage situations:

- **Room temperature** is safe for a short period of time. In general, warmer temperatures are associated with higher bacterial counts in expressed milk.
- **Refrigeration** at approximately 4°C has been shown to inhibit gram-positive bacterial growth for up to three days.

- **Freezing breast milk** at -20°C for up to three months has been recommended as optimal. At three months vitamins A, E and B, total protein, fat, enzymes, lactose, zinc, immunoglobulins, lysozyme and lactoferrin are maintained, although there may be vitamin C loss after one month. Bacterial growth is not a significant issue for up to six weeks. The antibacterial capacity, however, is generally less than that of fresh milk, due to the loss of live cells. Up to nine months in deep freeze at -20°C is considered acceptable, although changes in taste and smell may occur as lipase continues to break down fat into fatty acids.

Storage place	Room temperature 16 °C to 25 °C	Refrigerator 4 °C or colder	Freezer -18 °C or colder	Previously frozen breast milk thawed in the refrigerator
Safe storage time	Up to four hours is best	Up to three days is best	Up to six months is best	Up to two hours at room temperature
	Up to six hours for milk expressed under very clean conditions*	Up to five days for milk expressed under very clean conditions*	Up to nine months for milk expressed under very clean conditions*	Up to 24 hours in the refrigerator <b>Do not refreeze!</b>

## EASY POUR BREAST MILK STORAGE BAGS



**TRIED, TESTED AND RECOMMENDED** by over 84% of young families.\*\*

**ONE-HAND EASY POUR**  
Wide opening and secondary spout, preventing spills and cross-contamination.

**10X BETTER NUTRIENT PROTECTION**  
Ultra-thick double layers with a superior oxygen barrier.

**100% LEAKPROOF**  
Double-layer design and double zipper provide extra sealing.

**FLAT FREEZING, SELF-STANDING & EASY TO LABEL**  
For convenient space-saving storage in fridge and freezer. Easy to label.

**RECYCLABLE & BPA FREE**  
Ensuring the safety of both, the precious breast milk and the environment.

Discover our new breast milk storage bags online



\* Very hygienic conditions are ensured if the guidelines for cleaning and sterilisation in the Medela breast pump instructions for use are strictly followed. These guidelines for storing and thawing breast milk are recommendations. National and hospital internal guidelines and standards may deviate. \*\* Survey of 188 participants in the US following a two-week home trial, November 2023.  
References: Human Milk Banking Association of North America 2011 Best practice for expressing, storing and handling human milk in hospitals, homes, and child care settings (HMBANA, Fort Worth, 2011). Academy of Breastfeeding Medicine Protocol Committee; Eglash A. ABM clinical protocol #8: human milk storage information for home use for full-term infants (original protocol March 2004; revision #1 March 2010). Breastfeed Med. 2010 Jun;5(3):127-30.

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for more milk  
in less time!

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References: 1 Prime DK et al. Breastfeed Med. 2012 Dec;7(6):442-447. 2 Sakalidis VS et al. Acta Obstet Gynecol Scand. 2020; 99(11):1561-1567 (compared to 90° breast shields).



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