HUMAN MILK BANKING IN ITALY

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Scientific Director
Italian Association of Human Milk Banks

Milan, Italy
Donor Human Milk Bank

A service with the purpose of

- selecting
- collecting
- screening
- storing and
- distributing

donated human milk to meet the specific needs of individuals for whom HM is prescribed by health care providers.
• The origins of donor milk banking go back to earlier times when children were breast fed by friends, relatives or strangers - a practice referred to as "wet nursing".

• Evidence of the support for "wet nursing" is already present in the Code of Hammurabi.
The Code of Hammurabi

• Is a well-preserved Babylonian law code, dating to 1780 BC.
• The sixth Babylonian king, Hammurabi, enacted the code, and partial copies exist on a human-sized stone stele and various clay tablets.
• It is one of the oldest deciphered writings of significant length in the world.
In those days, children were thought to inherit the physical, mental and emotional traits of their wet nurse through the breast milk so selection of the nurse was felt to be very important.

Wet nurses are described and include rules for wet nursing

One of the rules stated that if a wet nurse had been feeding an infant who died for any reason, she was prohibited from taking on another infant to wet nurse.
Later on, European women made more money working as wet nurses than any other occupation open to women.
Transition from wet nursing to milk banking began in the early 1900’s
## HISTORY OF HUMAN MILK BANKING

### WORLD

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
<th>Event</th>
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<tbody>
<tr>
<td>1909</td>
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### ITALY

- 1948 Amsterd Moedermelk Centrale
The first HMB in Vienna, 1909

- **Theodor Escherich (1857–1911)**  
  Chair of Pediatrics (1902-1911) at the University of Vienna  
  Director of the St. Anna Childrens Hospital

- Indicated that the intestinal bacteria of the breast fed neonate was significantly different from infants fed in other ways (life saving properties of HM).

- His efforts resulted in eventual construction of the Imperial Institute for Maternal and Infant Care and the first HMB.
The second HMB in Boston, 1910
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✦ ITALY

1965  1st HMB in Italy
1970-1985  Five HM banks
1985  Milan Human Milk Bank
The First 5 Banks in Italy 1965-1985

Where it is not possible for the biological mother to breastfeed, the first alternative, if available, should be the use of human milk from other sources. Human milk banks should be made available in appropriate situations.
American Academy of Pediatrics
Working Group on Breastfeeding

- Human milk is the preferred feeding for all infants, including premature and sick newborns, with rare exceptions.

- When direct breastfeeding is not possible, expressed human milk, fortified when necessary for the premature infant, should be provided.
HUMAN MILK BANK OF MILAN - MMMH

1985 - 2010

A Profitable Investment for Infants' Future
Human Milk Bank of Milan

- Founded in November 1985
- In 25 years of activity (1985-2010): collected 27,000 lt of HM (≈ 1,100 liters/year)
- In 2010: collected 1,671 lt of HM from 203 donors (126 int and 77 ext)
- 700 liters (42%) donated to other hospitals and external infants
Indications for using banked human milk

1. Feeding preterm infants

2. Term infants: Before initiation of lactation
Other Indications

- Allergies
- Formula intolerance
- Failure to thrive
- Postoperative nutrition
- Renal failure
- Inborn errors of metabolism
- Multiple births
- Immunological deficiencies
Human Milk Bank of Milan

- home collection of human milk (HM)
- electrical breast pumps provided at home
- quick macronutrient determinations by infrared analysis
- separation of HM fractions
- protein lyophilization and vacuum-pack storage
- HM supplementation with HM protein
- storage of HM according to protein content
Donor breastmilk: So precious we keep it in a bank
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2007 Revision of Guidelines
   3° National Survey
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   J Maternal Fetal Neonatal Med
2000: 1st Survey on Human Milk Banks in Italy
HUMAN MILK BANKS IN ITALY

Linee Guida
per la costituzione
e l'organizzazione di una
Banca del Latte Umano Donato

Giuseppe De Nisi
Amalia Maria Ambruzzi
Enrico Bertino
Gianpaolo Donzelli
Guido Moro
Fabio Pederzini
Claudio Profeti
Maria Rita Sprechini
Paola Tonetto
2005: 2\textsuperscript{nd} Survey on Human Milk Banks in Italy
HUMAN MILK BANKS (HMB) IN ITALY

2005

AFTER GUIDELINES

NEW HMB
- BARI
- CROTONE
- FOGGIA
- GROSSETO
- TREVISO
- VERSILIA

n.24
2005

Impact of the GL

- Six new HM banks
- Increase in external donors
- Introduction of HACCP
- Diffusion of breast pumps
- Uniforming the milk processing and handling pasteurization (Holder -probe) storage (allarms, glass/polypropylen) thawing
• **HACCP** ⇒ Hazard Analysis Critical Control Points: a system utilized to control food production to assure the safety of the consumer

• **CCP** ⇒ Critical Control Points: they identify the critical phases of the processing, where a particular risk attention is required

• **GMP** ⇒ Good Manufacturing Practices: they identify the phases of the processing where critical points are not present, but the control is necessary
Donor selection

C C P

Milk donation G M

Equipment for milk expression

Collection at home

Collection in hospital

Collection by the Bank

Freezing at home

Freezing

Disinfection of the equipment

Monouse milk bottles

Transportation to the Bank

G M P

Transportation to the Bank

G M P

Delivery of the milk

G M P

Acceptance of the milk

G M P

Acceptance of the milk

Thawing

G M P

Pasteurization

C C P

Freezing and Storage

C C P

Bottling

Liquid milk

G M P

Distribution

G M P

Bottling

Frozen milk

G M P

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Frozen milk

G M P
2007 - 3\textsuperscript{rd} Survey on Human Milk Banks in Italy
Survey on Human Milk Banks in Italy - June 2007

26 Human Milk Banks:

- 26 centers answered (100%)
- 23 centers filled the questionnaire
- 3 centers were not working anymore
Survey among Italian Human Milk Banks: Questionnaire

1. Collection of “mother’s” and of “donor’s” milk
2. Only “internal” or also “external” donors
3. Service for home milk collection
4. Volume of milk collected in the last 2 years
5. Number of donors in the last 2 years
6. Space and staff
7. System of collection and delivery to the bank
8. Frequency of bacteriological tests on the milk
9. Technique of pasteurization
10. Temperature and duration of storage
11. Modality of storage: GA, PA, other
12. Modality of thawing
13. Equipment (pump, freezer, pasteuriser)
14. Type of container
15. Type of sterilization for material
16. Impact of the Guidelines on the Ba
3. Home collection service
(23 centers)

- yes : 14  (60.9 %)
- no : 9  (39.1 %)
4. Volume of milk collected (n=21) (no registration in 2 centers)

- 12.706 L in 1 year
- mean : 605 L/bank
- range : 10 - 2.389 L
# 4. Volume of milk collected (21 centers)

<table>
<thead>
<tr>
<th>Volume (liters)</th>
<th>N. of Centers</th>
<th>% of 21</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 1000</td>
<td>5</td>
<td>23.8</td>
</tr>
<tr>
<td>500-1000</td>
<td>3</td>
<td>14.3</td>
</tr>
<tr>
<td>350 - 500</td>
<td>2</td>
<td>9.5</td>
</tr>
<tr>
<td>&lt; 350 *</td>
<td>11</td>
<td>52.4</td>
</tr>
</tbody>
</table>

* 4 centers (19%) collected less than 50 liters in 1 year
5. Number of donors
21 banks
(no registration in 2 centers)

- 1,261 in 1 year
- mean: 60/bank
- range: 1.5 - 319
Pasteurisation of donor breastmilk

62.5°C for 30 minutes

Keep hard copy of the record of heat treatment with the records of each batch treated
## Similarities / Differences among the Italian HMB

### Similarities
- Collection and delivery
- Pasteurisation technique
- Storage: temperature, duration, modality

### Differences
- Volumes of milks
- Bacteriological test
- Modality of thawing
- Number of donors
- Type of pasteuriser
- Type of containers
- Costs
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Guidelines for the Establishment and Operation of a Donor Human Milk Bank

Guest Editors: Sertac Arslanoglu and Guido E. Moro
HUMAN MILK BANKING IN ITALY:
TWENTY-SIX MILK BANKS IN 2010

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16 October 2010

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Planned Human Donor Banks

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Germany
Greece
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Portugal
Slovenia
Spain
Turkey

Donor breastmilk: So precious we keep it in a bank
Thank you for your attention!