

INAC 2017

Milk banking worldwide

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Background



- Breast milk supports the development of the newborn's immature immune and digestive system, and provides components that support anti-infective defenses : ↓ child mortality.
 - Not all neonates are able to breastfeed: very pre-term infants
- ➔ Most vulnerable infants are at greatest risk of not receiving breast milk!

Therefore, it is recommended



World Health
Organization

(1) Own mother's milk

(2) Donor human milk from a HMB

(3) Preterm formula

~~(Term formula and extensively hydrolyzed formula)~~

Specific health benefits
for preterm infants

Donor Human milk (DHM) and practice changes

In the last decade, the use of DHM has become the standard of care for VLBW (<1500 g) infants when MOM is not available.

DHM banks have been established throughout the world

Haiden et al. 2016

Countries with milk banks	Number of milk banks established	Number of milk banks planned
Europe		
25 countries	206	14
Asia		
India	22	Many
China	12	?
Kuwait	1	–
Philippines	6	?
Malaysia	–	1
Singapore	–	1
Vietnam	–	1 (about to open)
Taiwan	1	
Thailand	1	
Iran	1	
Australia		
Australia	4	1
New Zealand	1	
Africa*		
Others	3	?
Cape Verde	1	
South Africa	approx. 60	
Cameroon	6	?
USA and Canada	26	?
South America		
9 countries	258	?
Central America including Caribbean Islands		
Mexico	17	?
Others	28	?

Milk bank

A non-profit structure organized for

- ✓ Recruitment and screening of breast milk donors,
- ✓ Collection of donated human milk,
- ✓ Pasteurization human milk & storage human milk
- ✓ Bacteriological screening
- ✓ Distribution the human milk.
- ✓ Promotion/support breastfeeding in preterm infants

Donors

Mothers, screened for health problems, giving their extra-milk for vulnerable hospitalized babies, under medical prescription.

Altruistic and generous act based on the comprehension of benefits of human milk for preterm

Not mothers who give (or sell) their extra-milk to mothers who delivered a well-being term baby or to companies which sell HM-based products.

Milk banks

are the most institutionalized method

of milk sharing,

and probably the safest,

but different countries run them very differently.

Brazilian model



Since the 1930s

The largest network of breast milk donors in the world

217 milk banks, and 126 milk collection points

Regulated by public health law that stipulates

all the steps required to operate a bank

- ✓ Collection, testing, pasteurization, and distribution of milk.
- ✓ Training programs for community peer counselors who promote and support breastfeeding

No payment for donations

FIOCRUZ statistics 2016

Collected (L)	Distributed (L)	Donors (n)	Receivers (n)
183.025 L	135.397 L	171.967	166.062

Brazilian model

Centrally organized system, well integrated into the country's public health system

- ✓ At least **1 bank in each of the 26 states**

A reference bank per state

- ✓ A **national reference bank** at FIOCRUZ Institute in Rio de Janeiro

➔ continuous monitoring of the whole system

- ✓ An **online portal (RedeBLH)**

➔ data collection

➔ information for the public and the government

- ✓ **FIOCRUZ Institute**

➔ newsletter, research, undergraduate and graduate programs on policy and applied methodologies for milk banking



*National Day of
Human Milk Donation*

Brazilian model

Donated milk is used for infants

- ✓ whose mothers are sick or unable to breastfeed
- ✓ in neonatal intensive care units

Since 1985, Brazil has normalized breastfeeding through its national public awareness campaigns and breast milk donation programs.

Since 1985, ↓ Brazil's infant mortality rate by more than two-thirds
63 → 20 deaths per 1,000 births.



European model

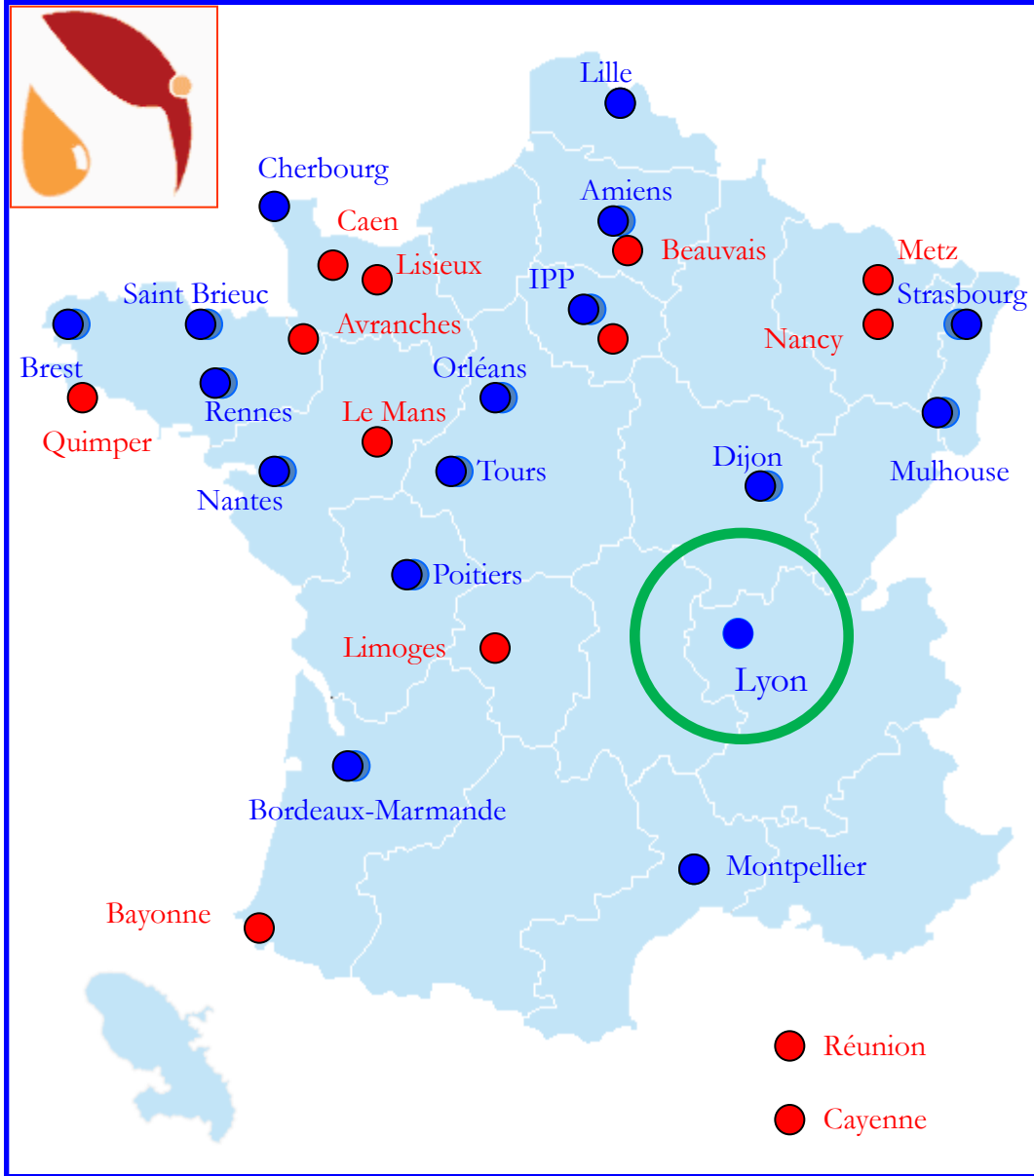


214 Active Milk Banks

17 Planned Milk Banks



France



36 HM banks

- 17 HM banks Int & Ext

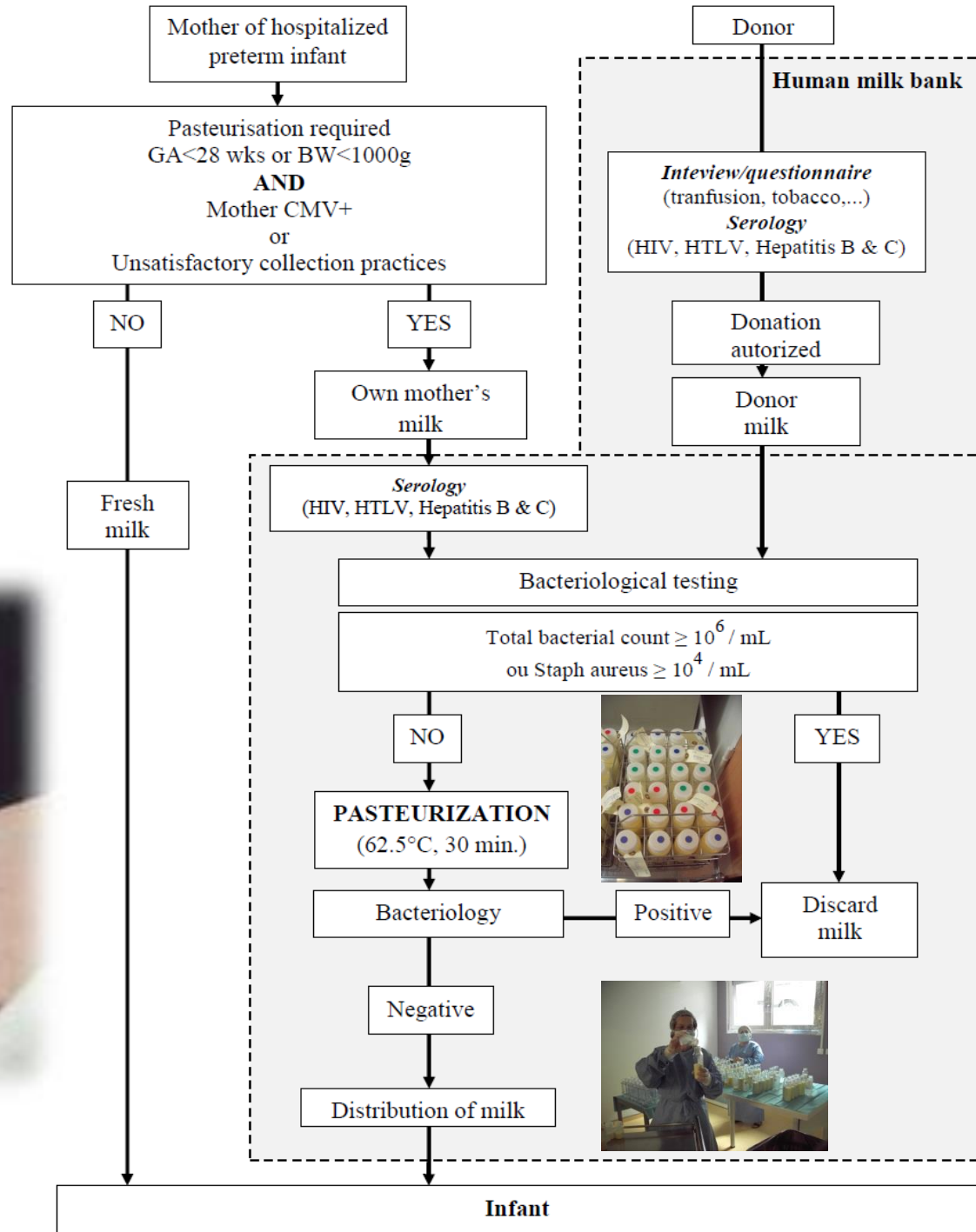
- 19 HM banks Int

Donor HM

OMM

76,818 L collected in 2016

Human milk banks integrated in the newborn care to support feeding of preterm infant with human milk



Human milk banks in Europe

Same objective: provide safe, high-quality donor milk, high-performing HMB, with **high-level quality assurance and tracking** are required.

Universal **common core practices** are required, but there are not yet enough evidence for each practice, which leaves the field open to heterogeneity.

More and more work is done in HMB associations to elaborate **consensus statements based on evidence, otherwise on experience**

- ✓ *France (AFSSAPS 2008)*
- ✓ *United Kingdom (UKAMB 2010)*
- ✓ *Italy (Arslanoglu 2010)*
- ✓ *Switzerland (Frischknecht 2010)*
- ✓ *Norway (Grøvslien 2009)*
- ✓ *Sweden (Milknet 2011)*



- *Australia (Hartmann 2007)*



- *South Africa (HMBSA 2011)*



- *North-America (HMBNA 2013)*



See G Weaver

Norwegian model



No systematic pasteurization of donated milk

Possible and reasonable because

- ❖ The demand can be met due to very high breastfeeding rates, even with extremely strict donor screening
- ❖ Perfect tracing of milk from donor to consumer.
- ❖ Small population (4.5 million), high standard of living (frequent retesting), very low HIV and hepatitis rates
- ❖ Extremely rigorous and regularly repeated testing of donors.

Every 3 months : HIV, Hep. B&C, HTLV 1 &2

Pasteurization of HM for ELBW in one bank to prevent CMV- transmission (40-50% of lactating women)

Pasteurization of samples (10%) containing pathogens (staph. aureus, klebsiella-, enterobacter- and serratia-species or E. coli) or high bacterial counts ($\geq 10^5$ cfu/mL)

Norwegian model



Unlike in most countries, Norway ensures that mothers don't face economic burdens from donating their milk.

In Oslo, the bank at Rikshospitalet University Hospital pays donors about 20 USD per liter (57 cts/oz) to cover expenses (parking fees, ...) and offers the use of hospital-grade pumps.

All infants who may need donated milk are provided it free of charge.

Development of HM banks

Russia

First donor human milk bank opened in the Scientific Centre of Children's Health in Moscow, in 2014.

Lithuania

First donor human milk bank opened in the Lithuanian University of Health Sciences Kaunas Clinics, in November 2016



<http://europeanmilkbanking.com/>



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EMBA International Milk Banking Congress - 5th to 6th October 2017

Please save the dates to be sure you can attend the 2017 EMBA Congress in the historic city of Glasgow in Scotland.

EMBA Congress 2017 website is live for abstract submissions and delegate bookings. [Click the link below for details.](#)

Asia

India

5 million babies annually.

22 human milk banks

Increasing access to donor human milk

but not adequate to meet the massive needs



Taiwan

First milk bank opened in 2005

Chang et al. Characteristics of the First Human Milk Bank in Taiwan.

Pediatr Neonat 2013



Japan

Raw milk for preterm infants

Only one experimental human milk bank in Tokyo

Japanese Human Milk Banking Association in May 2017.



Human milk banks worldwide: practices

To provide safe, high-quality donor milk, high-performing HMB, with **high-level quality assurance and tracking** are required.

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- ✓ *North-America (HMBNA 2013)*

In many countries, milk banking is still quite limited due to

- a lack of political will
- A lack of confidence in the health system in populations with high rates of infectious disease
- Cultural and/or religious concerns

Human milk banking in muslim populations

Milk Kinship and matrimonial prohibition

Religious and **cultural** importance of breastfeeding in Muslim countries.

- Islam attaches legal importance of breastfeeding as a means of establishing a **kinship** ("milk kinship"), which prevents marriage between individuals.
 - The legal theory of milk kinship finds its roots in the Qur'an (*An-Nisā' 23*) : *“Prohibited to you (for marriage) are your milk mothers who nursed you and your sisters through nursing”* (Qur'an: *An-Nisā' 23*)
- In Christianity, breastfeeding also creates milk siblingship in some cultural settings: Coptes egypt (culture>religion)

Human milk banking in muslim populations

In Malaysia, religious leaders prefer to call it 'milk sharing', transpiring more the human touch and human values than the term 'bank'.

Few proposals :

- Limit the donor should be limited to a very strict minimum (preferably only one donor per child)
- No mixing of donor's milk
- Adequate labeling of all samples (full identification of the donor)
- Disclosure of the identity of the donor to the recipient's family
- Identity of the donors attached to the child's birth certificate
- Mothers should try to get their own milk production started as soon as possible, to limit the number of donors.
- If some donor mother have only (or mainly) children of one sex, the milk could be preferably reserved for recipients of the same sex.

Human milk banking in muslim populations

REVIEW ARTICLE

Acta Paediatrica 2016

Milk kinship is not an obstacle to using donor human milk to feed preterm infants in Muslim countries

Aliaa Khalil^{1,2,3}, Rachel Buffin^{1,2}, Damien Sanlaville^{4,5}, Jean-Charles Picaud (jean-charles.picaud@chu-lyon.fr)^{1,2,5}

Table 1 Practical suggestions for successfully establishing human milk banks in Muslim communities

- All the donor human milk received by the bank should undergo a pasteurisation process.
- The indications for donor human milk should be restricted to high-risk newborn infants who would benefit the most from human milk, for example preterm infants with a birth weight below 2000 g.
- A single-donor policy could be associated with a very well-organised, traceable system to ensure that the donor and the recipient know each other.
- When the policy is to use multiple donors, the milk from at least three donors should be mixed, which requires a sufficient number of donors as well as a well-organised human milk bank.

Other suggestions:

- Milk banks should perform systematic lyophilisation of donor human milk, but this is expensive and complex.
- They should also provide a maximum of five feedings sessions with milk from the same donor, but this may not be practical.

Human milk banking in muslim populations

Donor human milk for Muslim infants in the UK *Arch Dis Child F & N 2016*

T C Williams,¹ M Z Butt,² S M Mohinuddin,^{3,4} A L Ogilvy-Stuart,⁵
M Clarke,⁶ G A Weaver,⁷ M S Shafi²

Roundtable discussion between

- ✓ Representatives of the patients: Muslim Council of Britain
- ✓ Clinicians: British Association of Perinatal Medicine
- ✓ The religious community: Muslim chaplains
- ✓ Providers of DHM: UK Association for Milk Banking
- ✓ An expert in Islamic Bioethics (MC)

➔ Need for a robust system to ensure the traceability of donated milk.

➔ Milk Bank able to give a binary answer (yes/no) (maintain anonymity of other donors), when a potential bride or groom had received DHM as an infant

Human milk banking in muslim populations

Cultural and religious complexities around donor milk

In **Turkey**, recent survey of Turkish women (Gürol 2014)

- ✓ 90% never previously heard of the concept of breast milk banking,
- ✓ 36% had problems of a religious nature with the idea
- ✓ 29% think it would lead to social and moral problems

➔ Alternative milk banking model compatible with Islamic beliefs

was set up in 2013, but still awaits final legal approval from the

Ministry of Health. Details of the donation recorded electronically.

Gürol, A. et al..

Turkish women's knowledge and views regarding mother's milk banking. Collegian 2014

Human milk banking in muslim populations

Creating religiously compliant milk banks in the Muslim world: a commentary
Alnakshabandi et al Paediatr Intern Child Health 2015
(Saudi Arabia)

Conditional Identified Milk Banking System (CIMBS)

- ✓ Both the donor's and recipient's identities are accessible to all parties through a voluntary registry
- ✓ The milk-pooling is limited to three milk donors.

A survey suggest that there could be receptivity among practicing Muslims and religious leaders to this alternative approach

Breastmilk: a valuable product

In Brazil, prior to 1985, breast milk was bought and sold, incentivizing impoverished mothers to sell excess amounts of breast milk, often to the point at which they were unable to provide for their own infants!

Nowadays, it is still a “highly sought-after material” for some persons

❖ Milk from other mothers from the same country or around

Aim: Milk sharing (term infants from mothers lacking milk)

Risks: Contamination with micro-organisms, or cow milk

❖ Milk collected in underprivileged areas where selling milk represents a significant income for mothers

Aim: To make human milk-based products (fortifiers, ...)

Risks: Inability to provide for their own infants

Increased infant’s mortality and morbidity

Microbial contamination of human milk purchased via the internet.

Keim SA, et al. *Pediatrics* 2013

74% positive for Gram negative bacteria

21% positive for cytomegalovirus

→ severe sepsis, NEC

Cow's milk contamination of human milk purchased via the internet.

Keim SA, et al. *Pediatrics* 2015

10% of Internet samples,

→ milk allergies and intolerances

Retrospective review of serological testing of potential human milk donors. Cohen RS, et al. *Arch Dis Child F&N* 2010

3.3% screened positive for various sexually transmitted diseases (HIV, hepatitis B or C, papillomavirus, ...)

→ **A Call for FDA Regulation of Human Milk Sharing.**

Eisenhauer L. *J Hum Lact* 2016



AMBROSIA MILK: SAFE, TESTED, PURE

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A close-up photograph of a woman with long dark hair smiling warmly while holding a young child. The child is also smiling and looking towards the camera. The background is softly blurred, suggesting an outdoor setting with greenery.

**HIGH QUALITY MILK
STARTS WITH HEALTHY
DONORS**

[BUY NOW](#)

Our Donors

At Ambrosia Milk we are focused on mothers and babies on both the donating and receiving ends of the equation. Our donors are **healthy mothers around the world with excess milk and infants at least six months old**. They come to our centers to donate with the help of our carefully trained staff.

To make sure our donors and their children stay healthy, we provide them with medical check-ups and blood tests. In addition to the health benefits we provide our donors, we are committed to empowering them for the long term.

Breastfeeding is hard work and women should have the option to be recognized financially for the valuable milk that they can provide.

Cambodia bans export of human breast milk after US operation raises concern

(March 22, 2017)

theguardian

Cambodia halted breast milk exports by the Utah-based Ambrosia Labs, a company that source the product from overseas and distribute it in USA. Unicef (UN) welcomed the ban, saying the trade was exploitative and that excess breast milk should remain in Cambodia, where many babies lack proper nutrition.



*Women often had no other choices and were turning to the controversial trade to **boost meagre incomes** in one of south-east Asia's poorest countries. The milk was pumped by poor Cambodian women in Phnom Penh, and then shipped to the US, where it was pasteurised and sold for **\$20 per 5oz (147ml) pack** (= \$136/L, Note: France: legal price \$91/L)*

CONCLUSION



There are important differences that need to be taken into account to enable milk banking to work in different countries.

Some of these differences are already known

In many places, reliable information is lacking “as much as donor milk”

Need for surveys to learn from women and doctors how to improve existing systems.

Part of a global supportive breastfeeding policy (political will, cultural acceptance)

CONCLUSION



Human milk banks can contribute to develop

❖ an integrated system for providing **optimal newborn care**, together with

- ✓ kangaroo mother care (skin-to-skin contact),
- ✓ rooming-in,
- ✓ respect of the WHO/UNICEF Ten Steps to Successful Breastfeeding expanded in 2011 for use in NICUs (Nyqvist 2013).

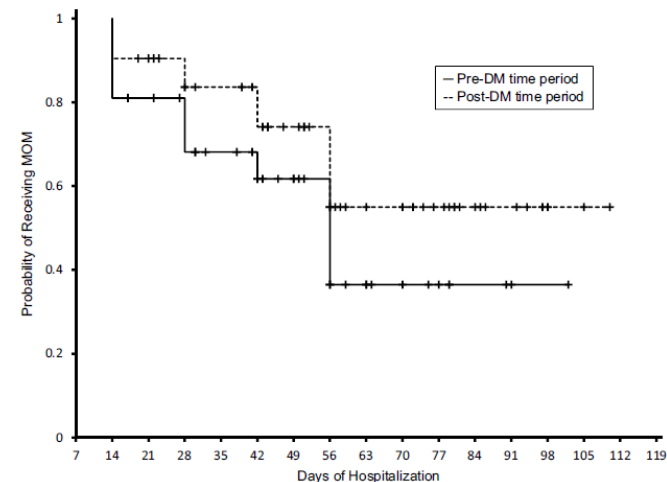
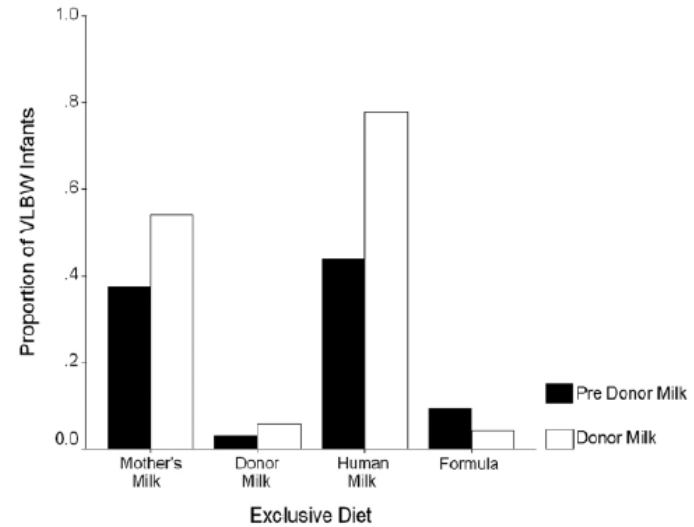
❖ a strategy aiming to **provide human milk to most of preterm babies** together with

- ✓ hospital-based lactation program
- ✓ “HM management centers” (Spatz 2014) or “Mother’s own milk bank” (Hurst 1998) to provide preterm infants with own mother’s milk
- ✓ mother/baby centers for donor milk donation and lactation support as proposed in Brazil (Rea 1990)

Human milk banks and breastfeeding rates

The presence of a HMB or implementation of donor milk policy improves:

- ✓ Exposure to HM **during hospitalization** VLBW in 1 NICU (Hartford, USA) (*Marinelli 2014*)
- ✓ Breastfeeding rates **at discharge** from NICU
 - *Arslanoglu 2013*: VLBW in 83 Italian NICUs
 - Exclusive BF **16%** in NICUs without HMB
 - Vs **31%** in NICUs with HMB
 - *Parker 2016*: BW ≤ 1500 g in level 3 NICU (Boston)
 - MOM at discharge **43%** before DM program
 - Vs **65%** after implementation of DM program



Human milk banks: donors

